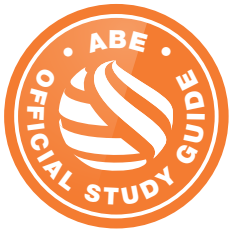
Your road to success

LEVEL 5 ANALYTICAL DECISION-MAKING



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Contents

Using your study guide

Welcome to the study guide **Level 5 Analytical Decision-Making**, designed to support those completing an 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 developed
Element 1: Role of analytics in decision-making in contemporary dynamic business environments	• Demonstrating knowledge and understanding of the concepts of business decision-making and the role of analytics to support effective decision-making in a variety of organisational contexts • Evaluating the nature, scope and impact of routine, operational and strategic decision-making in response to identified issues and problems • Initiating decision-making with consideration for contemporary and emerging themes in a dynamic business environment *Commercial and business understanding, assimilation of complex and diverse knowledge and data, appraisal in context, problem solving*
Element 2: Source and use of data, systems and technologies for relevant decision-making	• Understanding and managing research methodology and systems for periodic and continuous data retrieval for routine and non-routine purposes to meet client and organisational requirements, meeting ethical and legal standards • Identifying, sourcing and accessing information using technologies and a multiplicity of data sets in complex contexts *Business research skills, quantitative methods, organisational skills, technology and software applications*
Element 3: Analytics in practice: analysis synthesis, evaluation, and reporting of data to meet requirements and the needs of a specific brief	• Analysing, interpreting, and evaluating complex data sets from a range of internal, competitive and external sources • Using a variety of techniques and models to evaluate data including qualitative/quantitative data, comparative studies, and trend and forecast extrapolation in a variety of contexts • Reflecting on risk factors including access to reliable data, which can lead to anomalies and misinterpretation allowing for realistic margin of error *High levels of analytical, interpretive and evaluative skills, objectivity, logical thinking, communication, business reporting, language and presentation skills, responsiveness, sensitivity to audience*
Element 4: Option development in analytical decision-making	• Evaluating options for decision-making through modelling techniques and scenario development with consideration for organisational culture and contexts • Mapping and testing the likelihood of success considering risk and other factors • Reporting and providing justifiable recommendations to enable decision-making *Lateral thinking for problem solving, skills in scenario planning to aid forecasting, logical argument, testing, decision-making, communication of ideas and justified argument*

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

L5 descriptor

Knowledge descriptor (the holder…)	Skills descriptor (the holder can…)
• Has practical, theoretical or technical knowledge and understanding of a subject or field of work to address problems that are well defined but complex and non-routine. • Can analyse, interpret and evaluate relevant information and ideas. • Is aware of the nature of approximate scope of the area of study or work. • Has an informed awareness of different perspectives or approaches within the area of study or work.	• Identify, adapt and use appropriate cognitive and practical skills to inform actions and address problems that are complex and non-routine while normally fairly well-defined. • Review the effectiveness and appropriateness of methods, actions and results.

Contained within the chapters of the study guide are a number of features which we hope will 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.

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

Highlighted words throughout and **glossary terms** at the end of the book.

Note

Website addresses current as of June 2017.

Chapter 1

Role of Analytics in Business Decision-making

Introduction

> *Unless commitment is made, there are only promises and hopes... but no plans.*
>
> *Peter Drucker 1909-2005*

Sustained and effective decision-making in business lies at the heart of any enterprise's long-term success. In diverse and complex organisations – often spanning international boundaries – decisions are made **24/7**, at every level of the organisation: strategic, managerial and operational. If mishandled, even the most mundane decision can have a major impact.

Analytical skills that justify both operational and strategic decisions have become essential ingredients in a manager's armoury. This chapter focuses on the role of analytical decision-making in contemporary **dynamic business environments**, considering how new technologies and work practices are affecting organisational **decision-making** activities.

Learning outcome

On completing this chapter, you will be able to:

1 Examine the role of analytics in decision-making in contemporary dynamic business environments.

Assessment criteria

1 Examine the role of analytics in decision-making in contemporary dynamic business environments.

1.1 Demonstrate knowledge and understanding of the concepts of appropriate decision-making.

1.2 Evaluate the nature, scope and impact of routine/non-routine, operational and strategic decision-making in response to identified issues and problems.

1.3 Discuss the nature of analytics to support business decision-making.

1.4 Assess analytical decision-making, considering contemporary and **emerging themes** in a **dynamic** business environment.

1.1 Concepts of appropriate decision-making

Trewatha and Newport (1982) considered decision-making as a process: "Decision-making involves the selection of a course of action from among two or more possible alternatives in order to arrive at a solution for a given problem." Likewise, the *Business Dictionary* defines it as: "The thought process of selecting a logical choice from the available options."

Decisions are made continuously by every staff member and at every level in the organisation within the parameters of a specific job role or responsibility. Although the nature of decisions differs, the necessity to involve other departments and the complexity in achieving the desired outcome determines who is involved in the decision-making process. Certainly, within the business context, decision-making at most levels of a **corporate** organisation is a principal function of management – a conscious act often involving one or more teams, which is derived from analysis of known facts and then the development of options from which choices can be made.

Within these contexts, the more strategic the decision, the greater the need to justify not only the basis on which the decision is made, but also the roles of those involved, and transparency of the process undertaken. Thus decision-making in corporate bodies is generally perceived to be rational but often slow and process-driven, determined by and dependent on organisational policies, procedures and interventions by committees or boards. The need for compliance with the rules of corporate governance and stakeholder management are developing facets of decision-making for executives and managers in the corporate world. In crisis management, major difficulties are often encountered when adherence to procedure leads to delayed, untimely and ineffectual decision-making results.

In contrast, entrepreneurial decisions, especially those about which there is little or no current or relevant information available on which to develop options and base decisions, are often made instinctively on the "gut" feeling or intuition of a senior executive/entrepreneur. Though responsive to circumstances or even pro-active and "**cutting-edge**", these may be perceived to have been made with little thought, consideration of alternatives or reference to others' opinions. However, even these decisions will be founded on evaluation of knowledge, experience and success of the entrepreneurial decision-maker.

Nature and types of decision-making

The nature and scope of decision-making will be determined generally by the level within the organisation at which the decisions have to be taken. Table 1 below indicates the types of decisions undertaken by staff operating within the organisational hierarchy with a complementary example.

Level	Scope/impact of decision	Decision-maker/s	Nature	Term/time span	Example
Strategic	Corporate/ major	CEO/senior director	Singular/ ambiguous	Long-term (five years+)	Subsidiary acquisition or disposal
	Corporate/ major	Board directors	Repeat/ regular	Short (less than one year) and medium (one–two years)	Organisational involvement in community **corporate and social responsibility** activities
Managerial	Organisational/ procedural improvement	IS manager and departmental managers	Singular/ complex	Medium	Project: a new integrated information system
	Departmental/ routine	Manager/team leaders	Repeat/ simple	Short	New procedures for reporting sales data
Operational	Team and individual/ routine	The team	Repeat/ simple	Short	New rota for staffing

Table 1: Levels of decision-making

It can be concluded that the senior leadership team (SLT), comprising the chief executive officer (CEO) and board of directors will generally be making the strategic decisions for the organisation, which are long-term decisions with a significant impact. If there is failure as a result of those decisions, it is usual for senior executives involved in the final decision-making process to be held responsible for the failure, even though culpability might come from external and unforeseen circumstances, or even poor execution of the decision rather than the decision itself.

Moving down the hierarchy of decision-making, as the nature, longevity and span of the decision-making reduces, so too does the more obvious impact of the decisions made. Effective managerial decisions which affect the overall operational efficiency of the organisation will have widespread implications for multiple teams, and may require complex negotiations with other departments or even "external" organisations, such as trade unions. Even at operational level, repeated poor decision-making in action will have a long-term impact and lead to both poor performance and poor reputation with an associated decline in profits.

OVER TO YOU

Activity 1: Decision-making responsibilities

Using Table 1 as a guide, determine which category of decision would be required to handle the following scenarios:

1. **A major product recall is required due to safety concerns.**
2. **In a call centre, a team member is taken seriously ill and requires urgent treatment.**
3. **A new customer relationship management system has been installed.**
4. **Due to a rise in interest rates and a fall in the local exchange rates, imported components are becoming more expensive and profits are at risk.**

Develop your answers by making notes.

Additional questions

What would the impact be on the organisation and who should be involved in the decision-making process?

Are these problem-solving decisions or ones based on planning?

What decisions should be considered in these cases?

Decision-making in context

Approaches to decision-making are defined by the ownership, management and leadership of the organisation, which is affected by both purpose and context as well as embedded cultural parameters derived from external and internal influences. For example:

- history and ownership
- organisational "business" (business context) and technology
- goals and objectives
- size and organisational structure (for example, an international **conglomerate** will have very different approaches from that of a **small to medium-sized enterprise (SME)**)
- location (including international/geographic factors).

Organisational purpose and context

Organisations may be defined by their purpose, goals and objectives. These determine the methods used to arrive at decisions. Broadly falling into two categories, the purpose (or raison d'être) of the organisation may either be to make profit for owners/**shareholders** (a commercial entity) or to provide a service to the community paid for by taxation (public sector) or donation (charity or not-for-profit).

There is a perception that commercial enterprises are likely to be more flexible and agile than the public sector when making business decisions, or those answerable to a wider community. Whilst this does hold true, it should be pointed out that increased regulation, governance transparency and ethical expectations can render the commercial corporate risk averse and as procedurally driven in decision-making as its public sector counterparts.

Another influencing factor may be the sector in which the organisation operates. Simply, these fall into three historically defined categories, as indicated in Table 2.

Classification	Sector examples
Primary	**Extractive** Agriculture
Secondary	Manufacturing Processing Assembly
Tertiary	Retail **Distribution** Services

Table 2: Sector classifications

In this context, resource investment in industries operating in the primary classification will be significantly greater and require a longer term view than, for example, the tertiary service sector, which is likely to necessitate lower investment and a more dynamic approach to change.

Technology and other emerging trends will also force both the pace and nature of change, impacting on the approach to and speed at which decisions are made.

OVER TO YOU

Activity 2: Strategic decisions in context

Make a note of the types of strategic decisions made by the following organisations. Give example decisions of each:

Commercial	Public sector	Not–for–profit
Exxon Mobil	United Nations	Oxfam
Apple Inc.	Indian National Government	MSF (Medécins Sans Frontière)
Uniqlo	Local education service	Traidcraft

The internal context

> *"Business organisational structures came about to simplify decision-making."*
>
> *Victoria Duff*

Organisational structures evolved from division of work, grouping of activities and the necessity of organising managers to oversee these activities.

Blackenship and Miles (1968) said managerial decision-making was linked to the relationship between hierarchical position, size and span of control and dimensions of managerial decision-making. This included a perceived influence on superiors, reliance on subordinates and (the manager's perceived) influence on the final choice.

Size factors may determine whether an organisation opts for a **centralised** or **decentralised** structure. Centralisation has advantages – decisions are generally speedier and considered to be more decisive, and less likely to be subject to compromise because of "**diffused authority**" (Mullins 1999). However, the greater the size of the organisation, with sub-units, a variety of activities and multiple (international) locations, the greater there is need for decentralisation. This has advantages when decisions are made at operational level, with general responsiveness to emergent or local issues.

Organisational **charts** provide a useful insight into the likely relationship (and communication) paths between departments and divisions, and the managerial **capability** to make decisions. Tall structures (hierarchical) are perceived to lead to a narrow focus for decisions, whereas a flat

structure tends to encourage greater communication. Although a greater span of responsibility by managers equally may lead to a lack of control, Mullins discusses these in terms of individual authority relationships, based on:

- line (management);
- **functional** activities (such as marketing, human resources, operations, finance, **procurement** and operations. These are discussed in more detail in Chapter 2);
- staff relationships by role;
- lateral relationships between different departments or specific groupings, such as quality circles, have led to a form of democratic or participative management. The case of Semco (summarised below) is a well-known example of organisational decision-making, developed through a structure based on lateral relationships (concentric circles) rather than the traditional hierarchy.

Clearly, empowered authority and structures have an important role to play in decision-making and the decision-making processes. In later sections, we will be exploring decision-making based on the functional activities of an organisation.

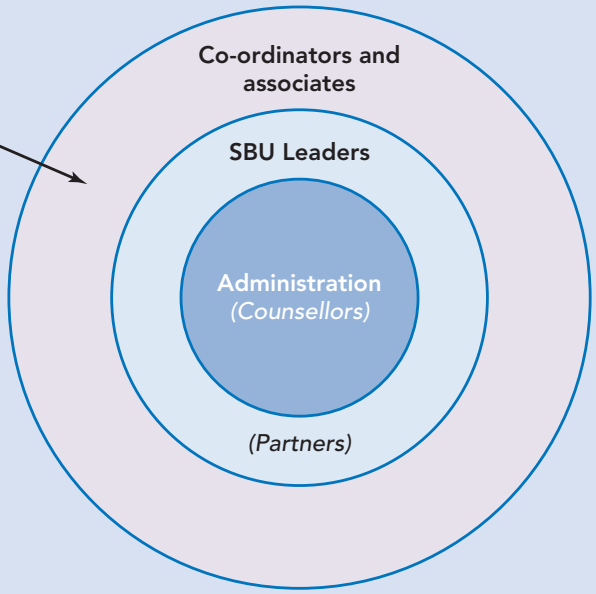
CASE STUDY: SEMCO

The subsidiarity principle

SEMCO

Semco's organisational design is structured in three concentric circles: administration (**counsellors**), leaders of business units (**partners**) and everyone else (**associates**).

Each business unit (SBU) has several **Co-ordinators,** guiding 5-20 **Associates**, Co-ordinators lead, but do not receive higher salaries than when they were associates.



Semco's principle of organisational dynamics is based on democratisation. It is structured on the basis of the subsidiarity principle, in which subordinate groups handle matters of lesser importance that could dissipate the efforts of the leadership, whose role is to watch, direct, urge and, on occasions, restrain. Here is one illustration:

"On the shop floor, in fact, each associate would make all the decisions he felt confident to make by himself. If he was uncertain about a problem, he would consult his coordinator. Similarly, each coordinator would make all the decisions he felt confident to make. He would bring other issues up at a weekly team meeting, presided over by the partner of his business unit. This session would be held Monday morning, after which the coordinators would brief the associates they worked with on the results. Decisions that affected all our business units, such as a company-wide increase, or decisions that one business unit did not think it would make it alone, such as a large investment in new equipment, would be forwarded to another meeting on Tuesday. This would be attended by a representative from each unit (not necessarily the partner), plus all the counsellors. Just three circles, four job categories and two meetings. That's it."

Case study source: R Semler, Maverick, p.192

Culture

If sector, context and organisational structure heavily influence decision-making capability, so too does organisational **culture** – often seen as the backdrop to the organisation and its driver.

Organisational culture has been defined as "the set of shared values and norms that characterise a particular organisation" (FT Lexicon), or more informally, "how we do things round here."

Charles Handy (1999) describes four types of organisational cultures. Each culture, where present, will have a powerful influence and direct impact on approaches to decision-making in any organisation:

1. **Power culture** – based on an individual at the centre of the organisation (often the entrepreneur) from which control is exercised. In this case, decisions are made by an influence that has few rules and procedures.
2. **Role culture** – a bureaucratic environment where decisions are made on the basis of rationality and logic.
3. **Task culture** – a job or project-oriented role where the focus is based on decisions made to achieve specified goals.
4. **Person culture** – in this instance, a culture develops where decisions are made on the basis of the interests of the individuals (or groups of individuals) working within the organisation.

An overriding stimulus to corporate values and decision-making will be the effect of national culture on organisational decision-making. Geert Hofstede undertook extensive studies on behalf of IBM (1967–1973), identifying different national cultures and their impact on organisational behaviour.

OVER TO YOU

Activity 3: Applying decision-making concepts in context

Research an organisation with which you are familiar. Examine the organisational structure and assess what types of culture exist and their approach to decision-making.

How has that impacted on strategic, management and operational decisions?

Evaluate the effectiveness of culture, structure and decision-making on the organisation's performance.

Make notes.

1.2 Nature, scope and impact of routine/non-routine, operational and strategic decision-making

Decision-making processes

The impetus to make purposeful decisions is usually driven by two factors:

- **Planning** – the establishment of goals, policies, procedures and organisation of activities in a systematic and structured way. Possibly a longer-term approach to resolving issues or for the proactive development of an organisation, business unit or specific function of a business.
- **Problem solving** – decisions and actions necessitated as a reactive response to an issue, or even an unexpected/unplanned crisis. The impact from the issue/crisis may lead to a more planned and longer-term decision.

Strategic planning is often seen as a "**top-down**" approach to decision-making, where the corporate senior leadership team "filter" down goals and objectives of the organisation, directing **strategic business units (SBUs)**, management and operational teams to translate these into actionable plans and procedures. This approach tends to lead to a coherent message and suggests a more global decision-making strategy. The alternative – a more "**bottom-up**" approach (see the Semco case study as an example) – is based on decisions being driven by individual business units or the functional teams themselves to inform the corporate body.

The strategic decision-making hierarchy

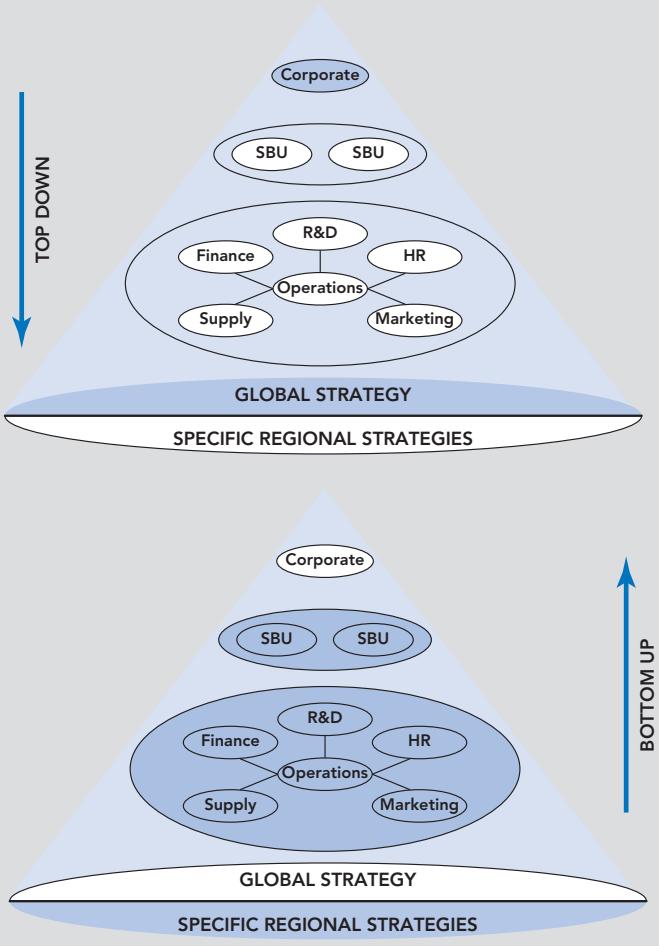


Figure 1: The strategic hierarchy, adapted from Hahn (1991)

The functional activities of the business often reflect the organisational structure; broadly they will be divided into groups of similar specialisms and functions. Each functional area of the business has a major role in optimising performance.

The prime functions of the business fall into five main categories:

- finance
- human resource management
- operations and production
- marketing (and sales)
- procurement.

Other defined categories, dependent on the nature of the business and importance of these activities, may include:

- information systems: management information systems (**MIS**) and information technology (IT)
- research and development.

All functional areas of the business will undertake decision-making as part of their activities at all levels: operational, management and strategic. In the table below, a number of examples are given where decision-making can be regarded as routine or occasional.

Decision-making in business functional areas (examples)

Level/ Function	Finance	HRM	Operations	Marketing	Procurement
Operations	Credit control, receivables and payables, transactions records	Employee induction, absence and holiday records	Staff rota, routine maintenance, day-to-day operations	Marketing communications, copy writing/ press releases, market research	Purchase orders, supplier relations
Management	Budget development, accounts reporting, financial management reports, pricing/ costing	HR policies, management of disciplinary and grievance, career and continual professional development (CPD) management	Production and operations management including quality, process management	Marketing and campaign planning, market intelligence, product and pricing, sales and distribution, channel management	Lead in **decision-making unit (DMU)** and specification development, negotiating supplier contracts for large scale capital procurement
Strategic	Investment and shareholder management, financial and risk management	Change management, collective bargaining, strategic HR developments	Research and development (R&D) and production strategies, business and production systems re-engineering	NPD and market development strategies (including diversification), corporate branding and stakeholder development	Major contract (cost and specification) negotiations, including technology procurement

Table 3: Decision-making in business functional areas (examples)

Cross-organisational decision-making

Where decisions need to be made which impact on more than one department or division, a more coherent approach to coordinating and integrating decisions may be appropriate. In this section, we examine three examples of cross-organisational methodologies which may be appropriate in this context:

- the use of the decision-making unit (often used in sales situations)
- the use of quality circles (shown earlier)
- **Porter's Value Chain.**

Decision-making unit (DMU)

The concept of the decision-making unit (DMU) was developed as a "buying centre" for the purpose of selling products and services. However, this basic structure can also be adapted for use in other aspects of the business, or indeed for the purpose of presenting a proposal or business case from within the organisation.

Decision-making unit

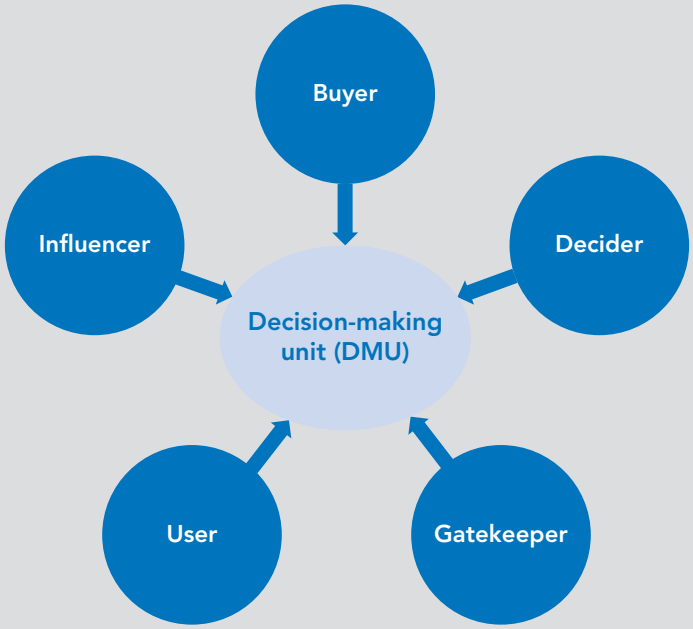


Figure 2: The members of a decision-making unit, adapted from Kotler and Armstrong (2009)

- The **DMU** is made up of a number of roles (rather than individuals).
- **Users** are generally those individuals who will be using the product or service proposed.
- The **influencer** may have a specialist role or expertise to advise on the process or product to be considered. In IT procurement, for example, the IT specialist will heavily influence the acquisition of a system or software, mindful of its impact on the wider organisation.
- **Buyers** are generally the purchasing or procurement specialist who will negotiate final price or terms of purchase.

- The **decider** will be the senior manager who will give the authority to acquire the system or product (i.e. will sign or confirm signatory on the contract).
- The **gatekeeper** will control the flow of information to the key personnel in the DMU.

The Value Chain

Aside from the better known criteria for competitive advantage, differentiation and cost leadership (Porter's generic strategies), sound management of networks and linkages are increasingly perceived as a source of sustainability and improved profit margins. In other words, no organisation can operate either internally or externally in a "silo", or as an island. Porter (1985) expressed this through the "Value Chain", in which he demonstrated that whilst "primary" activities were the drivers of income and profit (margins), the various "support" areas of an organisation had a significant role in facilitating and supporting the decisions of the primary functions. These include the firm's infrastructure, which directs the shaping of organisational direction and senior management and the administrative functions, of which information systems and financial management are a part.

An integrated approach to decision-making and operations will create an effective, lean and well managed operation, thereby increasing profits for the organisation as whole.

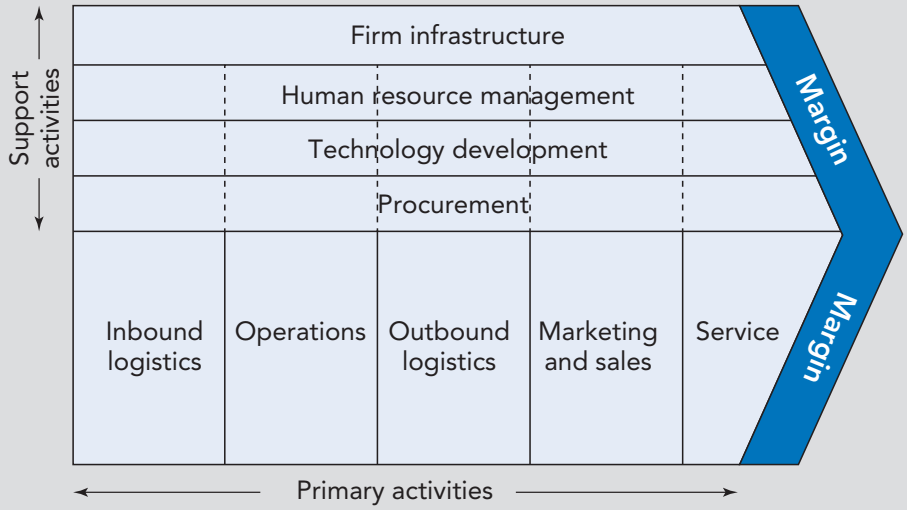


Figure 3: Porter's Value Chain (1985)

The value chain is a working model from which decisions made at "primary level" are translated into holistic practice for all the functional parts of the organisation.

OVER TO YOU

Activity 4: The Value Chain

Scenario

Ohsin Engineering manufactures components for vehicle engines. An ambitious plan has been approved by the directors to increase capacity by 100%, which will necessitate procurement of a new production line.

Tasks

1 Suggest what contributions the various primary and support functions of the organisation will make to increase its capacity.

2 Because of the increase in capacity, Ohsin's marketing and sales department has been sent high targets to generate growth. What activities would you suggest they undertake to meet these targets? What support should they receive from the other primary and support functions in the company's value chain?

Problem solving

Whilst functional areas have a contribution to make to strategic development, the scope of every day decision-making within these functional areas will fall into managerial and operational (day-to-day) activities, generally derived from decision-making necessitated by a requirement to "problem solve".

The *Business Dictionary* defines problem solving as: "The process of working through details of a problem (or issue) to reach a solution. In a managerial context, decision-making has to be structured and planned. Usually processes will be articulated in stages."

Isaksen and Treffinger (1985) perceive problem solving to be a structured but creative process, the outcomes of which provide the solutions to often poorly defined or ambiguous situations (a mess) in which the actual problem can only be defined as a result of initial research and investigation of facts, and will only end once the **principal/client** accepts the solution.

A better known and well established process is that articulated by Peter Drucker in his book *The Practice of Management* (1955). Drucker was a great exponent of the scientific approach to management.

He presents a six-stage decision-making process:

1 Identifying the problem

2 Analysing the problem

3 Developing alternative solutions

4 Selecting the best solution

5 Converting the decision into action

6 Follow up of action taken.

Problem-solving **prioritisation** will be determined by:

- **Level of impact on the business** – strategic, managerial or operational.
- **Level of urgency** – critical, important or routine.
- **Timeframe** – long-term, medium term, short term.

In response to a series of simple questions related to impact and urgency in particular, a hierarchy of priorities can be determined by using a basic multiplier. For example, if an issue is graded as being of low impact (value = 1), but high urgency (value = 5), the multiplier becomes 5; whereas on the same scale, high impact and high urgency will be 25. The table below illustrates prioritisation levels based on the effect on the company as a whole as opposed to individual teams or units.

Impact/Urgency	Critical The entire business is at jeopardy	High A significant aspect of the business operations is impacted severely	Medium An aspect has had moderate impact on functionality	Low There is a limit on functionality but alternative actions are available
1 Extensive Entire operation or critical service is impacted	**PRIORITY 1**	**PRIORITY 2**	**PRIORITY 2**	**PRIORITY 3**
2 Significant A particular unit or a non-critical operation is affected	**PRIORITY 2**	**PRIORITY 2**	**PRIORITY 3**	**PRIORITY 4**
3 Moderate Multiple units or teams are impacted to an extent	**PRIORITY 2**	**PRIORITY 3**	**PRIORITY 4**	**PRIORITY 4**
4 Minor Has limited impact on one or two units or teams	**PRIORITY 3**	**PRIORITY 4**	**PRIORITY 4**	**PRIORITY 4**

Table 4: Prioritisation – Impact/Urgency

OVER TO YOU

Activity 5: Decision-making processes

Using an organisation with which you are familiar, research the decision-making process or processes used. You should scope this research by functional activities (minimum – finance, human resources, operations and marketing).

Within these functional contexts, identify at least three different examples of decisions made (strategic, managerial, operations) and the nature of the problem, based on prioritisation.

Use Drucker's six-stage decision-making process to plot the processes undertaken to reach the outcome and identify the personnel involved at each stage.

Make notes of the outcomes.

Hint: You may need to interview relevant personnel informally.

1.3 The role of business analytics to support business decision-making

Oxford Dictionaries define analytics as "the systematic computational analysis of data or statistics" and "information resulting from the systematic analysis of data or statistics".

There is a wide range of options to consider when the business analyst is faced with researching, sourcing, collating and analysing data to support business decision-making. Broadly, these fall into three categories:

1 descriptive

2 predictive

3 prescriptive.

Descriptive analytics uses data aggregation and **data mining** to provide insight into the past to answer "what has happened?" The source is derived from historical data, which when collated in sufficient volume over time, and from accurate and varied sources and forms, provide the basis from which business analysis can be undertaken with an expectation of accuracy.

Statistics generated from the past are the most common and most useful of all organisational **data sets**, because they can be analysed to learn from past behaviours and determine how these can be used to influence future actions. They also provide a simple operational method to measure performance against specified goals and targets.

Feedback control process

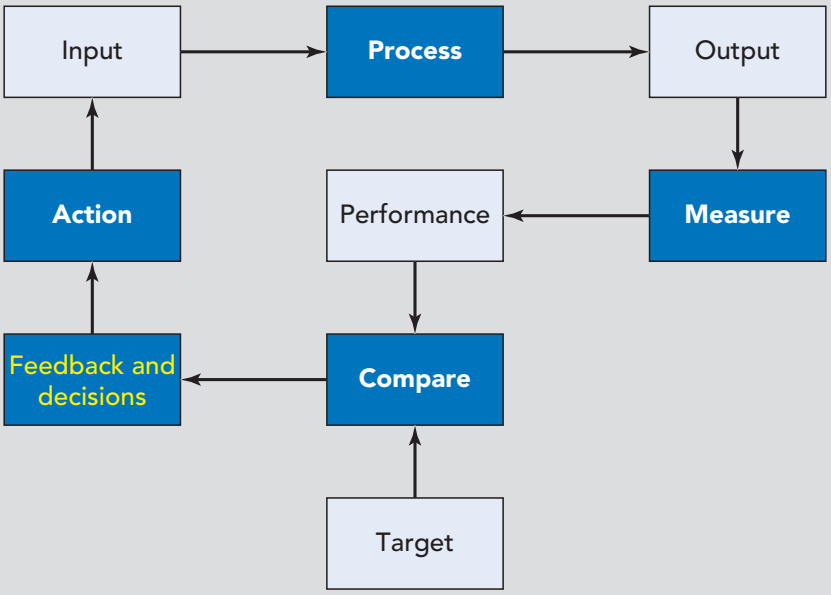


Figure 4: Feedback control process

Sources of historical data are evident in every functional area of the organisation, including financial data, sales and marketing statistics, personnel and staffing records, production and operational activities.

Predictive analytics use historical data (descriptive) to provide a rationalised insight or forecast the future; it cannot be 100% accurate as it is based on probabilities. Mathematical modelling, often with significant variables, is used to identify patterns in data and to capture relationships between data sets. Examples of predictive analysis would be forecasting sales and trends in consumer behaviour as well as stock or inventory management for economic re-order quantities (ERQ).

Prescriptive analytics provides the next stage in attempting to forecast the effect of future decisions in order to provide advice on possible outcomes. Many different data sets sourced from a variety of historical and transactional data are used. When combined with analytical techniques and tools, including business and computational modelling, this can provide the analyst with the foundation to interpret, recommend and assess a number of possible outcomes, influencing one or more courses of action. As indicated, this is a relatively complex activity and not one used for daily operations. Successful examples of these techniques in large companies are through the **optimisation** of supply chains and inventory.

Analytics in business has an increasing role to play because of the emergence of specialist software applications designed to analyse and interpret complex data sets. In the final part of this chapter, we shall examine the role of technology to facilitate and support the work of the business analyst.

Scope of business analysis to support decision-making

The potential range of business analysis includes:

- **Strategic analysis and definition** – typically the work of senior management.
- **Business analysis** – which may include resolution of a localised business issue. A key activity is the analysis, interpretation of internal business statistics and routine reporting of performance across all the activities of the business; for example: marketing performance measurement resulting from a specific campaign, production and quality targets based on output and defects, and staff turnover and productivity.
- **IT systems analysis** – information systems and **knowledge management** are considered a core infrastructure requisite for effective business decision-making within the contemporary global business environment.

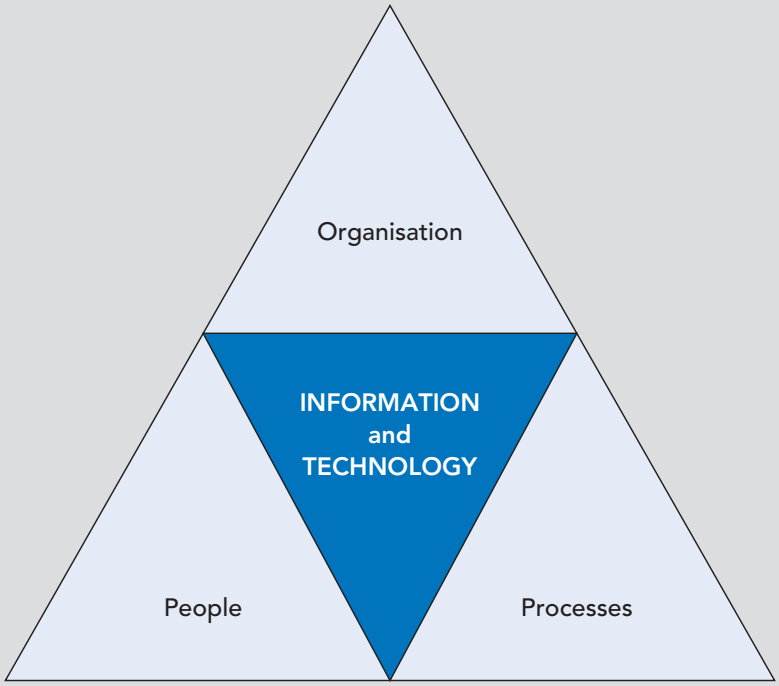


Figure 5: the POPIT model of a business system

The **POPIT** model for analysis of a business system is based on review of current systems and processes in order to analyse, interpret and influence future decision-making. Coverage of these activities includes:

- **People** – roles, job description, skills, competence, management activities, culture and communication.
- **Organisation** – business model, external environment, capabilities and business memory.
- **Processes** – value proposition, value chain and core business processes.
- **Information** – information requirements and standards.
- **Technology** – technical and application architecture.

Role and responsibilities of the business analyst

Debra Paul (2014) describes the role of the business analyst as

> *An advisory role which has the responsibility for investigating and analysing business situations, identifying and evaluating options for improving business systems, elaborating and defining requirements and ensure the effective implementation and use of information systems in line with the needs of the business.*

Whilst she goes on to say that some analysts get extended or specialist roles that include strategy implementation, business case production, benefits realisation and specification of IT requirements, the rationale for business analysis itself is to:

- root out causes, not symptoms;
- facilitate business improvement not IT change for its own sake;
- identify and evaluate options not provide solutions;
- recognise what is feasible, but not accede to all requests;
- support the entire business change cycle;
- recognise stakeholder views and negotiate any conflicts.

Project management – a role in decision-making

> *A project is a unique, transient endeavour, undertaken to achieve planned objectives, which could be defined in terms of outputs, outcomes or benefits.*

Non-routine decision-making may be the result of a specific investigation into a possible course or change of direction requested by stakeholders in the organisation. As a potentially major undertaking, a logical way forward would be through project management techniques used to develop a response to a request or brief by an initiator.

OVER TO YOU

Activity 6: Analytics roles in practice

Research and, if possible, informally interview business analysts or recruitment specialists to understand the broad spread of roles and responsibilities of business analysts in a variety of sectors.

What key attributes, skills and experience are needed to become an effective analyst?

Hint: There are many global recruitment opportunities for business analysts that specify qualifications and skills required for this role. The British Computer Society (BCS) also offers advice in this area.

1.4 Contemporary and emerging themes in a dynamic business environment

> *Saving our planet, lifting people out of poverty, advancing economic growth... these are one and the same fight. We must connect the dots between climate change, water scarcity, energy shortages, global health, food security and women's empowerment. Solutions to one problem must be solutions for all.*

Ban Ki-moon (2011)

Although Ban Ki-moon made this statement in respect of his role as Secretary General of the United Nations (2007–2016), corporate business is not immune to the changing dynamics of the global business environment. Whilst the impact of factors and trends from the external environment on organisations will be considered in greater detail in later chapters, this section provides a snapshot of some of the key themes that are impacting on business decision-making in a period of unprecedented global economic change.

Globalisation

> *Key drivers of change are forces likely to affect the structure of an industry, sector or market.*

Johnson and Scholes (2008)

Since the 1960s, with the rise in mass communications, international travel and technology, there has been a drive for business organisations to adopt **globalisation** as a key strategy. As can be seen from Yip's (1995) diagram, the pressures from political policies promoting free trade, market convergence, **cultural homogeneity**, global competition, cost advantages of standardisation and scale as well access to global markets and **trading blocs**, such as the **EU** and **ASEAN**, have provided a rationale for these strategies.

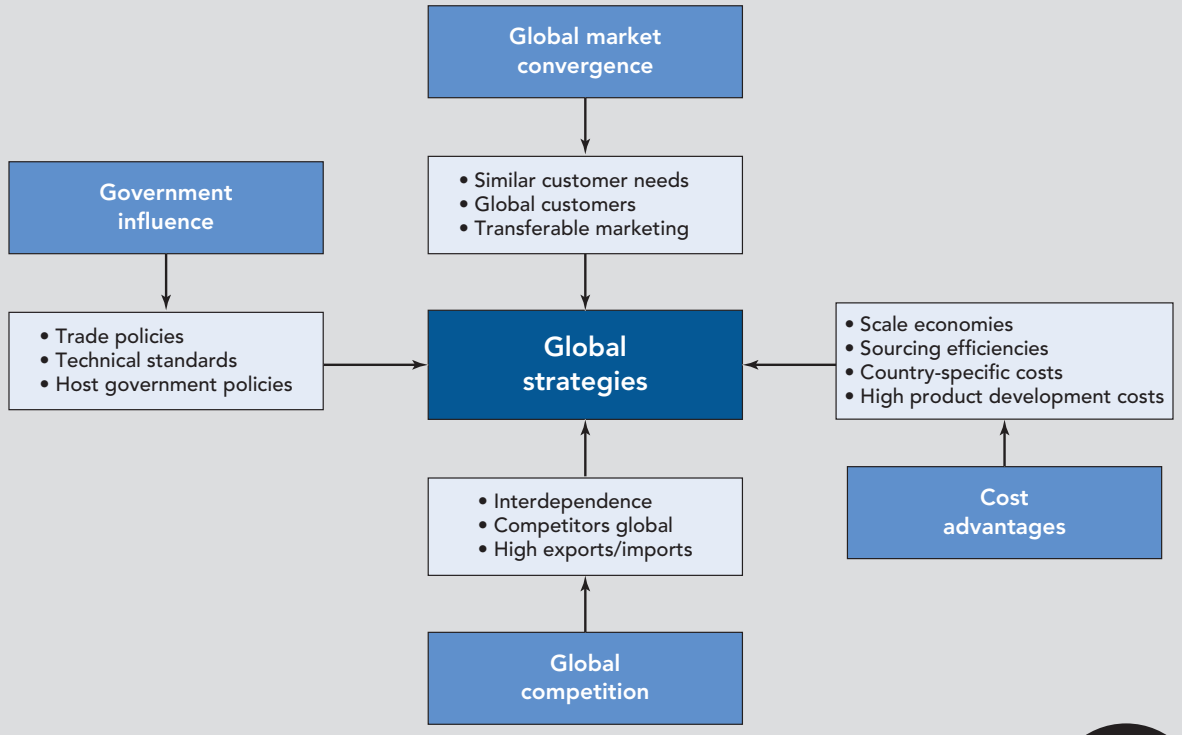


Figure 6: Drivers of global strategy (Yip, 1995)

In recent years, with a rise in educated "middle" income groups, equality and diversity, nationalism and regionalism, including political pressures caused by refugee and economic migrancy, recent referenda (including "**Brexit**") and national elections (including presidential elections in the USA), the trend towards globalisation has weakened. Many global organisations have accepted that structures and strategies supporting localisation (i.e. developed to take into account the nature of local markets and constructed to suit preferences and structures) may be the way forward by using it as a source of competitive advantage. This combination of forces (globalisation + localisation) is sometimes known as "**glocalisation**".

Corporate strategy trend

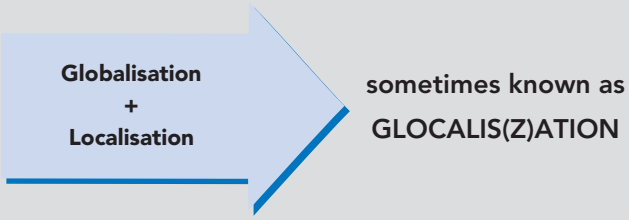


Figure 7: Glocalisation

Corporate Governance

The *Business Dictionary* describes **corporate governance** as: "The framework of rules and practices by which a board of directors ensures accountability, fairness and transparency in a company's relationship with its all stakeholders".

This theme has been driven by both international political and wider business communities to provide protection from illegal and/or unethical decisions and practices by the senior management, which have been particularly widespread in the financial sector, but also in other areas. Corporate scandals have involved Bernard Madoff's Ponzi scheme and the collapse of Lehman Brothers – price fixing and tax evasion may have influenced **codes of practice**, as corporations are expected to consider the wishes of the wider stakeholder community and can be held accountable if they fail to comply.

This has created tensions between drive for profit (shareholder expectation) and a greater stakeholder influence, which may consider the long-term purpose of the organisation to be creating stakeholder satisfaction, thereby encouraging corporate sustainability.

A **stakeholder** is a person, group or organisation that has direct or indirect stake in an organisation because it can affect or be affected by the organisation's actions, objectives and policies.

The Shareholder vs Stakeholder model of Governance from Johnson, Scholes and Whittington (2008) presents the following benefits and disadvantages to the two models respectively:

Shareholder model

Benefits

- For investors: higher rate of return and reduced risk
- For the economy: encourages entrepreneurship and inward investment
- For management: independence.

Disadvantages

- For investors: difficult to monitor management
- For the economy: the risk of short-termism and management greed.

Stakeholder model

Benefits

- For investors: closer monitoring of management and longer-term decision horizons
- For stakeholders: deterrent to high-risk decisions.

Disadvantages

- For management: potential interference, slower decision making and reduced independence
- For the economy: reduced financing opportunities for growth.

Figure 8 shows the stakeholder groups of a firm (adapted from Stakeholders – from Johnson, Scholes and Whittington (2008)):

The firm's stakeholders

Figure 8: Stakeholders, adapted from Johnson, Scholes and Whittington (2008)

The **OECD** *Corporate Governance Factbook* (2014) was published to provide guidance for organisations to develop appropriate, transparent frameworks that were compliant with the principles of codes of practice. This included the composition of the boards of directors, remuneration and pay awards of senior and other management, fair and equitable treatment of shareholders and the wider stakeholder community.

Although financial institutions are required to provide clear information and report on corporate governance annually with their financial reports, many other companies (particularly those that have been hit by some form of corporate scandal) will also publish this information on their website.

Therefore, the key issues for corporate governance are:

- it is driven by a need for transparency and accountability;
- there is a need to restore investor confidence after financial scandals and corporate collapse;
- investors and governments are proactively seeking reforms;
- corporate boards are more accountable;
- there are qualified independent non-executive directors;
- audit committees are independent;
- external audits are able to perform appropriately;
- the rights of shareholders are protected.

Ethics

Closely linked to corporate governance as an emerging theme is the role of ethics: "The application of a moral code of conduct to the strategic and operational management of a business" (Applied Corporate Governance) and the formalisation of a policy of corporate and social responsibility (CSR).

Business ethics are defined as the "moral principles that guide the way a business behaves. The same principles that determine an individual's actions also apply to business" (Business Case Studies). Business ethics concern:

- behaviour towards customers, suppliers, distributors and competitors;
- treatment of employees – equality and diversity;

- treatment of stakeholder groups;
- the effect on the natural environment;
- conduct in international operations.

Many governments, trade blocs and organisations have an expectation – in some cases mandatory – that corporate businesses will proactively develop approaches and initiatives embracing ethical principles. These are articulated in policies covering:

1 corporate and social responsibility
2 **environmentalism**.

Corporate and social responsibility (CSR)

> *"Corporate responsibility is concerned with the sustainability of an organisation's ethics over the long-term. At its core, corporate responsibility seeks to add value to an organisation's activities by ensuring they have a positive impact on society, the environment and the economy."*
>
> *Chartered Institute of Personnel and Development*

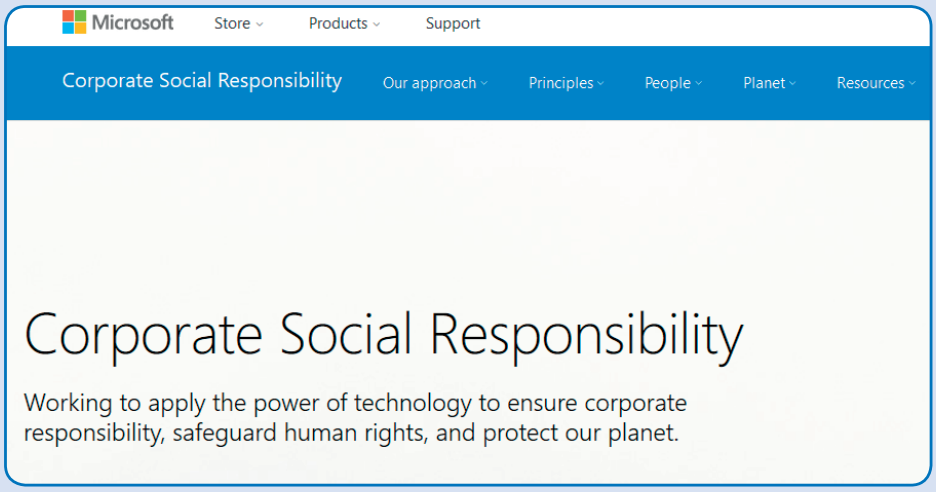
The **CIPD** describes corporate responsibility as including financial, social and environmental responsibility. These are often described as having a long-term impact on the "**triple bottom line**" of people, power and planet.

Carroll (2001) identified that the stance taken by an organisation depended on their stage in terms of a pyramid of social responsibility. In other words, the organisation had to work through each level before being able to take the next step in CSR development.

Figure 9: Pyramid of social responsibility (adapted from Carroll, 2001)

CASE STUDY

CSR in Microsoft



Microsoft has embedded CSR and philanthropies within its corporate website. Take a look at some of the policies it has adopted and activities in which it is involved.

https://www.microsoft.com/en-us/about/corporate-responsibility

Environmentalism

Linked to ethics and CSR are demands for organisations to adopt environmentalist policies – i.e. concern for the "natural" environment. The global community has conducted several high profile conferences focusing on concerns for the natural environment and the need to deal with climate change, global warming, waste management and CS gases. These are supported with initiatives such as carbon trading and imposition of low emission zones in city areas. Agreements from Kyoto (1997) through to Paris (2015) have set targets for transition to low carbon economies, requiring "climate finance" and increased spending on low-carbon technologies by at least five times in 20 years in order to limit global average temperatures below the 2°C increase from pre-industrial levels.

Many organisations, particularly those operating in the energy sector, publish policies and initiatives which espouse the agreements. Internally, even small organisations are expected to comply with appropriate waste management policies and are expected to report their outcomes.

OVER TO YOU

Activity 7: Environmentalism – BP Global

BP, the global energy business recognises the importance of managing local environmental impacts. Go to the sustainability section of its website (http://www.bp.com/en/global/corporate/sustainability/environmental-impacts.html) and take a look at some of its initiatives and case studies on this subject. Make your notes below.

OVER TO YOU

Activity 8: Contemporary and emerging themes for business analytics 1

Investigate the website of another global corporate business with which you are familiar. Make notes on the published policies, practices and activities undertaken under the headings of:

1 Corporate governance

2 Ethics and corporate and social responsibility

3 Environmentalism

Based on your knowledge of the company and Carroll's pyramid of social responsibility, which level do you consider your chosen organisation is at? Suggest actions which would help move the company up to the next level.

Technological developments and work practices

Technology and its development continue to be at the heart of many major external factors driving change and impacting on business activity and work practices.

Many facets of globalisation, including marketing, would not have been possible were it not for the development of mass electronic communication. The development of the World Wide Web (WWW) by Sir Tim Berners-Lee in 1989 has revolutionised business operations and stakeholder awareness. Global sales of smart phones to end users were close to 1.5 billion in 2015.

For the organisation, technological developments are likely to be an integral part of every single activity in which it is involved (see "Technology" in Porter's Value Chain, 1985). Ever since the development of computers in the 20th century, there has been an inexorable rise in the use of technology to drive organisational change and operations. Essentially, technology in business falls into a number of categories:

Technology as a business

- **Business-to-Business (B2B)** – development of specialist hardware, software and management of IT supports business activity.
- **Business-to-Consumer (B2C)** – technology products, hardware (the vehicle) and software (the application) are sold directly to consumers. Examples are personal computers, media, mobile phones and games software.

Technology in marketing

- **Communications, information and promotion** – through web pages, social and viral media, webinars.
- **Distribution** – supply or streaming of paid-for-information, e.g. online books, television and films.

Technology in business operations

- automation and robotics
- quality management
- supply chain – procurement, supplier and distributor management
- inventory management
- management, administrative and reporting systems, (MIS)
- financial reporting
- communications and virtual collaboration.

Technology in business analytics

The greatest developments in technology relate to:

- Advanced software management applications and programmes to support descriptive, predictive and prescriptive analytics.
- Access to analysis and interpretation of vast amounts of data obtainable through internal and external resources, resulting from computerised data management (Business Analysis).
- A rise in **business intelligence**, often provided by third party analytics consultancies with sector specialisms. These consultancies use applications to support the needs of clients by supplying rapid and informed data collection and interpretation.

Issues and risks for decision-makers in a dynamic business environment

The measure of effective decision-making is outcome performance. Where analytical decision-making techniques are used, these are based on actions determined by analysis and interpretation of (historic) data, modelled to predict likely outcomes on which to base decisions created in pursuit of a set of quantified goals, objectives and targets.

Contemporary and emerging themes in the business environment will make decision-making difficult for senior executives and managers because of the nature of an unpredictable global economy. Issues for consideration are:

- lack of (reliable) quantifiable, historical and trend data on which to base analysis, interpretation and judgement;
- lack of accurate and proven data – despite the vast amount of data sourced through the internet, this media can be subject to inaccurate reporting and interpretation as well malicious misinformation (note, the recent development of phrases such as “false news”, or “post-truth” – where information is “cherry-picked” to match a chosen viewpoint);
- unknown experience and impacts of decision-making creates uncertainty;
- difficulties in using quantitative data and qualitative decisions to forecast/predict future outcomes;
- the need for transparency, focus on business ethics, corporate governance, and social responsibility and the presence of increased regulatory enforcers limits the decision-makers attitude leading to risk aversion and greater focus on compliance rather than entrepreneurism.

The difficulty for decision-makers in a fast-moving and dynamic business arena, in which external factors including technologies are driving and enabling rapid change, is that the factors contributing to predicted analytical outcomes are subject to almost instant alteration, thus creating uncertain futures. As far back as 1954, Drucker argued that “some management teams were simply more foresightful than others,” which might lead a decision-maker to conclude that a “gut feeling” for entrepreneurial decisions is probably just as good as one justified by analysis.

CASE STUDY: TARGIT'S BUSINESS INTELLIGENCE (BI) TRENDS 2017

Predictions for the emerging and strengthening BI and analytics technology market trends for the coming year

1 **The rise of leadership via data** – self-service BI, better and more meaningful data visualisations and expanded user adoption foster a nimble BI and analytics environment that will define the data-driven leadership leading from data reporting to interpretive "story-telling".

2 **The time-insight window is collapsing** – increase in technology such as in-memory and processes connecting directly to data sources, 2017 platforms can process millions of rows of data instantly.

3 **Increasing value of predictive analytics projects** – 2017 will see a rise in sensors, algorithms and technologies to help predict upcoming events.

4 **The stronger need for more powerful data governance** – self-service BI is important but so too is the assurance that your data is always correct.

5 **Increasing reliance on the cloud** – more harnessing of cloud-based data sources will lead to an increasing number of BI users being able to connect easily to, integrate, mashup and analyse data from sources outside the existing data warehouse.

Case study: https://www.targit.com/en/offers/ebooks/ebook-trends2017/

OVER TO YOU

Activity 9: Technology – BI trends

Basing your answer on a company with which you are familiar:

1 Assess your company's attitude to decision-making. Is it based on analytics or instinct? Are they risk averse?

Using the technological developments outlined above (starting on page 27) and trends suggested by Targit in the case study:

2 Identify with specific examples how your selected organisation has responded to these developments.

3 How could these trends help your selected organisation develop its decision-making practices in the future?

READING LIST

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RESOURCES

References

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www.targit.com

Summary

In this chapter, we have discussed the concepts related to strategic, managerial and operational decision-making in businesses operating in the global environment. We have considered:

- nature and types of decision-making;
- decision-making in the context of external and internal contexts, including organisational culture;
- decision-making processes and models;
- problem solving;
- the role of business analytics and the business analyst;
- contemporary and emerging themes, including globalisation and ethics;
- technological developments and work practices;
- issues for decision-makers in a dynamic business environment.

Although the focus for this chapter concerns multi-national and global organisations, small business enterprises, often based on technology, are an important and growing part of the global **infrastructure**, often driving the focus of business operations to regional and local strategies. The rise of technology as a sector in its own right encompasses many global enterprise successes.

Chapter 2

Business Information Management

Introduction

> *Organisational knowledge is the collective experience accumulated through systems, routines and activities of sharing across the organisation.*

Johnson, Scholes and Whittington (2008)

David Teece (1997) suggests that in a rapidly changing business environment, organisations need dynamic capabilities in order to achieve competitive advantage. In other words, "the organisation's ability to renew and recreate its capabilities to meet the changing needs of the environment." It is acknowledged that a main contributor to the dynamic environment referred to by Teece has been increasingly sophisticated communication and information systems with rapid access to vast amounts of data.

Spender (1996) talks of the differences between explicit and implicit (tacit) knowledge. Whilst the latter is achieved through the learning and practical experiences of groups or individuals within the organisation, explicit knowledge is "codified" into formal systems – a management information system – which is then shared between groups, often using computer-based systems as a framework. Effective links between knowledge, experience and the social (and cultural) interaction of the participants may facilitate a culture of the **learning organisation** – one of the key attributes of competitive advantage.

In this chapter, we will be examining the types of business information and information systems available for core functional areas of a business organisation, the source and use of the data, systems and technologies for relevant decision-making.

Learning outcome

On completing this chapter, you will be able to:

2 Assess business information management data and systems appropriate for analytical decision-making in a variety of contexts.

Assessment criteria

2 Assess business information management data and systems appropriate for analytical decision-making in a variety of contexts.

2.1 Evaluate data retrieval, analytics and information management systems and methodologies.

2.2 Assess how data sources and use of technology can benefit analytical decision-making in varied contexts.

2.3 Examine a range of varied data sources and sets for a specific purpose in a range of organisational, functional and complex contexts.

2.4 Evaluate the validity of data sources in contemporary contexts.

2.1 Data retrieval, analytics and information management systems and methodologies

Role of management information

Information and technology are two of the four resources which can be assessed to determine organisational capability. The purpose of management information is to enable organisations to analyse data to facilitate appropriate decision-making at all levels of the business: strategic, management and operational.

Understanding end user profiles and end user uses are fundamental to the effectiveness of the system. The MIS is not an end in itself, but rather a tool to be designed for the benefits of the organisation and to improve the decision-making and work of staff. The table below suggests that MIS should be designed to provide:

- management support (reports and decision-making modelling/support)
- knowledge and network management
- operational support (functional aspects of the business).

Figure 1: Role of management information, adapted from Encyclopaedia Britannica Inc. (2012)

Management information systems (MIS)

According to the *Business Dictionary*, management information system (MIS) is "an organised approach to the study of the information needs, and computerised systems continuously gather relevant data from both inside and outside the organisation."

This information, held in a database or series of databases (data warehouse), is processed to provide accurate and timely reports in a format appropriate for practical use by staff within the organisation. Retrieval of this information (which may be sensitive or confidential) is usually controlled by access rights based on a staff member's role or position in the organisation.

Figure 2 illustrates an example of an MIS based on an organisation's operational data management system. The focus for the MIS is data from the organisation's daily business transaction, e.g. sales, production rates, income/expenditure, sourced from the company's intranet and extranet. Once input into the system, this information is then held in relevant databases for extraction by the various functional areas of the business in the form of reports – some routine, others to highlight specific aspects of business performance in order to inform decision-making throughout and at every level of the business.

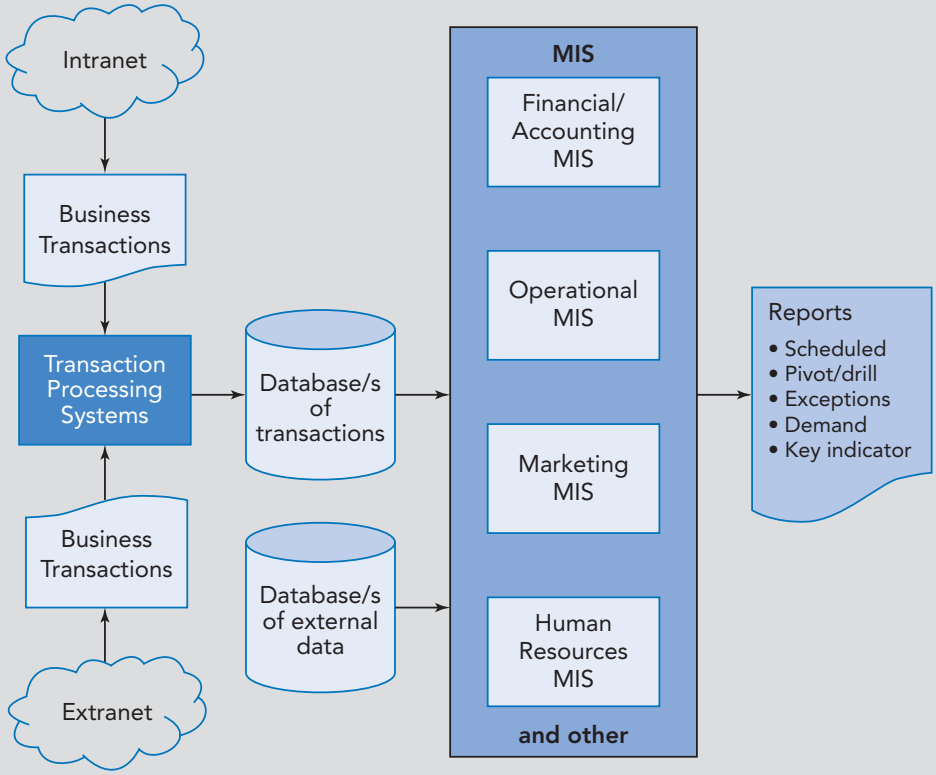


Figure 2: Management information system structure, adapted from book.transtutors.com.

Intranet and extranet

Intranet: a local or restricted communications network, especially a private network created using World Wide Web software.

Extranet: an intranet that can be partially accessed by authorised outside users, enabling businesses to exchange information over the internet in a secure way.

The data obtained from the intra- or extranets tends to be explicit, objective and quantifiably recorded. Even qualitative data, such as customer survey responses, are analysed using quantitative mathematical techniques. Analysis from such data tends to be accurate and informed.

However, data can also be retrieved from external sources pertinent to the business and its business environment, including the World Wide Web. Unlike information obtained from business transactions, inputs may not be regular or continuous, but intrinsic or tacit as a result of knowledge and/or experience, perhaps in response to a specific event or as part of the planning process. In this case, some form of research will have been undertaken to meet the requirements of a brief or project. The structure of that research, source and data periods may be inconsistent, or in some cases may not be quantitatively objective, but rather data gleaned informally through "hearsay" and discussion by managers, often through networking. In any event, such form of intelligence will prove to be a useful source of information for organisational development and growth. In a later section, we will be looking at the veracity of data in more detail.

Data retrieval and analytics

Data retrieval is a process which assumes information (often raw) has been input into a database that can then be interrogated to be extracted for use elsewhere, such as measurement, control, analysis, interpretation and reporting, in order to facilitate the decision-making process. Data retrieval should not be a process of data finding (i.e. a more complex search for information).

With technology widely available, almost as a third arm, data retrieval is a routine activity in which almost all individuals engage on a daily basis. In organisations, this is no longer a specialist activity but dispersed throughout departments as needs demand. When regular reports are required or managerial decisions need to be made, data retrieval to support the decision-making process is often delegated to more junior staff, who are given the specific remit of accessing, filtering and disseminating the relevant information.

Whilst the manager's responsibility may be to interpret the data sourced and then make decisions based on the facts given, the actual retrieval process is not considered to be a difficult or complex activity. However, this has quite significant potential for problems. Importantly, data retrieval assumes some core principles – that the data accessed is robust, i.e. **VACS** (valid, accurate, current and sufficient), even complete. Lack of knowledge, poor data retrieval design and techniques, input errors, paucity of relevant data can all lead to inadequate analysis and poorly thought-through assumptions – a likely basis for defective decision-making. In this respect, therefore, the skill of the IT specialist lies in understanding the needs/requirements of the internal client (business function) and then building a data retrieval system that is easily accessible to the non-specialist. This can then be filtered to provide sufficient information in a form readily understood by those needing to analyse and interpret it, with a recognition of the limitations that may hinder data collection. In other words, those depending on authentic and reliable data must have confidence that that what they see is credible and fit-for-purpose.

This is also true for a business analyst who may have an advisory role, and is charged with analysis and interpretation of a business sector or function with an assumed depth of knowledge and understanding of the market, its various components, operations and functions, sufficient on which to base cogent recommendations. The client (internal or external) has an expectation that the analyst will be a credible source able to support interpretation and bring a knowledgeable

and justifiable objective perspective to his/her advice. More likely there will be an expectation that the business analyst will provide answers to dilemmas, such as problem solving and solution recommendations, on the basis of accurate data retrieval and management to facilitate business and functional decision-making.

2.2 Data sources and the use of technology

Types of data extracted for business use come from a variety of sources. Similar to the structure of the business environment, these can be categorised into three broad categories.

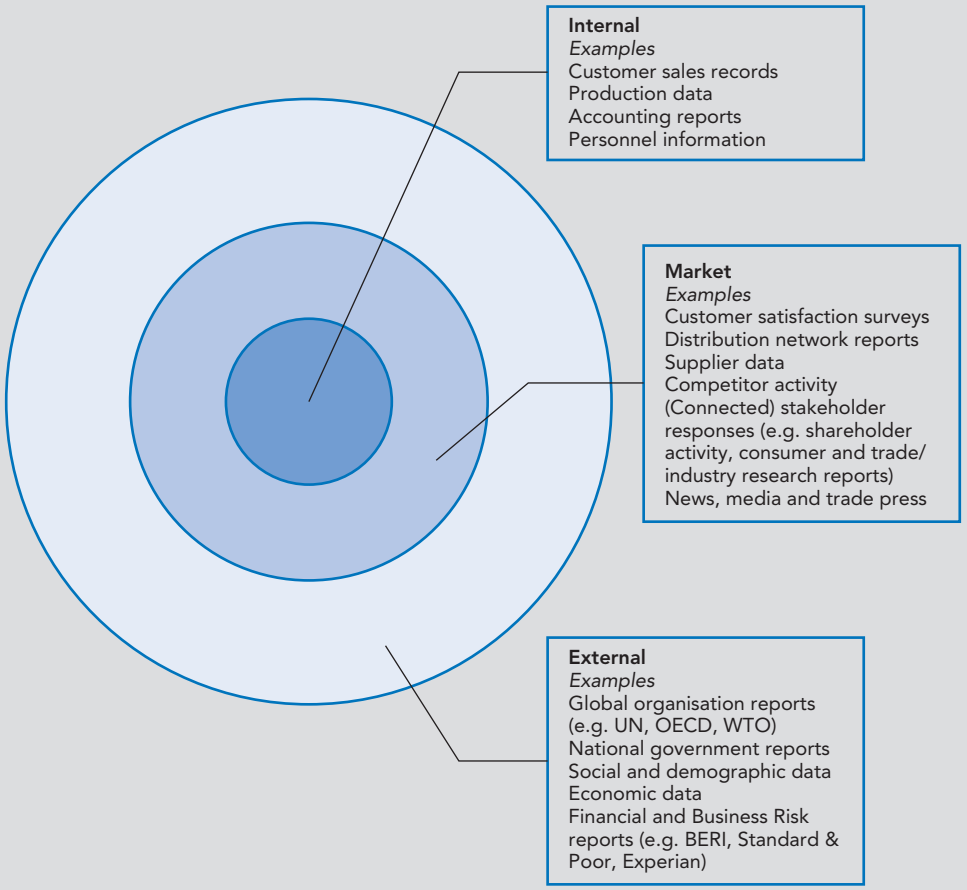
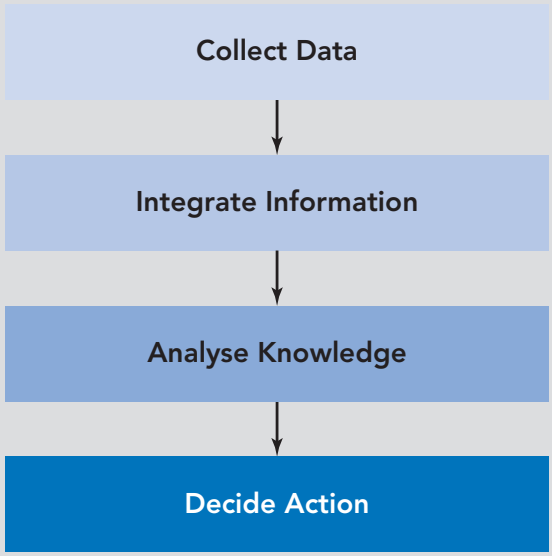


Figure 3: Data sources

If data retrieval is concerned with extracting data, often from internal business transactions that enable management and operational decisions, strategic decisions are based on a combination of analysis developed from both internal data sources and structured research using a much broader set of qualitative and quantitative sources. Much of the data is collected on a routine or continuous basis and is used for regular reporting purposes. However, when data is extracted for periodic or specific circumstances, or for the purpose of strategic planning, then the role of data is to support Business Intelligence (BI). BI also uses analysis of historic data, knowledge and experience in order to anticipate and forecast developments in the market. In many instances, technology has developed modelling techniques to reduce potential inaccuracies and enhance the probability of forecasted outcomes.

Business Intelligence (BI) is the continual process in which organisations collect, integrate and analyse data in a structured way in order to apply the resulting information and knowledge to decision making processes with the intention of improving the performance of the organisation.



Business Intelligence: a definition

Figure 4: Business Intelligence (BI)

Technology and the knowledge economy

> *"Knowledge is now recognised as the driver of productivity and economic growth, leading a new focus on the role of information, technology and learning in economic performance."*
>
> *OECD (2014)*

This combination of information sources coupled with knowledge, experience and organisational learning provides a basis for what is now known as the knowledge economy – "characterized by the recognition of knowledge as a source of competitiveness; the increasing importance of science, research, technology, and innovation in knowledge creation; and the use of computers and the Internet to generate, share, and apply knowledge," *Encyclopaedia of Science and Information Technology* (2009). These developments have spawned a wealth of methodologies as well as standard and specialist software systems designed to aid information sourcing, analysis and management for forecasting (predictive).

Database management systems

A **database management system** (DBMS) is a software package or collection of packages with interfaces, designed to define, manipulate, retrieve and manage data in a database. A DBMS generally manipulates the data, the data format, field names, and record and file structure. It can also be programmed or adapted so that users can interrogate it to access relevant information, including forecasts for a specified purpose.

The manipulation of data using these often sophisticated software packages has inspired a whole new language of methodologies. Examples of the current, more frequently used methodologies are:

Data mining – the technique of identifying patterns and relationships through the use of advanced statistical methods, from large amounts of information gathered from pre-existing data stored in a database or data warehouse. Example: the information held by a supermarket through customers' use of the store loyalty card, or charge card.

Machine learning – a type of artificial intelligence that provides computers with the ability to learn without being explicitly programmed. Machine learning focuses on computer programs that can change when exposed to new data. Machine learning uses that data to detect patterns in data and adjust program actions accordingly (Techtarget.com). Machine learning falls into two types: "supervised", where the computer is given patterns of data with outcomes to use to develop predictions based on similar data formats, and "unsupervised", where datasets are random. Examples include optical character reading (OCR), face detection, topic spotting and customer segmentation.

Data mashup – a process bringing together a variety of data from multiple sources and combining them in a way that clarifies or enhances analytics and BI. In business, they usually combine internal data with that retrieved from one or more outside sources.

Data visualisation – the presentation of data in a pictorial or graphical format. It enables decision-makers to see analytics presented visually, so they can grasp difficult concepts or identify new patterns.

Many of these systems have been developed by well-known industry or branded software specialists, catering for all sizes and types of businesses. Operating under the heading of BI, these companies promote their systems actively across the World Wide Web, recognising that BI, part of the knowledge-based economy, has one of the largest growth rates in business activities. In a study commissioned by The Forrester wave™: Enterprise Business Intelligence Platforms, Q1 2015, mainstream companies such as Microsoft, Oracle, IBM and SAP dominated the market.

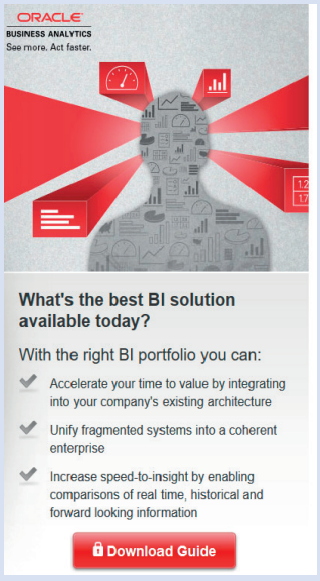
CASE STUDY

BI – Technology in action

Microsoft Power BI

https://powerbi.microsoft.com/en-us/what-is-power-bi/

Oracle Business Analytics



https://go.oracle.com

Other links to look at:

https://www.ibm.com/business-intelligence

https://www.sap.com/uk/solution/platform-technology/analytics/business-intelligence-bi.html

http://www.qlik.com/en-gb – Qlik let you download trial software for free!

2.3 MIS in business functions

In Chapter 1, we used Porter's Value Chain to describe the benefits to profit margins of effective linkages between different parts of the organisation. Management information systems (MIS) forms part of the firm's infrastructure, which has an overarching responsibility for coordinating the firm's activities. Some would consider that the information system is actually the framework or "skeleton" of the organisation around which communications form the "muscle", enabling the various functional ''organs and ''limbs" of the business to operate.

MIS in the Value Chain

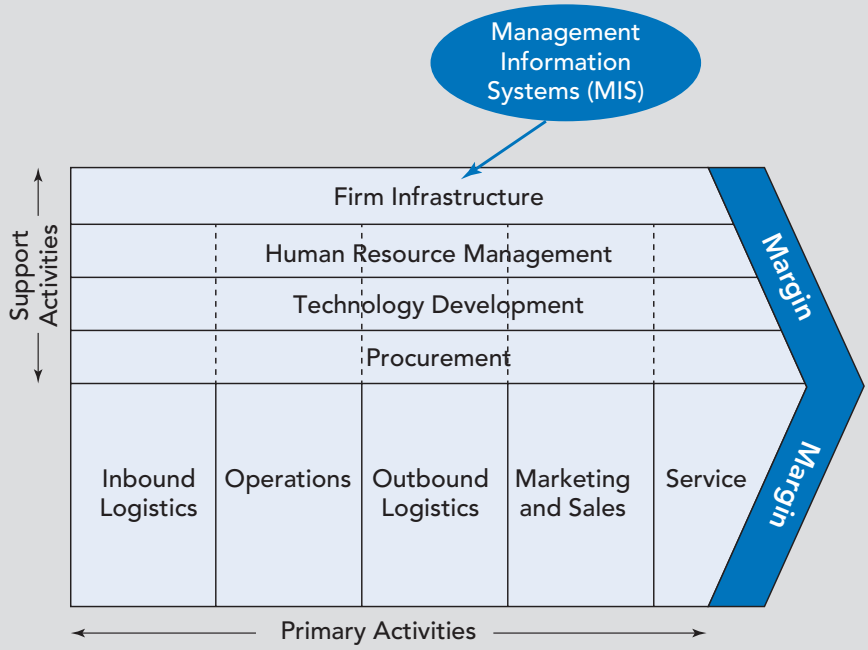


Figure 5: MIS in the Value Chain Adapted from Porter's Value Chain (1985)

You will recall that in Chapter 1, we also identified the functional areas of the business as being:

- finance and accounting
- human resource management
- operations and production
- marketing (and sales)
- procurement.

Other defined categories, dependent on the nature of the business and importance of these activities, may include:

- information systems (MIS and IT)
- research and development.

Each area requires separate information, held in databases in order to plan, execute and monitor its activities. Sometimes, these databases are developed from specialist systems and applications, designed to source and provide information for that particular functional area. These are then linked together to form an overarching MIS, accessible by other parts of the organisation.

OVER TO YOU

Activity 1: MIS in business functions

Make a table with the following headings: Functional area, Information report, Frequency and Sources.

Based on the four key functional areas above (finance, human resource management, operations/production and marketing) plus procurement, make a list of the type of information reports that would be required, how frequently the information should be reported and where and what that data source was likely to be. See the illustration below.

Function	Information report	Frequency	Sources
Finance	*Income and expenditure*	*Monthly*	*Sales invoices* *Purchase invoices*

Now, add a further column, headed Management use, and identify how this information could be used by management in the business to facilitate decision-making.

The range of reports from all parts of the organisation is significant and growing daily. There is a management expectation that effective use of information will help foster efficiency and facilitate decision-making. In this next section, we will examine examples of information databases widely used by functional areas to support operations, but which can be used by other areas of the business and indeed external trading partners, to help efficiency, development and growth.

Marketing

> *"Marketing identifies unfulfilled needs and desires. It defines, measures and quantifies the size of the identified market and the profit potential. It pinpoints which segments the company is capable of serving best and it designs and promotes the appropriate products and services."*
>
> *Kotler (2013)*

Organisations have very different approaches to the marketing function. Whilst some limit activities to the promotion of goods and services, others drive the organisation's development through marketing strategy. To achieve Kotler's vision and gain competitive advantage, marketing should include:

- intelligence and research
- marketing strategy – planning and development
- **marketing communications**
- customer relationship management (**CRM**).

Consequently, marketing probably uses the widest range of databases in any organisation for information management in order to manage both its marketing planning and communication functions, as well as the internet for promotion and distribution (e.g. web pages, social media and online purchasing). Connectivity to prospects, customers and distribution networks are invaluable.

Marketing planning

Underpinning marketing planning activity is the marketing information system (MkIS) – the "system in which marketing data is formally gathered, stored, analysed and distributed to managers in accordance with their informational needs on a regular basis" Jobber (2007).

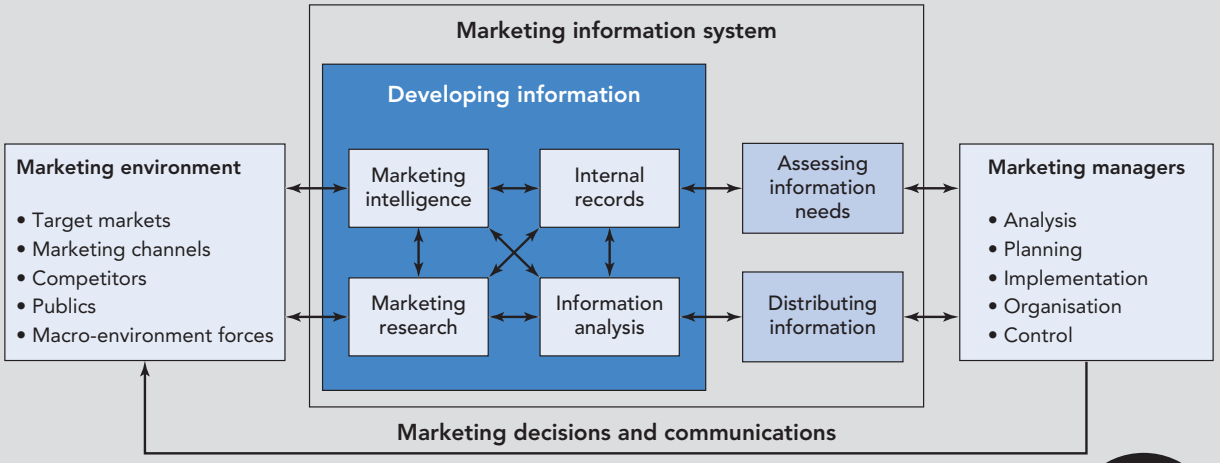


Figure 6: Marketing Information System (MkIS), from Kotler et al (2006)

In this respect, the role of the marketing analyst is to interpret data drawn from a wide range of internal and external sources in order to provide marketing (and strategic) managers with information on which to base decision-making for the future advancement of the organisation. This information makes a significant contribution to the work of strategic managers concerned with the long-term development of the business.

Sue Germanian of the DMA believed that, "Marketing should be channel agnostic (i.e. no loyalty to any particular communication or distribution channel), data driven and customer centric". The MkIS provides data on which to base (and justify) decisions. Although the MkIS draws from a wide range of sources, specific marketing-related databases include market research and customer relationship management (CRM).

Market research

The Entrepreneur defines market research as

> *"The process of gathering, analyzing and interpreting information about a market, about a product or service to be offered for sale in that market, and about the past, present and potential customers for the product or service; research into the characteristics, spending habits, location and needs of your business's target market, the industry as a whole, and the particular competitors you face."*

Whilst secondary research is extracted from external published sources, primary research is undertaken for a specific or continuous purpose of evaluating current or potential customers' perception and satisfaction in an organisation's product or service proposition. Sources of data may include response to specific surveys, but using technologies may also elicit generic information about the numbers of "hits" on a website or customer responses to marketing communication strategies.

Results of market research activity are of course subject to the same concerns of other databases (i.e. VACS). Additionally, flaws in research design can be prevalent. For example, is the research measuring what it is supposed to measure? If there are doubts, then it is possible the results should also be questioned.

A major source of information for the marketer will be through the CRM database, discussed next.

Customer relationship management (CRM)

Customer Relationship Management (CRM) is a well-known term whose focus is on the management of the customer interface to improve customer relationships through optimising sales, customer satisfaction and retention. In principle, all organisations have some form of CRM as part of the customer interface. However, current thinking indicates that a robust CRM system uses technologies (such as websites, online "shops", direct mail and social media) to interact with customers across different channels. They do this in order to compile data related to personal customer information, purchase history and buying preferences. Broadly, a CRM system covers four key areas on which a company can base short or long-term market development decisions:

- marketing
- sales
- customer service (and complaints)
- technical support.

Finance and accounting

If marketing management is about the customer interface, financial management provides the "life-blood" of the organisation – the resource through which income is derived, suppliers and staff are paid and owners receive a **return on investment (ROI)**. Without effective financial and accounting management, the organisation's survival will be in doubt. In effect, finance and accounting are "two-sides of the same coin" – the focus for the former is primarily financial management: "the planning, directing, monitoring, organising, and controlling of the monetary resources of an organisation"[1]. This may include budgeting, costing and pricing strategies of products and services, investments and capital purchases.

Whilst "management accounting is the sourcing, analysis, communication and use of decision-relevant financial and non-financial information to generate and preserve value for organisations"[2], the accounting function concentrates on the day-to-day record keeping of financial transactions and cash flow. They are also responsible for the submission of regular financial returns for tax and other authorities, as well as internally providing the management accountant with regular reports on which to base organisational performance. Both functions are vital – if daily transactions are not properly accounted for or reported, management will fail in the fundamentals of its role to enable the organisation to prosper and provide appropriate returns for the investors.

The core of financial information management lies in the recording of transactions through industry-developed software, sometimes tailored specifically for the company. Software functions include:

Core accounting	Fund accounting	Inventory (stock) management
Billing and invoicing	Budgeting and forecasting	Fixed asset accounting
Payroll management		

http://www.softwareadvice.com/uk/accounting/#buyers-guide

Table 1: Software functions in the financial and accounting sector

Financial report and accounts

Probably the most useful source of information for reviewing company and industry performance is the firm's financial accounts. Required by most national regulatory authorities, these are published; usually accessible on the firm's website in the form of annual reports and accounts. Not only is the financial information invaluable, it will also cover previous years' activities so trends in like-for-like

1 www.businessdictionary.com
2 CIMA Global

performance can be established. It will include a chief executive officer (CEO) report on the activities for the past year and an indication of plans for the future. A **caveat** of course is that although the report data must be verified, interpretations can lead to anomalies or differences in opinion. After all the published reports and accounts, along with the website are an effective and classic example of marketing communications between company and stakeholders to promote the organisation and its strategies and enhance image and brand.

CASE STUDY

HSBC Global

Take a look at the annual report and accounts for HSBC Global at the following link: http://www.hsbc.com/investor-relations/group-results-and-reporting/annual-report. Start by studying the trends information in the Highlights on page 2 of the Annual Report 2016.

Procurement and supply chain management

The Chartered Institute of Purchasing and Supply (CIPS) defines procurement as a function which "involves buying the goods and services that enable an organisation to operate ... responsible for sourcing raw materials from suppliers worldwide and bringing them into the organisation to enable the production of goods for customers".

Whereas Investopedia considers the supply chain "is a network between a company and its suppliers to produce and distribute a specific product, and the supply chain represents the steps it takes to get the product or service to the customer. Supply chain management (SCM) is a crucial process, because an optimized supply chain results in lower costs and a faster production cycle".

In both cases, operational data, sourced from financial, marketing, procurement, production, logistics and distribution activities, will test the effectiveness of supply chain management (SCM). Successful SCM often develops as a form of control of business partners by one particularly influential member of the supply chain.

Porter captured the concept of supply chain management, when developing the idea that individual firms in the supply chain are part of a series of organisational networks (value chains) forming a "value system" in which each part contributes to the profitability and success of the whole. Recognition of the "power" of the whole and the building of supplier relationship management has done much to improve supply chains' longevity and effectiveness, reducing the risk of price wars and anti-competitive behaviour. Figure 7 demonstrates that competitors are an intrinsic part of the value system because they make decisions in response to changes in the market, as do the rest of the system members. This impacts on market direction and the dynamic nature of the business environment.

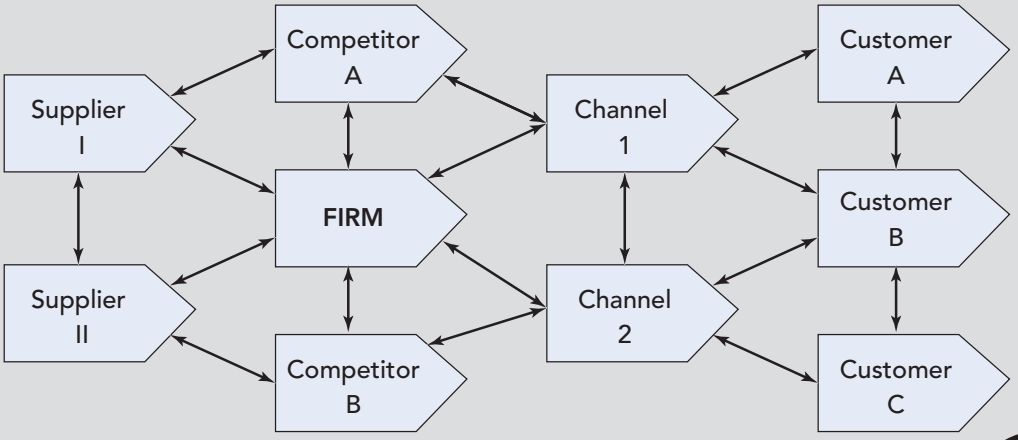


Figure 7: The Value System, adapted from Porter

As discussed earlier, each aspect of the operation relies on both the intranet (internal) and the interface between the supply chain and the company through an extranet. An example of an extranet would be the Electronic Data Interchange (**EDI**), which links the organisation with both suppliers and distributors (trading partners) to create automatic ordering, stock/inventory management, payment processing, etc.

Production and operations

Production and operations are particular to the nature of the business sector. In (automated) manufacturing, each stage of the production process will be logged with measurements taken to evaluate production times, materials usage/wastage, costs and staff hours. Once benchmarked against other (competitor) data, judgements can be made about the effectiveness and efficiency of operations. Linked to this will be data derived from inbound and outbound logistics (see Value Chain), and quality systems. In the service sector, "production data" may not be so easy to evaluate, so measurement of customer feedback and customer complaints are two methodologies used to evaluate the quality of the service.

Other functional areas

In the functional areas listed above, we have also mentioned:

- information systems (MIS and IT)
- human resource management (HRM)
- research and development (R&D).

Each of these functional areas will form part of the internal activities of the organisation, utilising information to manage resources to contribute to sustaining the business. Based on Porter's Value Chain, information systems (MIS and IT) are intrinsic to the infrastructure of the organisation and considered extensively throughout this study guide.

HRM has a support role for every part of the business. A vital and sometimes influential service, HRM uses data management for the operational and management activities of employee services and personnel support for the rest of the business. It is less usual for this function to take a strategic lead in organisational directional decisions – its role tends to be a background support for more outwardly-facing aspects of the business.

Propositions recommended by R&D however, can lead to a "sea-change" for the business and without doubt such proposals will have to be justified with the support of robust data. The R&D department has a very specialist role to play in any organisation, and for some, such as pharmaceutical companies or science-based organisations, R&D is a core (primary) activity.

Quality management

> *A quality management system (QMS) is a collection of business processes focused on consistently meeting customer requirements and enhancing their satisfaction. It is aligned with an organisation's purpose and strategic direction*
>
> *ISO 9001 (2015)*

The purpose of **data retrieval** and analytics in the business environment is to measure and then prove or disprove the effectiveness of decisions made. Quality management systems including accredited standards, such as ISO 9000, Total Quality Management (TQM) or Six Sigma, are designed to ensure the organisation has robust systems in place for the effective production of goods and services – although the focus was historically based on manufacturing, quality management (QM) has been adapted for the service sector.

As the quotation indicates, these are process-driven standards. Six Sigma standard is a good example of where the defined process leads to a quality methodology for analytical decision-making. Six Sigma is an approach developed by Motorola in the 1970s and based on **statistical process control (SPC)** designed to eradicate performance deficiencies and enable quality improvement. In this case, the steps taken are based on the DMAIC approach:

- **Define** the problem;
- **Measure** the data;
- **Analyse** the problem;
- **Improve** the process by removing the causes of the problem;
- **Control** to prevent the original problem for recurring and to maintain the benefits of the changes made.

The quality standards check that not only are the processes in place but also their practice and effectiveness can be measured. Success means the business gains valuable accreditation, which in many cases may mean access to (international and national) contracts, which would otherwise be denied. Accreditations are audited regularly and re-evaluated. A core principle for accreditation is not only that processes are in place, but that data related to those processes are VACS.

2.4 Data sources in contemporary contexts

Data research with purpose

Whilst technology enables continuous collection of large amounts of data, effective extraction, analysis and interpretation is dependent upon: a) understanding the purpose to which this information is to be used (the brief), b) the amount, variety of methods and types of data to be incorporated into the final report with recommendations for future decision-making, and c) speed of access, reporting and quality and consistency of comparison and presentation. In summary:

- The nature and purpose of the research may be: routine or non-routine; continuous, periodic, occasional or specific; regularly or occasionally reported or commissioned; operational, management or strategic.
- Types of data include: qualitative, including intelligence and opinion; quantitative, including statistics derived from primary research (e.g. internal customer survey data), which and/or secondary, collated from continuous sources or commissioned using own or market intelligence organisations; historic, predictive and prescriptive. Statistical analysis will be both **descriptive** (based on averages – mean, mode or median) or **inferential** (based on deductions from the outcomes of tests).

Whilst too little reliable data will be an issue, the timetable for undertaking the required research may limit the depth and quantity of work undertaken. Overdue reporting may come too late to be used for effective decision-making.

However, generally, if data is VACS, appropriately measured and benchmarked with comparison, business decision-making can be made with some degree of confidence.

Risks with data validity

Throughout this chapter, concerns have been raised about the sources of data and their efficacy in a dynamic business environment.

Research specialists suggest that some form of continuous "testing" helps to create a degree of certainty. For the decision-maker checking the source and content of information for its validity, the following questions may be pertinent:

Is the data reliable? If the same information or the results of an experiment are repeated on several occasions and with a sufficient sample, there is some degree of reliability and consistency – although variations of circumstances might render differences in outcomes.

Is the data valid? This refers to the credibility of the research:

- Internal validity is concerned with the instruments (tools, methodologies and techniques) and the process undergone to achieve the results.
- External validity considers whether similar outcomes will be reported when the instruments are used during external research.

As important, has there been sufficient research undertaken to provide consistency and substantiate the outcomes proposed?

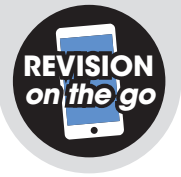
The first chapter recognised that for the decision-maker, there are many uncertainties surrounding contemporary data, their sources and management. Technology has ensured that more individuals than ever will have access to a breadth and depth of data completely unknown to previous generations. Even school children are able to garner information on topics from the widest number and range of sources.

Whilst BI applications are designed to facilitate data collection, analysis and interpretation, difficulties arise when the efficacy of the core information, providing the basis of the analysis, comes under question.

Doubts about internet sourcing

"**Lack of accurate and proven data** – despite the vast amount of data sourced through the internet, this media can be subject to **inaccurate reporting** and interpretation as well 'malicious' **misinformation** (note: the recent development of phrases such as **'false news'**, or **'post-truth'** – where information is 'cherry-picked' to match a chosen viewpoint)."

(Chapter 1)



Thus, much information, particularly if derived from third party sources or secondary research for alternative purposes, has to be treated with caution and scepticism. Equally, there is a danger that an apparent lack of sufficient, substantiated data, considered both reliable and valid, can lead to decision-making inertia, particularly if a risk-averse culture pervades. Given the demands for transparency, managers often appear reluctant to make decisions for fear of blame.

For the safety-cautious decision-maker, this scepticism or fear of risk may be mitigated by substantive research methodologies. These are designed to check and re-check findings, ongoing data collection and interpretation to ratify recommendations and/or once decisions have been made, a simple assessment and subsequent monitoring of the outcomes to confirm the value of assessment.

OVER TO YOU

Activity 2: Checking data validity

Research the website of a global company with which you are familiar (e.g. a car manufacturer such as Toyota or a global energy company such as BP). Your research should focus on all the facets of the business and its activities covered on the website, including: marketing, values, financial reports and contemporary issues, such as corporate governance and social responsibility.

1 From your knowledge and experience, would you agree with the company's statements about its activities and its results?

2 What else would you like to know?

3 What other evidence or sources of information can you use to validate the company's statements about it activities? Be specific.

4 Research some of these sources. Does the information tally with what is put on the website or does it raise questions?

Remember: "Many companies view their annual report as a potentially effective marketing tool to disseminate their perspective on company fortunes." (http://www.inc. com/encyclopedia/annual-reports.html)

Contemporary issues

Other issues for consideration by the researcher in pursuit of BI concern are regulatory or ethical compliance. Different countries (national cultural and legal contexts) take a different approach to investigation and information sourcing. In some cases, innocent research can lead to difficulties, even danger in sensitive political climates. It is essential that the researcher is aware of individual restrictions and is compliant with the legal requirements for data access in a variety of industry and national contexts. Some issues of concern are:

- Online security protection – this includes not only security of individual customer personal details (e.g. bank accounts and passwords), but also acquisition of unauthorised market and political intelligence – note the increasing occurrence cyber-attacks for both political and business reasons, for example.
- Specific industry and organisational intelligence including reliability of sources, **whistleblowing** policies, legislation – whilst all organisations must abide the legal requirements of a particular country, businesses, including specific markets, also have regulatory frameworks for which there will be penalties for non-compliance. Ethical behaviours may not always be regulated, but codes of practice often determine expected behaviour and an organisation breaching these may expect negative impact on brand and corporate reputation.
- Ethical standards applied to information and intelligence gathering and use of data including use of incentives (opinions on bribery and corruption) also differ in different contexts. It is important, where applicable, for the analyst to familiarise themselves with national customers and practise in this respect.
- Costs of knowledge acquisition and the timeliness of its acquisition – data may be expensive to acquire; it moves fast and information gathered can soon be out-of-date or irrelevant.

READING LIST

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http://softwareadvice.com

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https://go.oracle.com

www.hsbc.com/investor-relations

www.ibm.com/business-intelligence

https://powerbi.microsoft.com/en-us/what-is-power-bi/

https://sap.com/uk/solution/platform-technology/analytics/business-intelligence-bi.html

www.qlick.com/en-gb

Summary

Chapter 2 has focused on the role of information in analytical decision-making. There has been discussion on the types of business information systems an organisation might use, and how these can be structured to provide VACS information for use by the business analyst and his/her internal or external client.

Recognition is given to the increasingly high profile role of BI and the impact of technologies to access and analyse vast amounts of data through software applications companies, who provide a comprehensive service and bespoke software to aid organisations in data management.

The purpose of researching and interrogating data and the business context is all important to ensure that data is managed in an appropriate format for each functional area, including marketing, (e.g. market research and CRM activities), financial accounting and reporting, supply chain management, internal and external data sources. All of these elements are important to gain competitive advantage.

Consideration has also been given to the validity and reliability of data which may inform decision-making or, indeed, hinder it. Some degree of risk management is suggested to mitigate some of the problems that may be encountered within a dynamic and contemporary business environment.

Chapter 3

Analytics in Practice

Introduction

Project management

> *A project is a unique, transient endeavour, undertaken to achieve planned objectives, which could be defined in terms of outputs, outcomes or benefits. A project is usually deemed to be a success if it achieves the objectives according to their acceptance criteria, within an agreed timescale and budget.*
>
> *Association for Project Management*

This chapter turns knowledge into practice. Using **project management** methodology, the purpose is the development of skills to apply information collection, analysis and interpretation tools and evaluative techniques within the context of a business management scenario to enable production of an appropriate report to meet the requirements of a project brief.

You will be guided through a step-by-step process (with hints and tips) consisting of planning, research design and information collection, followed by analysis and interpretation of the findings. Finally, in this chapter, you will be asked to consider the risks related to the project findings.

Learning outcome

On completing this chapter, you will be able to:

3 Prepare evaluative reports to meet the requirements of a specific project brief.

Assessment criteria

3 Prepare evaluative reports to meet the requirements of a specific project brief.

3.1 Plan the collection and analysis of information required for a business decision-making project.

3.2 Design, collect and collate appropriate data to meet requirements of a business decision-making brief.

3.3 Analyse complex data sets using a range of techniques from a range of sources to support project brief.

3.4 Interpret complex data from varied sources to enable coherent reporting in response to a specific brief.

3.5 Assess and reflect on risk factors when reporting against the project brief.

3.1 Plan the collection and analysis of information required for a business decision-making project

Step one: understanding the project brief

Any form of investigative and analysis task requires understanding of the purpose of the investigation and some idea of the project's initiator's intentions when commissioning the research. This normally takes the form of a formal (written) or informal (verbal) briefing. The project brief is designed to confirm and clarify the expectations of the initiator (principal/client) and at the very least should contain information relating to the following:

Project definition – explanation of what the project needs to achieve.

Background – the business activity to which the project relates to, including its context and why the project has been commissioned.

Project objectives – **SMART objectives** including time, cost, quality, scope, risk/benefit and performance goals.

! NEED TO KNOW

If you're not already familiar with the term, "SMART" stands for: specific, measurable, achievable/agreed, realistic and time-bound. An example of an internal routine SMART objective for an analytical project may be "An analysis of staff turnover in the company over the past three years." Delivery of the project itself may also be a consideration when developing SMART criteria; so, for example, "Market trends in new product development from 2015–2020 are to be presented to the board on xx/xx/201x." Both these examples are:

- specific – focused on a particular aspect of the business;
- measurable – quantitative data of staff turnover and historic and predicted trends;
- agreed – client/initiator-led;
- realistic – it realistic to expect the data will be available, and
- time-bound – a specific date for the period of investigation and submission data.

Desired outcomes – ideally, what would the initiator like to see as the results?

Project scope and exclusions – parameters in which the project operates. For example, is the project regarded as strategic, managerial or operational? Does the level or specific context

influence the type of research to be undertaken? Is the project routine or a one-off? Are there areas which should not form part of the research or cannot be used for some reason?

Constraints and assumptions – inevitably, there will be limitations on the research – these can be about time or cost of data collection. Equally, it should be clear what assumptions or expectations the commissioning agent might expect from the project manager. It is best to spell these out from the start to avoid miscommunication or other misunderstandings.

Project tolerances – particularly significant when the project relates to engineering or construction in which time, cost or physical tolerances may need to be considered or other risk factors taken into account.

Thus the first task of the project manager (PM) is to read and then re-read followed by dissection of the project brief to fully understand its requirements. Once established, it is then useful for the PM to confirm understanding in writing to the principal/client.

To guide you through the steps of undertaking a knowledge-based business project, we will be using Nestlé (www.nestle.com) for the main case material.

CASE STUDY: PROJECT

Nestlé in Society

Providing safe, quality nutrition for more than **150 years**	**2 000+ brands** worldwide	Around **328 000 employees**
Number of countries we sell in **191**	**418 factories** in 86 countries	**CHF 89.5 billion sales** in 2016

Nestlé is one of the oldest, largest and most successful global food brands. Products include baby food, water, cereals, coffee, chocolate, confectionery and dairy products, and its sub-brands such as Gerber, Perrier, KitKat, Nescafé and Haagen-Dazs – to mention a few – are also internationally renowned.

As with all global organisations in the 21st Century, Nestlé is expected to comply with corporate governance regulations, ethical standards and to take corporate social responsibility and environmental sustainability seriously. Nestlé promote themselves as "the leading Nutrition, Health and Wellness Company" and produce an annual report on the website titled "Nestlé in Society". The report considers:

- shared values strategies;
- contribution to the global agenda;
- nutrition, health and wellness;
- rural development, water and environmental sustainability;
- people and human rights;

- material issues;
- stakeholder engagement.

http://www.nestle.com/asset-library/documents/library/documents/corporate_social_responsibility/nestle-in-society-summary-report-2016-en.pdf

OVER TO YOU

Activity 1: Step one: project brief – Nestlé

Scenario

You are part of a team that has been asked to report on Nestlé's performance in the area of CSR. You have been asked to prepare a plan, source the data and analyse it with interpretation of the key findings. You will also present a summary supported by analysis for scrutiny by your manager, who requires all monetary values to be in US Dollars ($).

The main source of information will be through Nestlé's website, in particular the report titled "Nestlé in Society", (available at http://www.nestle.com/asset-library/documents/library/documents/corporate_social_responsibility/nestle-in-society-summary-report-2016-en.pdf but you may wish to consider third party published research to expand your research.

Tasks

1 **Read through the material on Nestlé's website; become familiar with it, highlighting areas in the text which may be of interest or require extra research. You should consider all the aspects of the information provided.**

2 **If possible, check any points about the project brief which may not be clear to you at this stage. For example, you should check with your tutor on the timelines for delivery of this project.**

Step two: developing the project plan

Once you have read the project brief thoroughly and understood what is required, you will need to plan your project carefully to ensure you meet the objectives and on time.

Before commencing the development of the project plan, undertake some prior research which will include study of the company website, its reports, any procedure manuals and other documentation to hand which may be appropriate, and the organisation chart.

Once familiar with the company or part of the organisation which is to be the focus for your project, you should plan:

1 The **deliverables** – what needs to be researched and analysed:
   - a data collection and methods
   - b calculations in terms of data analysis against the brief and interpretations
   - c reporting and presentation

2 **The schedule** – a timetable for undertaking each of the tasks to be undertaken to meet the deliverables above.

There are a number of project planning tools available on the market, such as Microsoft Project or **Gantt charts**. Often completely online and a "one-stop shop", it is possible to plan large or small projects, assign tasks, link tasks and compare task completions – planned versus actual.

Project management software

"Project management software is software used for project planning, scheduling, resource allocation and change management. It allows project managers (PMs), stakeholders and users to control costs and manage budgeting, quality management and documentation and also may be used as an administration system."

Techopedia

A simpler and perhaps more accessible method is to create a table by formatting a spreadsheet to schedule your project. In this case, you should put timelines (dates or weeks/months) at the top with activities broken down on the left, using coloured shading for your plan of activities, which can be shaded again to denote completion.

Project plan for research using spreadsheet software

	Activity	Start	End	W1	W2	W3	W4	W6	W7	W8	W9	W10	W11	W12	W13
	Data collection														
1	XXXXXX XXXXXXX														
2	XXXXXX XXXXXXX														
	Analysis and interpretation														
3	XXXXXX XXXXXXX														
4	XXXXXX XXXXXXX														
5	XXXXXX XXXXXXX														
	Reporting and presentation														
6	XXXXXX XXXXXXX														
7	XXXXXX XXXXXXX														
8	XXXXXX XXXXXXX														

Figure 1: Example: schedule format

OVER TO YOU

Activity 2: Step two: project planning for Nestlé CSR

1 Draft an outline project plan with timelines for the Nestlé project (you will need to review once you have refined some of the steps for completion of the project).

2 Make sure you identify each activity or sub-activity, allowing an appropriate timeframe within the time allocated for the whole project.

3 You can overlap activities, but be realistic about how long it is going to take you.

4 Check you have not omitted anything. Your "client" will need to see this outline and will expect you to keep to the tasks and timelines you have provided.

3.2 Design, collect and collate appropriate data to meet requirements of a business decision-making brief

Step three: researching the sources

The next stage in the process is to undertake the research required for the project. As with any research project, this will involve a number of stages:

1 Research design

A core part of the planning process is the design of the investigation. Pride and Ferrell (2007) consider that decisions about design stem from the core purpose of the project brief. They suggest

that these can be classified into two categories: a) exploratory research, which is investigative but generally vague with outcomes uncertain, or b) conclusive, where the purpose is likely to be specific, verifiable and lead to decisions on taking an explicit course of action. Business decision-making generally falls into the latter category and as such should be as comprehensive as possible given identified constraints such as time or access to information.

Research is divided into two main types of investigation:

- **Primary research** – undertaken for a specific purpose or to answer a particular question (or commissioned brief), it encompasses original research, not previously undertaken. Over the course of a project, primary research will be used with a variety of techniques to gather and test data, both quantitative and qualitative, often for confirmation of findings or to provide follow-up or supplementary evidence.
- **Secondary research** – uses information originally researched for other purposes, but which may be publicly available; for example, an industry or government report on a particular topic, relevant to the investigation.

Some widely used research methodologies are included in Table 1 below.

Type of research	Type	Techniques/sources (examples)	Comments
Primary	Qualitative	• *Interviews* – impromptu or planned; staff or customers • *Workshops/focus groups* – e.g. staff or customers • *Observation* – e.g. in a workforce productivity investigation • *Questioning* – best with discussion	Flexible and potentially open-ended; for in depth research and opinion gathering and to supplement quantitative analysis. Requires careful planning and interpersonal skills to get the most out of an event.
	Quantitative	• *Surveys* – customer feedback surveys (online or physical) • *Activity sampling* – data related to work methods or customer purchase preferences • *Special purpose records* – tracking data of a particular type or purpose for analysis • ***Pilot testing*** – trying out new products or samples in a controlled test – sample or type (laboratory)	Objective and enables a quantitative mass of sampling to give validity. Can be analysed numerically – so is statistically based. Appropriate sample size and targets may be difficult to achieve leading to potentially inaccurate interpretations of results.

Type of research	Type	Techniques/sources (examples)	Comments
Secondary	Company-based	• *Internal records* – e.g. financial, operational, marketing, HR and operations records, customer records (sales, profiles) • *Annual reports* (and accounts) • *Websites*	Although gathered for a particular functional area of the business, these records can be valuable when interpreting historic performance and predictions for the future.
	Market-based	• *Competitor and supplier data* • *Market segmentation* • *Industry/market reports* – e.g. Mintel • *Trade press* • *Stock exchange information (share values)* • *Third party company evaluation reports* – e.g. Dun & Bradstreet, Experian	Widely collected through trade or for specific business intelligence particularly in a competitive market. Although subterfuge may play a part to misguide competition, results are largely accurate and provide a guide on trends in the sector. Current incumbents of the sector will be largely and accurately aware of trends and patterns.
	External reports	• *Country/government reports* – e.g. political, economic data, socio-demographic trends, environmental reports, corporate governance and CSR reports – Office of National Statistics (ONS) • *Statutory regulations*	The best secondary sources for global and multi-national economic activity, providing a potentially coherent view. It is important that cross-checking and like-for-like analysis is considered to avoid inaccurate reporting or interpretation.
		• *Financial reports by country* – e.g. Business Evaluation Risk Index (BERI), Moody's, Standard and Poor • *International/global reports sources* – e.g. UN, OECD, EU, World Trade Reports **(WTO)** Global Business Reports (GBR)	

Table 1: Research types

There is a difference between qualitative information (largely descriptive, unstructured and may capture how respondents may think or feel) and quantitative data (based on analysis of numbers or statistics).

In a survey, for example, quantitative data can be measured from straightforward closed questions (requiring yes/no answers) or those based on multiple choice. However, a more accurate response may be gleaned from an open-ended question such as, "How do you feel about the product or service?" Inevitably, respondents will give many different answers and this may be difficult to measure. A scaling of responses such as ''excellent > ''extremely poor" or ''completely agree" > ''completely disagree" will help, but do not give reasons for judgement.

Note that use of numbers to analyse a particular situation is a preferred option, because by definition it is quantifiable and less subject to conjecture. In fact, frequently, attempts are made to analyse qualitative data with the use of scaling (above), ratings and weightings (numeric measures), on which to base judgements.

Sampling

No data collection, unless based on a 100% sample, can ever be 100% accurate. Effective data collection can be time-consuming and costly to administer. It is the role of the analyst to design a sampling frame of data collection to ensure responses can be as accurate as possible within the time and cost limitations. The more "global" the project, the harder this will be to achieve.

A number of techniques (all with varied levels of risk of inaccuracy) can be used to limit samples to a manageable level. Examples of quantitative sampling may include:

- Random (probability) – a list of possible respondents, from which certain people are randomly selected. Whilst there is no bias and the sample is "statistically pure" results are likely to be inaccurate.
- Stratification – respondents are selected from a "master-list" based on specific characteristics, e.g. age, gender or other demographic factor. This give a much more accurate approach and lends itself to comparisons to build up a picture or preferences.
- Clustered samples – drawn from a geographic or other location – possibly as a second level sample after stratification.
- Quota – somewhat random in practice, but in this instance a defined number of respondents is sought either from a specific group (stratified) or as a percentage representative group to reflect the population mix as a whole.

2 Data collection

- Identify the main sources of information considered to be the most useful for your project. These will be the primary or "must use" data, but you will find as you examine these, further sources will merit exploration.
- The purpose of most data collection using a variety of methods is to establish patterns – trends and behaviour (e.g. consumer behaviour). Therefore, the research study will be seeking trends to confirm outcomes – using data mining and machine learning, for example, are methods to establish patterns in behaviour.
- Whilst optimal research design will involve as many different methods as possible, recognition must be given to practicalities – it may not be possible to access appropriate sources, or it may be prohibitively expensive or time-constrained. Data may also be contradictory or confusing. However, there are some guidelines that help determine the approach to research and the most useful data to collect within the limitations of the project brief.

Data collection – hints and tips

Primary research

1 If you are using surveys or questionnaires, make sure your questions are succinct, not long (10–20 questions, but 5–10 minutes maximum) and ask what you **want** to find out? Make sure you don't use just closed questions (i.e. simply requiring a "yes" or "no" answer). Test this out before you undertake the complete survey.

2 Make sure each part of your primary research supports the rest – questions and surveys should be linked with each other and also with the secondary research.

3 Plan interviews, focus groups or workshops carefully to ensure you can guide the questions or discussions to ensure you find out what you are seeking. Don't allow the participants to digress; record any observations, interviews, etc. for future reference. Make detailed notes.

4 Sample sizes are important – the greater the sample, the more accurate the outcome is likely to be. If this is not possible, then use the sample for confirmatory purposes or to provide a check/balance for other research collected.

Note: Survey Monkey offers some practical tips on designing primary research. (https://www.surveymonkey.co.uk/mp/survey-guidelines/)

Secondary research

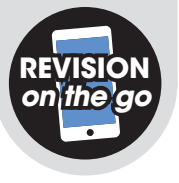
1 The best secondary research is that published by the company itself (on its website). Learn to read the meaning behind the published message, and make sure the tone of, say, its annual report including financial and CSR reports, are consistent with the marketing message and its brand reputation. If a future strategy plan has been published, how likely is it to come to fruition? What is the company's track record for achievement?

2 Use other market or comparative-based sources, e.g. competitors, supplier information, trade press and business reports to confirm the company's position. Are market reports and stock exchange performance for example, compatible with the message the company is communicating itself?

3 International or global economic reports are useful to establish trends for individual countries and to set the tone for future developments?

4 Check range, date parameters and context of secondary data particularly when information is being used for comparison. In other words, are measurements based on like-for-like information?

5 Check whether information is based on fact/statistics or founded upon opinion/prediction.



3 Collation and organisation of information

The final aspect of this section on research concerns its organisation. Data collection is a time-consuming business and inevitably throws up issues and anomalies that may cause the researcher to digress from the central purpose of the brief. Given the range of data sources and collection

methods (including recordings for primary research, paper-based information, statistically-based data and editorial comment), it is essential therefore to remain on-track and also not to "lose" sight of data already collected.

Develop a structured approach to data collection management. Companies involved in BI will often use collection systems such as a multi-domain master data management systems (e.g. Stibo Systems), which are designed to collate and integrate all aspects of the operational activities of the business. We have already established that using techniques such as data mining and **machine learning** can help the analyst to develop patterns of data.

Within the specific context of the research project, it will be necessary to organise such data together with the source materials from both primary and secondary research into a "catalogue". This makes it easier when referencing or if you need to investigate these sources further.

Data cataloguing

Setting up a simple catalogue list will help you access your information and data more easily. You can set up a table in the spreadsheet package which may look something like this:

	EXAMPLE 1	EXAMPLE 2
Date	*xx/xx/20xx*	*xx/20xx*
Title	*Behaviour research*	*Report on xxxxx xxxxx xxxx*
Author/source	*Self*	*Dept for xxx*
Publisher/reference	*fite:xxx/xxxxx/02*	*www.xxxx.com*
Description	*Online survey results dated xx/xx-xx/xx*	*National Annual Report*
Type	*Primary*	*Compilation*
Date accessed	*xx/xx/20xx*	*xx/xx/20xx*
Comment	*Conducted through xxx surveys. Low sample response*	*Actual data is old but predictions on population trends useful*
Key words	*Product range; opinion*	*Demographics, xxx, xx*
Tagging	*Summary p3*	*ch2 p3415–20*

Figure 2: Example: cataloguing research

Note: make sure you fully reference your sources. You will have to include this in your final report and at this stage it is easier for you to retrieve the data if you have referenced it correctly.

You may wish to separate essential reference sources from the supplementary ones.

Make sure you include key words so that you can search effectively and tag references of particular interest.

OVER TO YOU

Activity 3: Step three: collecting and collating your data

Re-read the scenario for Nestlé, then:

1 **Collect as much data as you can from the website, in particular the section "Nestlé in Society".**

2 **Source other reports on the topics. *Hint: Search the internet for reports from OECD or United Nations.* Other useful sources are newspaper articles on the company and related subjects.**

3 **Devise a short, informal questionnaire for discussion with a small group of colleagues, friends or relatives. The purpose of the questionnaire is to ascertain the public's understanding of the issues and Nestlé's approach to them.**

4 **Make a catalogue of all the sources you have used so far.**

5 **Review your project plan and update.**

3.3 Analyse complex data sets using a range of techniques from a range of sources to support project brief

Step four: analysing data

According to Six Sigma's DMAIC process (discussed in Chapter 2.3), the next stage is measurement and analysis of the data collected. If BI software is available, much of the work can be completed by interrogating extensive data input and the results using data mining and machine learning techniques, which can be very useful in presenting almost complete modelling for interpretation by the business analyst. This is particularly relevant were numeric data is being interrogated; however, the systems also use methods to quantify qualitative data that can be incorporated effectively in the overall outcome measures.

However, this type of methodology is not always available, particularly for more traditional sectors/businesses and SMEs (small to medium-sized enterprises) and therefore more conventional techniques should be used – although even small companies have technological access to quite sophisticated analytical tools.

Measurement

Quantitative methods

Babie (2010) describes quantitative data as "the numerical representation and manipulation of observations for the purpose of describing and explaining the phenomena that those observations reflect".

Known as Business Maths, analysts use a range of standard mathematical techniques in operations and inventory management, marketing and sales forecasting, and financial and accounting to measure numerical data input from operational activities. These day-to-day activities are often supported by specialist software applications designed for data interrogation, to build statistics for use as part of the analysis process.

In any event, the business analyst will need to understand the fundamental processes of analysis in the likely case that anomalies or errors exist. Measuring numeric or quantitative data requires skills in numeracy, aided by calculators and spreadsheets.

Quantitative data is usually measured in terms of totals, averages and percentages.

Averages and other calculations

$$\text{Mean} = \frac{\text{sum of values}}{\text{total number of cases}}$$

Mode = most frequently occurring attributes

Median = middle attribute in observed sample

In spreadsheets, function keys will be able to calculate these ratios for you. An Excel spreadsheet screenshot is shown on the next page.

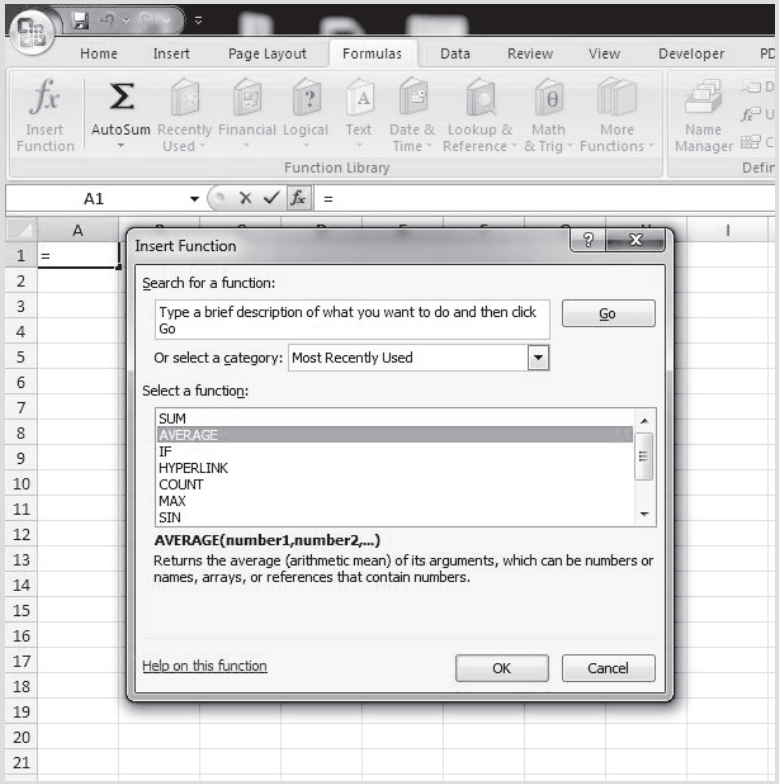


Figure 3: Function keys

In every aspect of the business, these quantitative data measurements are used to develop understanding of performance in areas such as marketing, operations and human resources. In each case, specialist software exists to facilitate this process. Marketing calculations might include: number of hits on a website, sales conversion rates by number of store visits, analysis based on customer repeat business or complaints.

Financial and accounting measurement

The ability to measure financial performance is core to assessment of the business' overall competitive position and is worthy of a separate discussion. Accounting software is readily available even for the smallest business.

CASE STUDY: ACCOUNTING SOFTWARE

Quickbooks

Quickbooks is an example of all-in-one accounting software, which the small business can use to record all its accounting activity. According to its website, Quickbooks:

1. Captures expenses on the go.
2. Reduces data entry by downloading bank transactions automatically.
3. Improves cash flow by tracking unpaid invoices.
4. Ensures tax compliance.
5. Provides "real time" dashboard to check performance.

Source: www.quickbooks.co.uk/

From your previous studies, you will know that internationally accepted accounting ratios are used to evaluate business financial performance. The most usual ratios measure **profitability** (derived from the annual profit and loss account to determine the organisation's ability to make a profit from its activities and give shareholders a return on their investment) and **liquidity** (sourced from the balance sheet), which measures the company's capital, cash reserves and its ability to pay its bills and maintain its commitments.

Accounting ratios

Key ratios include:

Profitability ratios	
Gross profit margin =	$\frac{\textit{gross profit}}{\textit{revenue}} \times 100$
Gross profit mark-up =	$\frac{\textit{gross profit}}{\textit{cost of sales}} \times 100$
Net or Operating profit =	$\frac{\textit{operating profit}}{\textit{revenue}} \times 100$
Overheads in relation to revenue =	$\frac{\textit{overheads (expenses)}}{\textit{revenue}} \times 100$
Return on capital employed (ROCE) =	$\frac{\textit{operating profit}}{\textit{capital employed}} \times 100$
Liquidity ratios	
Net current asset ratio =	$\frac{\textit{current assets}}{\textit{current liabilities}}$
Liquid capital ratio =*	$\frac{\textit{current assets – stock}}{\textit{current liabilities}}$ *also known as the Acid test
Inventory turnover =	$\frac{\textit{opening stock + closing stock} \div 2}{\textit{cost of sales}} \times 365$ days
Capital structure ratio (%) *Gearing =*	$\frac{\textit{debt (loans + preference shares)}}{\textit{equity (reserves + ordinary shares)}} \times 100$

Table 2: Financial ratios

Ratio analysis is used by companies in their annual reports to summarise and highlight changes or trends in year-on-year performance. It is important to note that the complexity of activities including diverse income streams and especially those related to investments and group/SBU management, the level of detail, particularly for individual subsidiaries within a global conglomerate and even terminology used in the financial statements may differ. The accompanying notes to these statements and summary reports from chief executives and directors are a valuable help in understanding the outcomes.

You can access Nestlé's annual report 2016 on its website (http://www.nestle.com/investors/annual-report). Scroll down to the 'Financial review' for an overview of key financial headlines. The ratios above have been used to provide additional interpretation of the trends in Nestlé's performance between 2015 and 2016. It is important to remember that analysis of comparisons year-by-year should be made on the basis of like-for-like data. Figures quoted are in CHF (Swiss Francs).

CASE STUDY: ANALYSING PERFORMANCE

Nestlé Results 2016

Summary

Financial review

Our 2016 organic growth was at the high end of the industry but at the lower end of our expectations. We saw a solid trading oprating profit margin improvement and our cash flow grew significantly.

CHF 89.5 billion Sales	**3.2 %** Organic growth	**2.4%** Real internal growth
CHF 13.7 billion Trading operating	**15.3%** Trading operating profit margin	**+30 basis points** Trading oprating profit margin (Constant Currency)
CHF 2.76 Earnings per share	**+3.4%** Underlying earnings per share (Constant currency)	**CHF 15.6 billio**n Operating cash flow (112.0% of net financial debt)
CHF 10.1 billion Free cash flow	**CHF 2.30** Proposed dividend	**+2.2%** Proposed dividend increase
44.9% Of total sales are from geographic area AMS	**30.0%** Of total sales are from geographic area EMENA	**25.1%** Of total sales are from geographic area AOA

http://www.nestle.com/investors/annual-report

Key ratio analysis

Ratios	2016	2015	Comments
Gross profit ***(Sales – Cost of sales)***	CHF 45,270 billion	CHF 44,055 billion	This represents an increase in gross profit on mainstream activities of 2.7% on the year. See comments in summary review above. The company is doing less well than expected but higher than the industry and global GDP (2.2%).
Gross profit margin	50.6%	49.62%	1.4% improvement in 2016. This may not seem much but indicates greater efficiencies in supplier and production management.
Net or Operating profit (%)	14.66%	13.92%	Overall 0.74% improvement on the year. Despite higher GP margins, marketing, distribution and other expenses increased by c0.97% on the year, bring overall improvement lower.
Overheads/revenue	36.6%	36%	Overhead costs as % of revenue have risen marginally over the year showing a decline in performance. These figures should be benchmarked with others in the sector to truly understand the significance.
ROCE ***(operating profit/ equity + liabilities)***	9.9%	10%	Very good returns would be in the region of 15–20%, so this is low and marginally poorer than 2015, but reflects sector and world market generally (see Financial review comments).
Liquidity ***(net current assets: net current liabilities)***	1:1.15	1:1.12	Liquidity may be an increasing problem with current liabilities outstripping net current assets. This would lead to cash flow problems in a much smaller company.
Acid test ***(net current assets – stock: current liabilities)***	1:1.37	1:1.37	Ideally the acid test would produce a ratio of 1:1. This would indicate the company was managing cash flow and was in a good position to pay its way.
Inventory ***(stock turnover)***	68 days	n/a	Would need to benchmark this with other similar organisations. 68 days would seem fair.
Gearing (%)	16.8%	18.1%	Has improved on the year and indicates gearing is of no concern. However, benchmarking against competitors would also be useful.

Table 3: Key ratio analysis for Nestlé in 2016

Qualitative measurement

Qualitative data relates to concepts, opinions, values and behaviours of people in social context that is not easily converted to a numeric form (http://www.socialresearchmethods.net/kb/qualdata.php). Nonetheless, techniques to correlate qualitative data with other similar information, or to benchmark it in some form, will be used to develop some level of quantification and hence confirm validity. So sampling methods, responses to open questions in surveys and document analysis may be difficult to measure mathematically, but researchers use quantitative measures, such as frequency tables or other range statements to develop a quantitative measure to qualitative research. By numerically codifying a qualitative fact (e.g. gender – male and female), numeric data frames can be set up for easy mathematical analysis. By definition, measurement tends to be limited by the quantity of the sample researched as well as the qualitative elements, so general sampling methods are on a much smaller scale than parallel quantitative measures.

Analysis

To provide a sound basis for both quantitative and qualitative analysis, data collection should incorporate both aspects in which the anticipated outcomes will "map" both methods, linking them to find common themes – each supporting the findings of the other.

Approaches to data analysis for both quantitative and qualitative data differ. The table below gives some indication of the differences.

Research aspect	Quantitative	Qualitative
Research purpose	Fixed/focused	Broader, contextual, open-minded, adaptable
Expected outcome	Identified in advance	Rarely pre-defined, emergent
Development stages	Hierarchical and **linear**	Circular or lateral
Contradictory or contingency factors	Controlled by design and analysis	Flexible and searched as an when possible
Timeframe	More detailed, painstaking and slower	Fast-paced initially, but will lose momentum as unforeseen factors are highlighted or more in depth research is considered desirable

Table 4: Quantitative vs qualitative analysis

Given the amount of available data, quantitative analysis will use techniques such as distribution rates, bi-variate and multi-variate analysis, as well as **financial ratio analysis**, and then use data mining and machine learning techniques for large-scale analysis to develop comparative trends in order to build a statistical analysis of the past. That data can then be used to model what may happen in the future, through techniques such as **regression analysis**, which examines the relationship between different statistical variables. (Note: Excel spreadsheets can do all the calculations and outputs – see above: Revision on the Go "Averages and other calculations".)

In qualitative data analysis, the researcher will usually use deductive or inductive approaches:

Deductive – data is grouped for similarities and is best used when there is limited time and resources for the investigation.

Inductive – likely used when qualitative research is a major part of the investigation and the analyst will determine a framework to group data based on the outcomes of the research. In this way, relationships between data – to confirm (or contradict) – can be sought.

As in quantitative research, data comparison/similarity responses, mapping and benchmarking techniques (say, against performance targets) can be used effectively to analyse qualitative data. As we can see from the table above, qualitative data is far less prescriptive and subsequently has a greater propensity for "error" or anomaly, but may give meaning, experience and opinion, leading closer to truth than a more statistical approach.

OVER TO YOU

Activity 4: Step four: analysing data

Use mathematical skills (you can use spreadsheets and calculators) to analyse the data collected from Step three of the Nestlé tasks.

Tasks

1 Compare the 2015 and 2016 data in the "Created Shared Value" (CSV) section of the "Nestle in Society" report (first mentioned in Activity 1 of this chapter). What are the trends? Is Nestlé improving its CSV position and by what percentage year-on-year?

2 You will see progress reports on all aspects of Nestlé's CSR policies. Using those, including pie charts for 2014–16, analyse the data and trends – again calculate ratios and percentages to capture the differences.

3 From your questionnaire in Step three, analyse the findings using numeric measures where possible to understand the responses.

Look at the main annual report and accounts for Nestlé. You will find these on the website here: http://www.nestle.com/investors/results. Also refer to the case study above for further information to support task 4 below.

4 Analyse year-on-year results for 2014, 2015 and 2016, using financial ratios to do your calculations. What are the trends? Is there growth/decline? Are there differences between profitability and liquidity trends? If so, why might that be? Where can you find more information?

Discuss this with your tutor or colleagues if you are studying with a class.

Source: www.nestle.com

3.4 Interpreting complex data from varied sources to enable coherent reporting in response to a specific brief

Step five: interpreting data

Whilst analysis is a process of organising and summarising data into logical, sequential categories, data interpretation is the process of attaching meaning to the information. Therefore, interpretation is a more qualitative process, subject to personal opinion. For the business analyst, the secret is to be able to make reasoned and justified assessments to substantiate the opinion.

> *"**Descriptive statistics** uses the data to provide descriptions of the population, either through numerical calculations or graphs or tables. **Inferential statistics** makes inferences and predictions about a population based on a sample of data taken from the population in question."*
>
> *www.study.com*

In Chapter 1, we discussed the differences between descriptive, predictive and prescriptive data. Descriptive techniques tend to be statements of facts (data driven) in which relationships between similar data sets can be explored. These can be supplemented by inferential statements, which correlate other factors and make predictions. For example:

Descriptive statement – "A company shows growth in sales of 10% year-on-year for the past three years."

Inferential statement – "Whilst this is in line with the market, competition and cost pressures are squeezing margins, so this growth rate is unlikely to continue for the next year."

For the business analyst, there are many tools or models available to provide a framework for interpretation and evaluation of the research. In this section, we will examine a selection (not exhaustive) of better known business models that can be used to support data interpretation.

External model: STEEPLE

An acronym for Social/Demographic, Technological, Economic, Environmental, Political, Legal and Ethical, **STEEPLE**[1] evaluates current and future trends in the external (or macro) environment. By identifying key issues under each heading, the analyst will be highlighting factors to be considered when making strategic, management and operational decisions (e.g. a change in employment law will impact on the HR function of the organisation). STEEPLE factors are considered the "uncontrollable" factors in the business environment affecting all organisations operating within a particular sector. In some cases, powerful global businesses will be major influencers in creating the direction of a particular factor (for example, both Microsoft and Apple have had a major influence on technology and communications).

Market model: **Porter's Five Forces competitive position analysis**

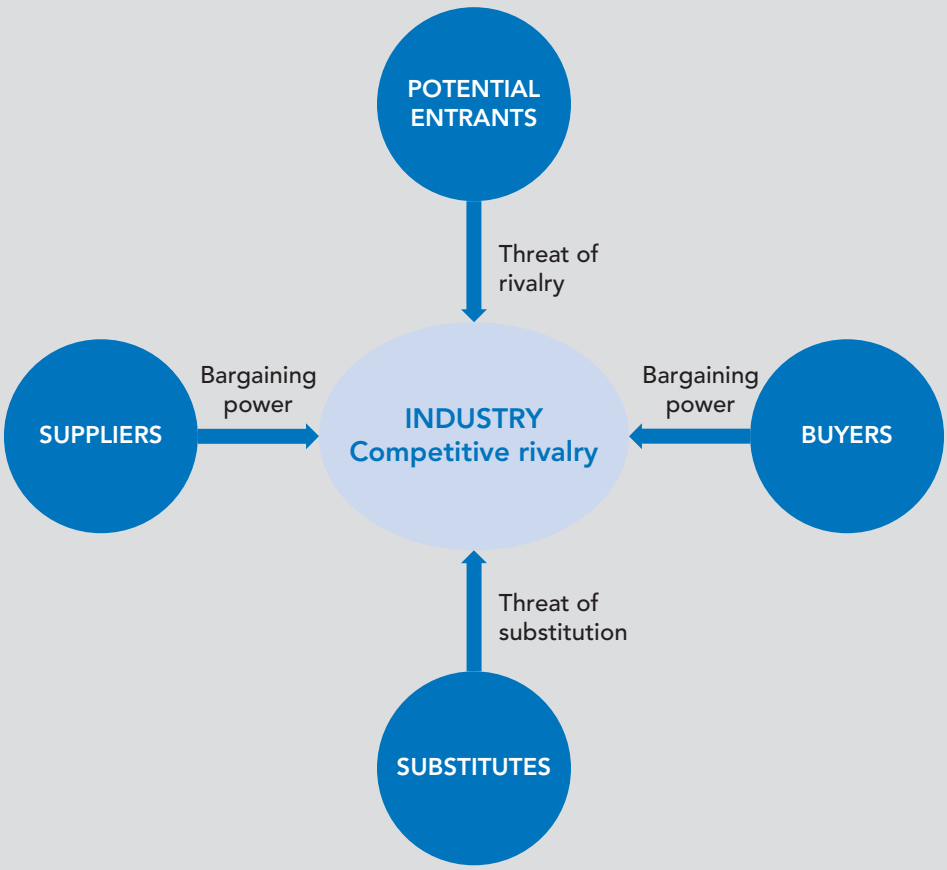


Figure 4: Five Forces Model, from Porter (1980)

Porter's model is based on the assumption that in a competitive environment the organisation is under pressure, not only from direct competitors (competitive rivalry), but also from the bargaining power of the supply chain (for example, few suppliers may have limited availability of a product which will enable a supplier to charge higher prices). Buyers (customers and distributors) may have choices and a wide range of products/competitors to choose from, but in the early stages of a product life cycle their power is diminished due to a lack of knowledge and product availability).

4 STEEPLE has developed from earlier versions – also known as PEST, STEP and PESTEL/PESTLE.

Threats are derived from alternative products; there aredirect and indirect substitutes, such as coffee versus tea (direct) or soda water versus tea (indirect – as one is a cold drink and the other is hot). Other threats stem from new entrants; in a global market or one in the earlier stages of development with great profit potential, there is a real risk of upstaging by large corporations buying an established competitor.

The purpose of the model is to identify what those pressures are under each heading and then evaluate them in terms of "low" or "high" impact. For example, if a company operates in a highly competitive and 'crowded' market, then competitive rivalry will be intense; if there are many suppliers available, their bargaining power may be low.

Porter's Five Forces will be reviewed again in Chapter 4 during the option development phase.

Internal model: resources and competences

When assessing a firm's capability to compete, the analyst will evaluate both the resources (tangible and intangible) and likewise competences of the organisation. Whilst "threshold" resources and competences are the bare minimum required to survive within a market, unique resources and core competences are those factors that "provide the basis to outperform competitors or demonstrably provide better value for money" (Johnson, Scholes and Whittington 2008).

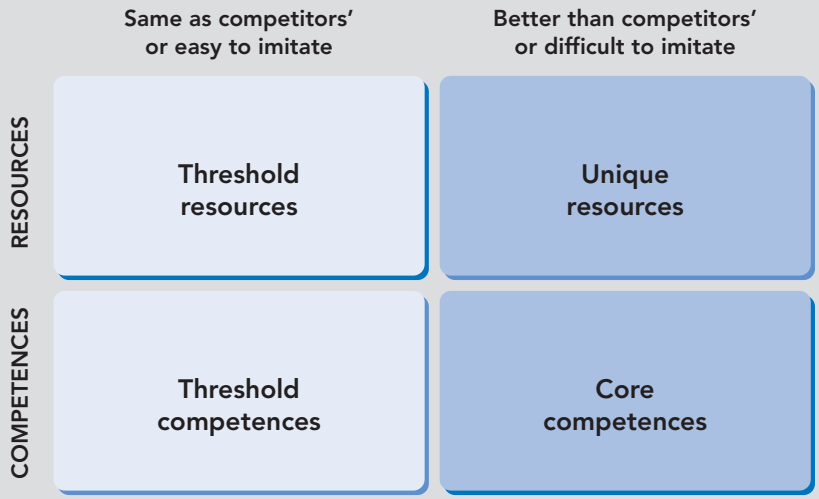


Figure 5: Strategic capabilities, adapted from Johnson, Scholes and Whittington (2008)

Assessment of identified unique resources (through, for example, interpretation of profit and loss accounts, balance sheets and financial reports) and core competences (such as intangibles – intellectual property and brand) is then evaluated on the basis of their unique or special qualities. Therefore, a unique resource or core competence can only be described as such if it provides at least one of the following:

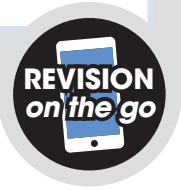
- exceptional cost efficiency;
- superior quality and value;
- outstanding relationship management (e.g. supplier and partnership networks);
- robustness and sustainability (provides a sound long-term basis for success).

SWOT

Equally relevant to the four tests of competitive advantage is an assessment using probably one of the best known tools: a **SWOT** analysis. In this context, SWOT is a summary assessment of an organisation's internal capabilities (strengths and weaknesses) and external factors (opportunities and threats). Drawn from data analytics described in the earlier sections, a simple SWOT lists those key factors which the company can either use to gain competitive advantage, or must deal with if it is to remain viable and/or successful. More sophisticated evaluations of SWOT can be made by giving weightings to the importance or relevance of an aspect on the list and then assessing organisational performance or potential. For interpretation purposes, the secret to creating a useful SWOT analysis lies in the accuracy of the author's evaluation of the company's position. A useful approach to check the relevance of the content is to consider the following questions.

Strengths	Weaknesses
• Is your "value chain" better or worse than your competitors? • Does the company understand what customers' value? • Does your "strength" give added value? • Is it robust? Could it also be a weakness?	• What impact has this weakness on your business? • How relevant and important is it? • Could it also be strength? • Is it a critical success factor? • Is it urgent?
Opportunities	**Threats**
• Is this a "real" opportunity – a gap not exploited? • Where are the opportunities? Existing or new to the world? • **Red** ocean or **Blue** ocean? [5] • Relevant to the organisation? • Accessible? Is it also a possible threat?	• Is the threat strategic or operational? • How important is it? What is its impact? • Does it affect all the competition or is it from the competition? • Could it also be an opportunity? • What's the urgency?

Table 5: Interrogating a SWOT analysis



Synthesising outcomes

At this point, if this has not been considered already, the business analyst should:

- review the original brief to check the information remains within specification;
- reflect on consistency of findings and interpretation;
- evaluate comparative studies, trends and forecasts to support own interpretation;
- consider if other research is necessary/desirable within the limits of the project.

5 Red ocean refers to crowded and competitive markets; Blue ocean refers to potentially unexploited markets – the question is why has it not been exploited? It could be difficulties with accessibility or inappropriate for the type of product or service on offer.

The other consideration is to establish how best the findings can be summarised effectively to directly address the issues raised in the project brief and in a form which is easily "digestible" and supported by fact and justification.

3.5 Risk factors: reporting against the project brief

> *"There are three kinds of lies – lies, damned lies and statistics."*
>
> *attributed to Benjamin Disraeli, British politician*

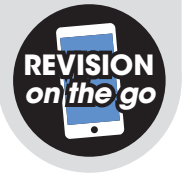
Throughout the study guide and specifically in Chapters/learning outcomes 1 and 2, consideration for risk of quality of data (VACS), appropriateness and quantity of research activities has been highlighted as a real threat to the quality of interpretation and predictions. No project is without risk, and for the researcher there is a danger of "the paralysis of analysis". In other words, uncertainty of the accuracy of data may lead to ever more complex attempts to reach "safe" conclusions. Findings will be subject to detailed scrutiny and scepticism by recipients – we are all aware that data interpretation can be subject to "spin" (i.e. presenting in a favourable light) and the tendency for the author and initiator to use outcomes to correlate and confirm held opinions.

It is important for the analyst to ensure that each step of the process of collecting, analysing and interpreting is examined thoroughly and is verified using analytical methodology and secondary evidence to corroborate findings. These will include:

- considerations for currency, accuracy and sufficiency (VACS);
- validity of using trends (historical and **extrapolation** to forecast and predict futures);
- anomalies – technical issues (such as data input accuracy, process issues) and margin of error;
- consistency of comparative and secondary data sets;
- reliability – fact-based versus opinion, wisdom and intuition;
- anticipated business/stakeholder response to project outcomes.

Be transparent

Discuss inconsistencies and gaps; listen to others. Sometimes cover-ups succeed; other times they do not. In almost all cases, where they do not, the impact is negative – for all parties and trust between them irreparably damaged.



You should also be careful to ensure you remain objective within the remit of the project brief. So part of your planning should consider any potential difficulties that may be encountered and to make certain your project is considered favourably. This will mean considering:

- specific conditions or restrictions (for example, in this project on Nestlé it is not intended you contact the company directly); confidentiality and sensitivity issues;
- limitations – may include timeliness to complete the project, access to data – except for that available through the internet; depth and breadth of data researched given the size of the project; level of completeness and research gaps;

- cost of data acquisition, intelligence gathering and analytical modelling (for example, commissioning a BI report from a sector analyst specialist using modelling software might be easiest and most effective, but might be prohibitively expensive and may not be deliverable in the timeframe);
- checks and balances – allowance for time and peer support to review the project prior to completion;
- potentially controversial findings – could lead to the project being discarded (and your reputation damaged);
- BI software is only as good as the input – it may misinterpret as it is only data driven;
- lack of large-scale data for manual calculation.

OVER TO YOU

Activity 5: Step five: interpreting data

Using the data analysis of Nestlé in Step four, you are now required to interpret your analysis of Nestlé's position financially and also in respect of its CSR policies. You will also need to apply models such as STEEPLE and the Five Forces model to build your analysis

1 Nestlé promotes itself as "the leading Nutrition, Health and Wellness Company". Assess this claim.

2 What data and other credible sources, from your analysis would:

a) support this view? Justify and give evidence.

b) contradict this opinion? Again, justify and reference sources appropriately.

3 What, if any, anomalies or contradictions have you found that would merit further investigation and interrogation of the research?

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Summary

In this chapter, you have been taken through a step-by-step approach to analytics in practice:

Step one: understanding the project brief

Step two: developing a project plan

Step three: collecting and collating the data

Step four: analysing the data

Step five: interpreting the data.

The real-time case material found on Nestlé's website should have given you valuable practice on how to undertake these five steps, but it has also been recognised that no investigation of this nature will be 100% in terms of coverage and completeness – there is risk of anomaly and contradiction. Such limitations should be recognised in the reporting process.

Chapter 4

Option Development

Introduction

> *Business analysts play a crucial role on project teams from the start. Their role is to research, analyse and synthesise information leading to innovative solutions.*

https://www.zs.com/pdfs/ZS/FocusSheet-BusinessAnalyst.pdf

ZS Associates, a global consulting firm specialising in pharmaceutical and healthcare in Europe and working across international boundaries for most of their projects, go on to say:

"In close collaboration with a team, business analysts:

- leverage problem solving skills to address clients' overarching business issues;
- develop custom analytic tools, integrate multiple sources of qualitative and quantitative data and perform analysis to evaluate strategic alternatives;
- synthesise analytic results and design structured communications;
- collaborate with ZS teams and clients to provide action-oriented recommendations and implement innovative solutions."

This final Chapter considers processes the analyst can use to develop options that are based on the analysis of data discussed in the previous chapter. There is an expectation from the "client" that it remains the role of the analyst not only to develop options, but also to evaluate them robustly and propose justified solutions on which to base decisions. Although, ultimately, it remains a managerial responsibility to make the final selection for the way forward, much relies on the way in which proposals are presented and the quality of the evidence and argument to support recommendations.

Learning outcome

On completing this chapter, you will be able to:

4 Apply analytic techniques to develop options for decision-making, reports and recommendations.

Assessment criteria

4 Apply analytic techniques to develop options for decision-making, reports and recommendations.

4.1 Apply analytic techniques to develop appropriate options in context.

4.2 Apply scenario planning techniques to support decision-making.

4.3 Apply mapping and testing techniques to justify recommendations.

4.4 Report coherent findings and credible recommendations to facilitate management decision-making.

4.1 Apply analytic techniques to develop appropriate options in context

Cause and effect

Chapter 3 ended with developing an understanding of the data, which was collected and analysed. Whilst interpretative findings (the "effect") are based on analysis, the outcome does not always consider the source/s or cause/s of the highlighted issues. Clearly for the purposes of developing solutions to issues, the root causes need to be understood.

For operational management, one approach is to use an Ishikawa (or "fishbone") diagram – a visual representation that starts with the "effect" or symptom of a particular problem, then breaks it down into the potential root or causes. This diagram is a type of mind-mapping and can be employed successfully as an activity in which individual teams take responsibility for analysing a particular category (e.g. a functional area, such as marketing), and then determine what aspect may be a contributory cause of the "effect". Once the cause is established, the route to a solution is answering the "why?"

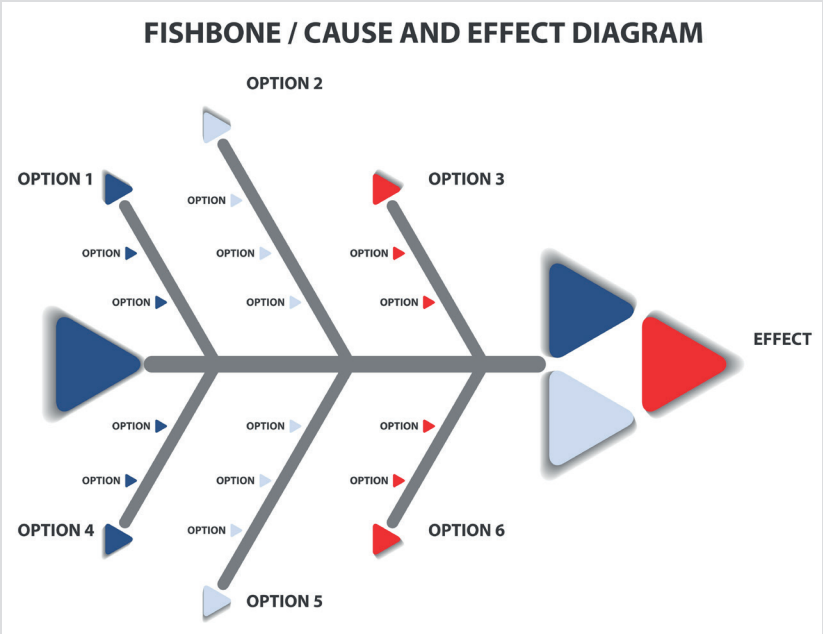


Figure 1: Ishikawa (Fishbone) diagram

The "effect" is the outcome; usually a failure highlighted as an issue for consideration. Arguably the same process could be used for a positive outcome for benchmarking purposes. The labelling of categories must be relevant to the circumstances and the areas or issues that are under discussion. The following are some suggested category headings:

Industry type/ process	Service sector (4 "P"s)	Manufacturing (6 "M"s)	Process steps (examples)
Category headings	Policies	Machines	Determine customers
	Procedures	Methods	Advertise product
	People	Materials	Incentivise purchase
	Plant/technology	Measurements	Sell product
		Environment (mother nature)	Distribution
		Manpower	Provide upgrade

Source: www.isixsigma.com/tools-templates/cause-effect/cause-and-effect-aka-fishbone-diagram/

Table 1: Fishbone diagram – possible categories (example)

OVER TO YOU

Activity 1: The Ishikawa (Fishbone) diagram

Consider the causes of obesity and how companies like Nestlé may have contributed to it. Prepare a fishbone diagram to understand causes and why these are causes. (You may find it interesting to see what Nestlé is doing about this by visiting http://www.nestle.com/ask-nestle/health-nutrition/answers/what-is-nestle-doing-about-obesity.)

Predictive techniques

Previously, we discussed the role of mathematics and statistics to facilitate predictions for future events, based largely on trends through extrapolation and regression analysis. We also discovered that sophisticated applications using cutting-edge technology and artificial intelligence (AI) have been developed to support this process. Given the vast amounts of accessible data providing valuable insights into performance, it is anticipated there is a far greater likelihood of achieving accurate predictions on which to base business decisions and thus potential successful outcomes.

OVER TO YOU

Activity 2: Future Nestlé

Based on data analysis of Nestlé for the past three years, undertake a predictive extrapolation using the spreadsheet functions.

1. **In the unlikely event that all factors (including unpredictable markets) remain equal (linear), what would be the likely outcome?**
2. **Assuming not all factors remain the same, the correlation between different factors will change the likely outcome. From your analysis of models in Chapter 3 (e.g. STEEPLE, Five Forces model), what factors will have an impact on your predictive extrapolation (non-linear)? Do you perceive actual outcomes are likely to be better or worse than the statistical predictions? Why?**

4.2 Scenario planning techniques to support decision-making

Business modelling

Towards the end of Chapter 3, we used a few well-known models (e.g. SWOT) to facilitate analysis and interpretation. There are many more depending on the purpose and nature of the project. Many business positioning models have a dual purpose – to assess the current and then predict the

future. They often have the visual advantage of plotting the current situation and then re-worked with a given set of circumstances, suggesting direction of travel as a forecast for the future. So starting with a premise of evaluation of potential based from current positioning, interpretation of the "now" is used to form options for strategy development.

In this next section, we will be highlighting a number of other modelling tools, some re-worked to identify potential options.

Porter's generic strategies

A well-known model that you may have come across in earlier studies is the Generic Strategy model of competitive advantage. This matrix is based on the principle that the source of competitive advantage (the ability to outdo the competition) for an organisation is either through a business model based on low operating costs that yield higher profits than competitors, or an approach based on added value, differentiation or uniqueness, where profits will be gained because of exceptional quality or service. The third factor for consideration will also be the breadth of operation – so a small niche organisation may focus on just one aspect of the market, either through restricting costs with limited operations or providing, for example, bespoke services that attract a small but valuable clientele. Porter advised that a strategic business unit should opt for a single approach at any one time (although this may change over time depending on organisational development).

For the business analyst, the relevance of an organisation's position in the matrix will have an impact on any advice given when selecting a strategy for future development, regardless of the nature of the proposals being suggested. For example, an SBU grounded in cost focus (low cost base) cannot easily build a brand reputation based on focused differentiation – this would require a much longer-term approach.

Porter's generic strategies

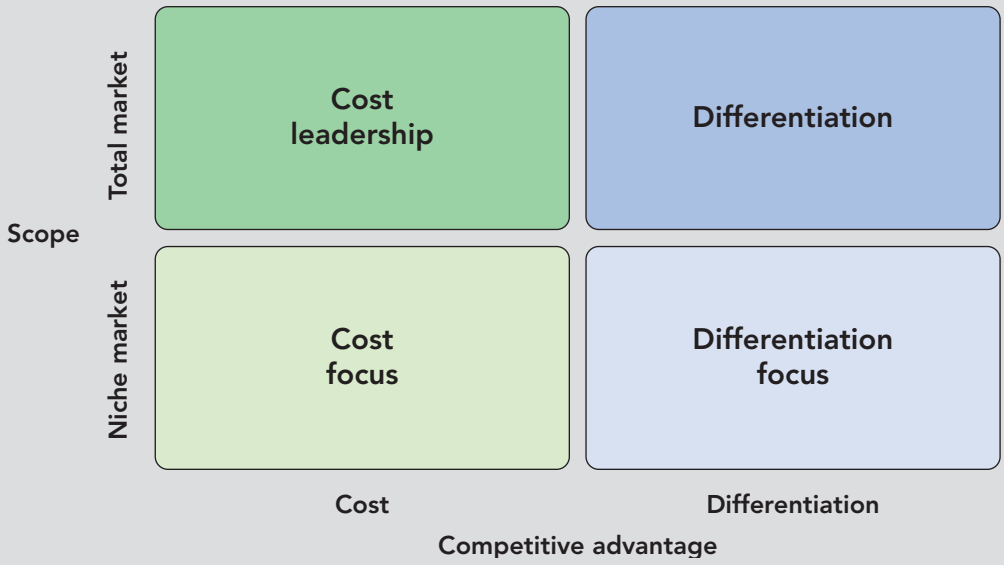


Figure 2: Porter's generic strategy analysis

Analysing the gap

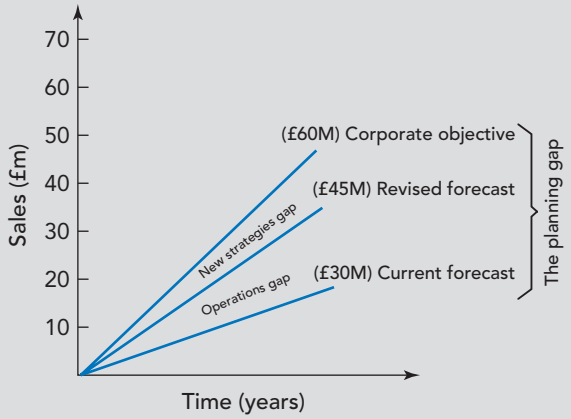


Figure 3: Gap analysis (example)

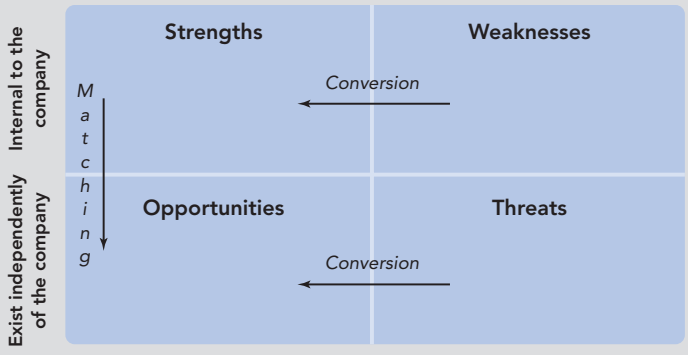
Gap analysis

"A process used in business to identify the requirements that will enable a company to close the gap between its current level of performance utilizing existing resource allocations and its potential performance based on the optimum allocation and integration of resources. Gap analysis provides the basis for determining whether desired outcomes are realistic based on time, money and human resources available to achieve them." http://www.investorwords.com

The gap analysis helps to visualise the "space" between current forecasts (if there is no change in circumstances) and pre-determined corporate objectives, suggesting whether the gap can be 'bridged' using operational refinements or requires a more strategic approach to planning.

Transforming SWOT to TOWS

One of the main uses of the SWOT analysis is to determine strategies to "convert" weaknesses to strengths and threats to opportunities, then matching the two. To achieve this, the analyst can develop a "TOWS" matrix, based on linking the external evaluations (opportunities and threats) with the internal evaluations (strengths and weaknesses) to better understand the type of strategies that need to be considered. Based on the figure below, key areas are those deemed to be of major importance:



	Strengths 1 2 3	Weaknesses 1 2 3
Opportunities 1 2 3	S - O KEY AREA Offensive Strategy	O - W Defensive Strategy *(Needs investment)*
Threats 1 2 3	S - T Defensive Strategy *(Requires care)*	T - W KEY AREA Possible Exit

Figure 4/5: SWOT to TOWS

The next stage is to determine a potential range of strategies for each S-O, O-W, S-T and T-W mix.

OVER TO YOU

Activity 3: TOWS matrix

Scenario

A company has identified a major marketing opportunity to expand into India. As the market leader, it has an excellent brand reputation but currently has no presence in India, finding it difficult to access this potential.

Using TOWS, suggest what the company could do to exploit its strength and overcome the weakness identified.

Modelling product and market forecasts

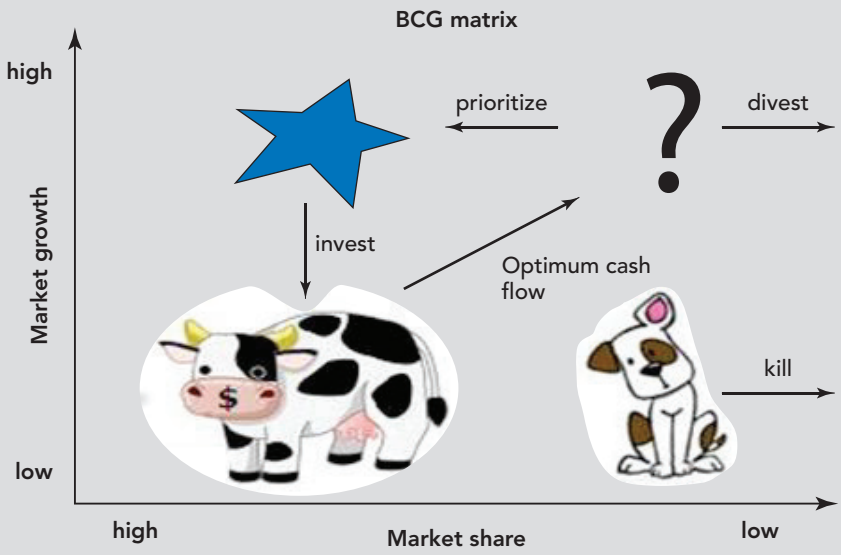


Figure 6: BCG Matrix, adapted from Maxipedia

BCG matrix

The Boston Consulting Group Matrix (BCG) plots current position of a firm's products relative to market growth and share, and then uses prediction to support decisions which will optimise the product portfolio.

This is a well-known tool for evaluating a company's product portfolio. In planning, the BCG anticipates products will move over time from the early introduction phase, before transitioning to "star" value and, in the mature phase, becoming a cash cow, prior to decline (dog). The value to decision-making comes from the accuracy of this forecasted movement to create a supported and balanced portfolio. For example, development in the early stages of a product launch is expensive and will reap few returns with an uncertain future. A company will benefit greatly from having sufficient reserves generated from a substantial cash cow to support future product development.

Another model worthy of consideration is the **GE (General Electric) Matrix**, which considers not just products but also the market and industry in which an organisation operates.

GE McKinsey Multifactor Matrix

GE-McKinsey is a framework that evaluates business portfolio, provides further strategic implications and helps to prioritize the investment needed for each business unit (BU).

David, F.R. (2009). Strategic Management: Concepts and Cases. 12th ed. FT Prentice Hall

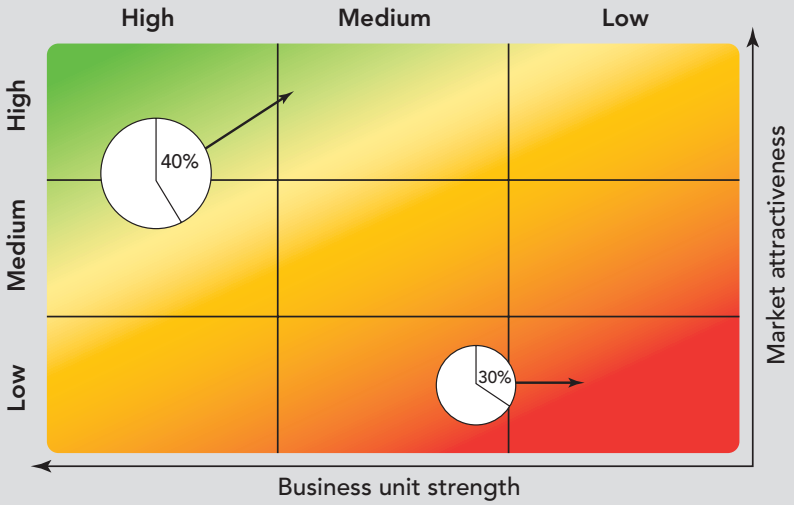


Figure 7: GE McKinsey Multifactor Matrix

In this model, products (or business units) are evaluated based on market share/market size and then rated and weighted by both business unit strength and market attractiveness. Whilst business strength is easy to identify in terms of market share and overall size of the market, market attractiveness is concerned with the market's overall ability to provide growth and profit for the players, when compared to alternatives as a benchmark. High attractiveness indicates current and potential long-term growth in an expanding and profitable market.

Predictions are then made on the product and market's future direction. The shading in the diagram above is based on a "traffic light" system, which indicates the approach a business might take to achieve its strategy. For example, in the diagram above, the product plotted in the green zone merits investment, as the company is likely to be the market leader at present (40%) – but whilst the future market is looking very good, the market leader is anticipated to move from high strength to being rather less successful. Using "cause and effect" diagrams (above) may help determine why.

OVER TO YOU

Activity 4: GE McKinsey Multifactor Matrix

Scenario – based on example in Figure 7

1 Suggest reasons why it has been predicted that the product in the green zone will be less successful than it is currently.

2 Interpret what may be happening to the product in the red zone. Why could this be happening?

4.3 Application of scenario planning techniques to support decision-making

Scenario planning techniques

> *"Scenario planning does not attempt to predict the unpredictable; the point is to consider alternative futures."*
>
> *Johnson, Scholes and Whittington (2009)*

Alternative futures

The use of scenarios in business planning is based on a single question: "What if…?" For the operations manager, the "What if…?" may refer to a mundane event, such as machine breakdown (in production) or poor weather (in the construction industry or for an event). At strategic level, where there is little certainty, scenarios are most usually developed from drivers for change; often identified by a STEEPLE analysis.

Alternative futures at Nestlé. What if…?

What if…?	Alternative futures	
Social/Demographic	Birth rates rise	Birth rates fall
Technology	Breakthrough science means sugar free products tastes just as good	Breakthrough sciences on sugar free products means quality is good but different
Economic	Growth rates in developing countries rise	Growth rates in post-industrial nations stagnate

What if…?	Alternative futures	
Environmental	US President gets go ahead to overturn Paris Agreement (2015) on emissions reduction	US president fails in attempt to overturn Paris Agreement (2015) on emissions reduction
Political	Due to agreement on Ukraine, EU restrictions on trade with Russia are lifted	Lack of progress on implementation of agreements cause EU to deepen restrictions on all food products to Russia
Legal	World Health Assembly (WHA) Codes on baby milk are enforced through EU directives	Natural baby (mother's) milk is still promoted by authorities as being the best formula
Ethical	Toddler obesity in low income families in US is dropping slightly	Toddler obesity in high income families in China and Indian sub-continent is rising

Table 2: Example: What if…?

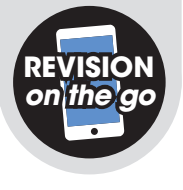
Alternative market responses

The same principles apply when using the "What if…?" question to determining market place futures. In this case, application of Porter's Five Forces model (high or low threats and bargaining power) can help determine competitive environmental responses in a given situation. The key to using not only the Five Forces model but most of the others (e.g. STEEPLE) in these scenarios, will be to remember that an external or competitive factor will affect all competitors in the market; inevitably leading to a response from them to meet and combat the challenges faced.

Alternative responses – Five Forces model

Example: What would competitors in a sector do if…

1. Suppliers only have limited resources and raw materials are scarce?
2. One major competitor raises their prices well above inflation?
3. Customers are looking for change in their spending and more are spending money on substitute products?
4. A major player in the global market acquires one of the key competitors in the sector?



Internal questions

The "What if…?" question can be used also to consider internal futures, but in this case it often relates to reactions from the internal stakeholders to given situations.

Example scenario: a department is under threat of several redundancies. What may happen if generous voluntary redundancy terms are offered? Alternatively, what may happen if compulsory redundancy terms are the only ones available?

Scenario decision-making processes

> *"Scenario planning is a creative process much like writing a novel with a plot beginning with current reality… It is generally used to assess the risk associated with a key decision being considered."*

http://www.threesigma.com/scenario_process.htm

The processes

Schwartz (1991) suggests that the starting point to resolving the highlighted issues (both internal and external) is to start from the decision-making perspective. There are seven steps to the process of building alternative decision-making scenarios:

Step one: identify the focal issue or decision facing the enterprise.

Step two: list the key factors (critical success factors) that will influence this decision.

Step three: list the driving forces (usually macro-factors) that influence these key factors.

Step four: rank the lists for steps two and three by importance and uncertainty.

Step five: develop scenario plots for alternative futures that could impact on the decision.

Step six: evaluate the decision in each scenario.

Step seven: select indicators and signposts recognising the future is not fixed and enabling identification of sensitivities of change in the marketplace.

Scenario planning methodologies

Whilst autocratic or entrepreneurial decision-making may be appropriate in some instances and cultures, many organisations recognise that different viewpoints and collective wisdom in complex situations may lead to a more acceptable outcome if key stakeholders or experts are involved in the decision-making. In effect, decisions are made by a logical process of **consensus** that is gained from affirmation and commitment. Even those who are in disagreement respect the process under which the decisions have been made.

1 Consensus (**Delphi**)

Whilst mind-mapping and brainstorming are useful tools for the development of ideas and different options, these develop from a fairly random means of capturing ideas. The Delphi Method, however, is an entirely structured process.

Based on an ancient Greek process, the Delphi Method involves managing the viewpoints of a group of individuals (average size of group being 20) that are selected for their expert opinion and/or their knowledge of the different angles of the issues. Sent or given the issues and key contributory factors, the participants, working individually, are requested to develop detailed suggestions for alternative actions that are supported by a justification. Once received, these ideas are synthesised and anonymously sent out to all the participants again for review and refinement. The process then continues until some form of consensus has been achieved and agreed with all parties. One benefit is that each stage of the idea development process is articulated after careful and objective reflection and justification, and not subject to the types of pressures created by group interactions. Anonymity is considered an important factor in this.

2 Balanced Scorecard

> *The balanced scorecard is a strategic planning and management system that is used extensively in business and industry, government, and non-profit organisations worldwide to align business activities to the vision and strategy of the organisation, improve internal and external communications, and monitor organisational performance against strategic goals.*

Balanced Scorecard Institute

The Balanced Scorecard (BSC) was developed by Kaplan and Norton in the early 1990s as a management performance tool. The starting point for its use in developing options and decisions depends on whether the organisation develops decision-making through a top-down approach or bottom-up (see Chapter 1). The top-down approach starts from vision and strategy, then different perspectives of the business look at how their activities can link to these perspectives. Bottom-up drives inside-out and suggests ideas based on the functional areas out of which the vision and strategy are developed. Nonetheless, each business aspect must answer the following questions:

Financial perspective: to succeed financially, how shall we appear to our shareholders?

Customer perspective: to achieve our vision, how should we appear to our customers?

Internal processes perspective: to satisfy our shareholders and customers, what internal business processes must we excel at?

Learning and growth perspective: to achieve our vision, how will we sustain our ability to change and improve?

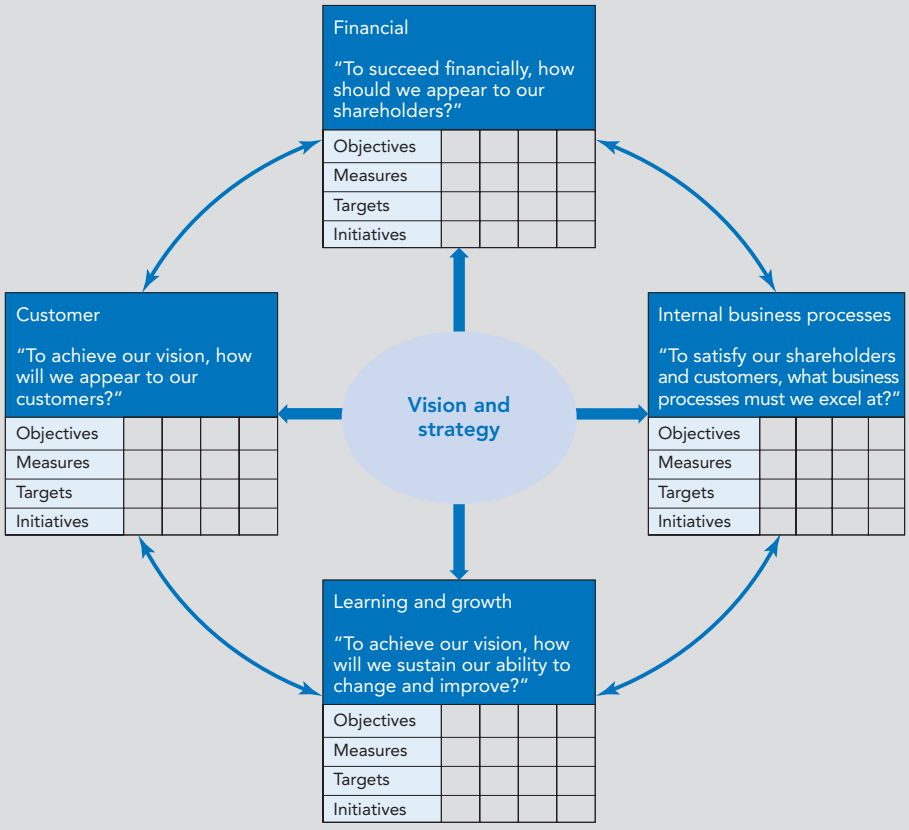


Figure 8: The Balanced Scorecard

Those developing answers to the questions posed in the four perspectives will build options that outline objectives, measures, targets and initiatives for each.

The key to building a successful BSC lies in the sharing of ideas, understanding what is important for each perspective and the integration and affirmation of sometimes contradictory viewpoints. This way, options can be refined and a realistic agreed plan of action is developed.

The Value Chain also is a useful tool for evaluating options for the organisation and can be used successfully if one aspect of the business has a focused strategy, to which the rest of the organisation must contribute to support the development and assure its success.

3 The **Pareto effect**

Developed in the early 20th Century, the Pareto Principle (80/20 rule) is a useful tool to help the prioritisation of tasks. Although its foundations lay in a mathematical formula, Pareto is uncommonly accurate, even when loosely applied to any given situation.

In the business context, this simply means that, for example:

- 80% of revenues are generated by 20% of customers
- 80% of complaints come from the top 10% and bottom 10% of customers
- 80% of quality issues occur with 20% of problems.

The impact, when applied, is that it helps the analyst to develop options that prioritise those areas of activities that focus on maximising outcomes.

OVER TO YOU

Activity 5: Developing options

Use at least two modelling and scenario planning techniques to develop some options for Nestlé that support and promote their vision.

Hint: You might like to consider the headline – "What is Nestlé doing about tackling obesity?" as a basis for your option development.

4.3 Application of mapping and testing techniques to justify recommendations

Selection and recommendation

No recommendation for a course of action can be established without justification. This section suggests different methods that can be used to evaluate options to support selection.

A simple approach to decision-making in organisations often develops organically through situation/circumstantial and emergent strategies. Many of the judgements made will be dependent on examining different methods to be employed to achieve the aims – these affect the overall costs and benefits associated with the decision. Once success criteria have been established (see BSC perspectives above) options can be evaluated for selection.

Suitability – concerns whether the individual option choices address the key issues identified in analysis.

Acceptability – relates to the needs and expectations of stakeholders. This may concern shareholders, employees and customers, but likely reactions from competitors and suppliers will be considered as well as potential risks – whether they are acceptable or not to the stakeholders.

Feasibility – focuses on whether the proposals are viable and realistic. Whilst its feasibility may concern financial viability, it will also consider the wider non-financial resource issues of staff, production capability and accessibility of markets.

Finally, determinants for selection will depend on the organisation's financial position, structure and culture at the point of decision and whether the decision-making process is planned, enforced or by order (of, say, a corporate parent). In developing markets or organisations, decisions may be made to support the organisation in its future learning and development (Johnson, Scholes and Whittington, 2008).

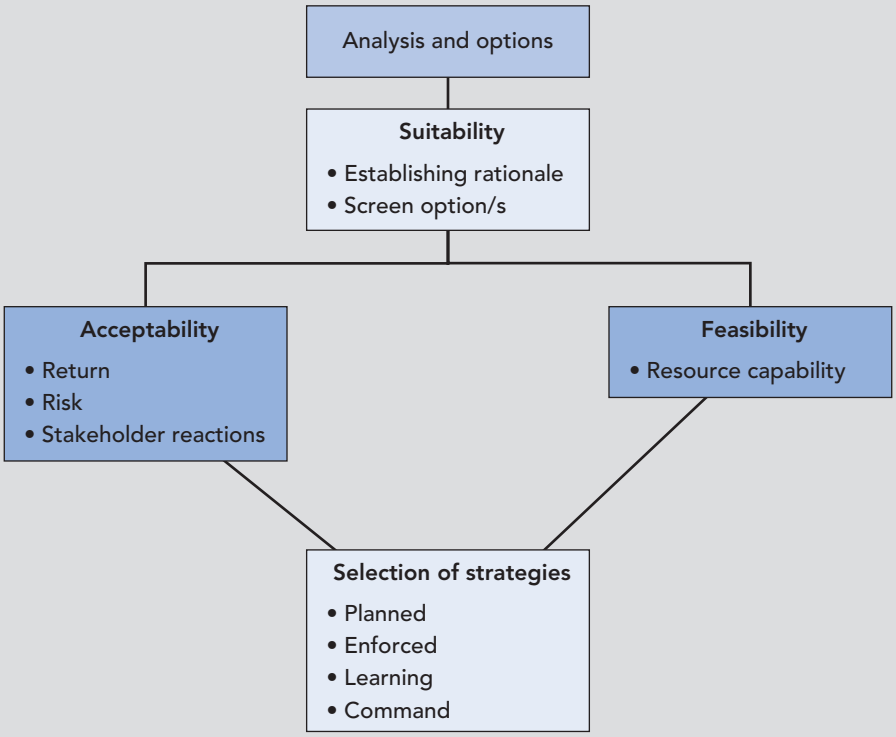


Figure 9: Strategy selection

Scoring mechanisms

Many of the predictive techniques examined through specialist software modelling are invaluable. They use weighting and rating techniques to develop mathematically-based scoring methods in order to facilitate solutions and recommendations.

In the outlined example below, scoring techniques have been used to identify which actions may have the best likelihood of success.

Options	Suitability	Acceptability	Feasibility	Total
1 Do nothing	2	0	2	4
2 Consolidate segments	2	1	3	6
3 Expand overseas	1	1	1	3
4 Launch new "up-market" brand	3	3	3	3
5 Open retail outlets	3	3	1	7
6 Diversify	0	2	1	3

Table 3: Example strategies – suitability, acceptability and feasibility scoring

Table 3 is based on a simple evaluation (justified through research with key stakeholders) and rated using a scoring of 0–5. In this example, each element of the suitability, acceptability and feasibility criteria has been appraised with equal value (not necessarily the case). Therefore, the highest score, "Launching a new up-market brand," would appear to be the most advantageous and may prove a justification for recommending this particular strategy.

An alternative scoring process may be evaluation based on importance (weighting) and then using a scoring formula. In the example below, appraisal of potential has been adapted from the **ServQual** equation for valuing existing performance, measuring the gap between performance and expectations, and proposals to improve service quality performance:

Current service quality = importance x (performance–expectations)

The example below evaluates two potential options for an Italian restaurant. In this case, the equation has been amended to consider acceptable expectations based company performance.

Option (example)	Dimension	Current performance (P)	Importance (I)	Expectations (E)	ServQual Score I*(E – P)
1 Increase menu range to include other Italian foods	Reliability	4	5	5	5
	Assurance	4	5	5	5
	Tangibles	3	3	3	0
	Empathy	2	3	4	6
	Responsiveness	1	5	4	15
Totals		**14**	**21**	**21**	**31**

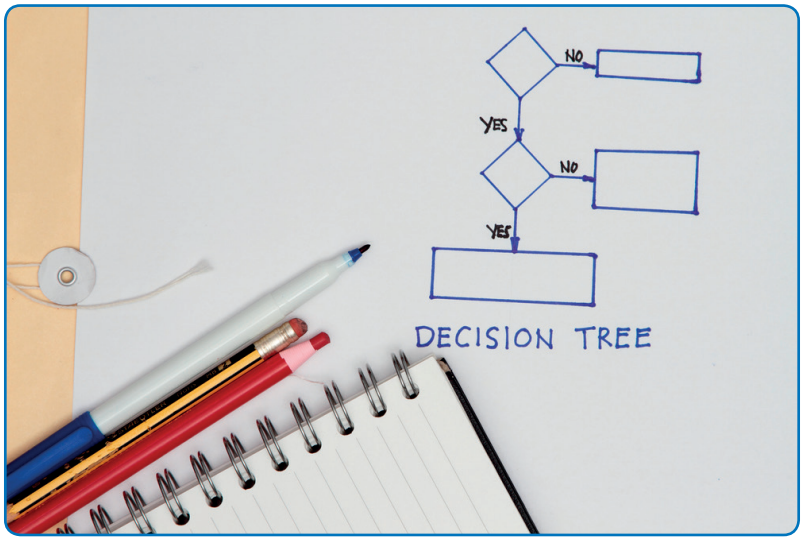
Option (example)	Dimension	Current performance (P)	Importance (I)	Expectations (E)	ServQual Score I*(E – P)
2 Diversify menu to include other European menus from France, Greece and Turkey	Reliability	2	3	5	9
	Assurance	1	4	5	16
	Tangibles	3	4	3	0
	Empathy	1	5	4	15
	Responsiveness	0	5	3	15
Totals		**7**	**21**	**20**	**55**

Table 4: Example SERVQUAL© strategies for an Italian restaurant

Whilst current performance lies below expectations, the system also measures the quality gap between expectation and performance for both proposals. Clearly option two shows a much larger gap than option one, but given that it is currently an Italian restaurant, that is not surprising. It may be more important for the company to opt for a third option, i.e. to develop strategies to optimise current performance to meet customer expectations, rather than an expansion strategy.

Decision trees

Decision trees build successive criteria that are used to evaluate options, which are then eliminated as additional criteria is introduced. To become more effective and to justify judgements, a quantitative method approach to using the model is preferable. This means using estimates and probabilities to calculate likely outcomes. For business, financial calculations on capital investments may be used to facilitate judgements made. In other examples, margins of tolerance (best and worst case) estimates will be used. In any case, the decision tree helps to decide between options and to determine whether a course of action is likely to give benefit.



The link below demonstrates the use of a decision tree at Yamaha.

https://www.slideshare.net/alitsiia/decision-tree-case-study

Return on investment (ROI)

No business decision can be made without a realistic assessment of the financial returns and implications of investment. **ROI** is usually judged by profitability, cost-benefit and shareholder value.

Financial criteria

Three commonly used methods to calculate ROI are:

Return on capital employed (ROCE) – this measures the earning power of resources used in the implementation of a particular option.

Payback period – length of time before cumulative cash flow generated from investment in an option becomes positive.

Discounted cash flow (DCF) – an investment appraisal tool: this assumes that money invested has greater value now than at the end of the payback period. Calculations are made to "discount" the value based on factors, such as inflation, and the extra cash flow generated from the investment on a year-by-year basis to the anticipated end of the project.

Cost-benefit

In many cases, simply calculating financial returns may be insufficient and provide too narrow a focus. There may be many other benefits to undertaking a particular course of action, or it may also be that returns are just impossible to calculate. For example, the direct returns on a brand enhancement campaign may be difficult to measure. For public infrastructure projects, monetary valuations are difficult, but cost-benefit analysis ensures that management considers other contributory factors when making choices.

CASE STUDY

Cost-benefit – third runway at London Heathrow

London Heathrow contradictory viewpoints	
	
Government's own study reveals Heathrow third runway would be less beneficial to UK residents than Gatwick	**Third Heathrow runway would "boost each British family by £24,500"**

A bombshell government study found Heathrow's third runway would not benefit British residents as much as a second runway at Gatwick, the Evening Standard can reveal.

The cost-benefit analysis concluded that when benefits to overseas travellers and firms were excluded, British people and firms could gain up to £4 billion more in advantages if rival Gatwick was chosen for expansion.

In his Commons statement last week, Mr Grayling said Heathrow's north-west third runway plan was chosen because it offered "the largest benefits to passengers and the wider economy, of up to £61 billion over 60 years".

However, the Further Review and Sensitivities Report makes clear that these benefits include impacts outside the UK as well as the value to overseas travellers using Heathrow as a hub to pass through.

When the UK-only benefits were calculated, they estimated that a third runway would bring benefits of between £5.8 billion and £9.9 billion. But they predicted Gatwick expansion would be worth £8.9 billion to £10.3 billion to U.K. residents.

3 November 2016

Extracted from:

http://www.standard.co.uk/news/transport/government-study-heathrow-s-third-runway-less-beneficial-than-gatwick-a3386176.html

A third Heathrow runway may lift the UK's gross domestic product by as much as £24,480 per family over a 60-year period, according to a report by the Centre for Economic and Business Research (Cebr) that was commissioned by Heathrow.That compares with a lift of just £13,280 that would result from building a second runway at Gatwick, Cebr estimated.

A third runway at Heathrow will cost an estimated £17.6bn

Expanding Heathrow rather man Gatwick would also deliver a bigger economic boost to the UK regions, the consultancy firm said. A third Heathrow runway would provide £56bn more in "GDP benefits" to the regions beyond London and the south east than Gatwick.

However, political divisions threaten to derail Heathrow's plans, which are strongly opposed by some local residents because of worries about increased noise and air pollution.

2 September 2016

Extracted from:

www.telegraph.co.uk/business/2016/09/02/third-heathrow-runway-would-boost-each-brrtish-family-by-24500/

This attribution of monetary value may include multiplier or linkage benefits (i.e. increased trade, visitors and associated income benefits to the local economy – e.g. additional employment) as well as amenity benefits. However, as we can see from the example above, assessing those benefits can be difficult and contradictory, generating opposing viewpoints that include negative elements, such as higher pollution and noise. This leads to additional costs, increased health risk and the need for greater noise insulation.

Shareholder value

This aspect refers to the likely benefit shareholders will gain from the outcome of the decision-making process from dividends paid made on the basis of profit. However, in the event of a large scale long-term investment, it is likely dividend payments will be halted or reduced pending on returns. The shareholder will be concerned about the long-term impact on income from investment

and also of course on changes to share values for the company – that will be dependent (at least in part) on the impact of investment.

OVER TO YOU

Activity 6: Selecting options – Nestlé in society

In the previous activity, you developed options for Nestlé. Use these for the following task:

1. **Evaluate each one for suitability, acceptability and feasibility – building a scoring mechanism.**
2. **Use a decision tree, indicate probabilities of success and likely return (investment appraisal considerations may help).**
3. **Identify other intangible benefits of the options (cost-benefit).**
4. **Recommend a strategy.**

Risk mitigation

> *Risk is defined as unknowns that have measurable probabilities, while uncertainty involves unknowns with no measurable probability of outcome.*
>
> *https://www.reference.com*

No studyguide on business decision-making is complete without reference to risk evaluation and mitigation. Throughout this section, consideration has been given for the estimated value of a business taking a particular course of action. As has been seen, not all value can be based on financial returns, but also on the intangible, difficult to measure benefits and long-term impacts

on the business. No analyst can predict the unpredictable, but evaluation and recommendation of options should be assessed for risk – risks in the event of failure to meet targets, but also in the event of overachievement, which will be alternative problems.

Break even analysis, organisational gearing (indebtedness) and other ratios can all be used to pinpoint minimum acceptable levels of return.

Tolerances, such as the identification of the minimum acceptable best and worst case scenarios, margin of error or sensitivity analyses, are used in decision-making (see decision trees).

It is the role of the business analyst when evaluating options and recommending courses of action to highlight the possible risks involved and any contradictions that may be evident.

It is helpful to remember that some of the models we have used to develop our analysis and options are also useful to identify potential for risk. For example, we noted in the BCG (Figure 6) that a product position on the grid will inform the likelihood of financial business risk – the "question marks" (often products in the early stages of development) will pose the greatest risk. Equally, strategies suggested by the GE Matrix through the "red, amber, green" (RAG) rating give a visible interpretation of risks involved in adopting a particular generic course of action.

Risks are assessed based on their likelihood of occurring and the impact on the organisation should they do so. Figure 10 indicates impact/probability areas which are acceptable and which are not.

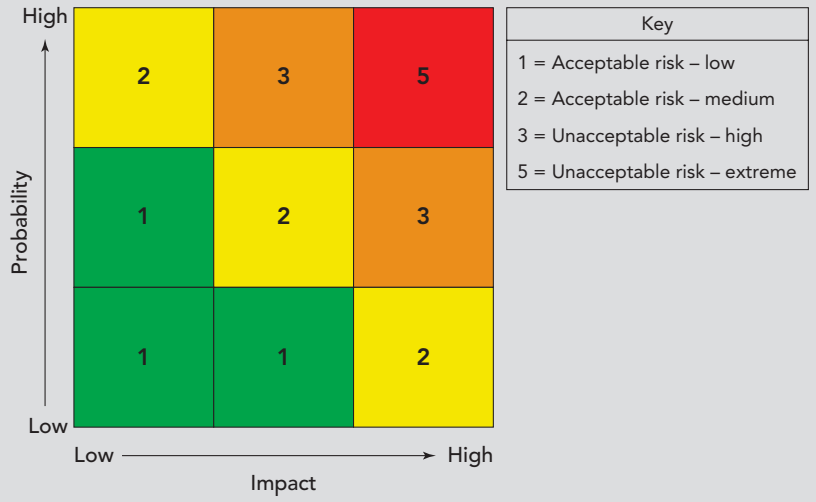


Figure 10: Impact and probability matrix

Handling risk acceptability in practice differs significantly. Based on Figure 10, risks regarded as having low impact but are very likely to occur should be dealt with on an operational (or day-to-day) basis and planned into daily routines (e.g. illness or holiday cover), whereas those unlikely to occur, but having a huge impact – also a medium risk – will require contingency plans to be in place. In decision-making, the level of risk should be considered and strategies suggested based on the impact and likelihood matrix.

There are five distinct responses to a risk:

- Acceptance – do nothing and accept the risk without any further action of provision.
- Prevention – in some risk cases, options are available to prevent/avoid the risk from ever occurring at all.

- Reduction – this might apply to both the likelihood of the risk occurring and the potential impact of the risk.
- Transference – this involves the contractual transfer of a defined risk to another party, either to an insurance company or a contractor.
- Contingency planning – where prevention, reduction or transference are not available on a cost-effective basis, contingency planning is likely to be a superior option to mere acceptance.

Agreeing a way to deal with a risk is essential even if the response is a straightforward acceptance of the risk.

Finally, any identified implications of decisions that are made should be clearly articulated within the content.

OVER TO YOU

Activity 7: Risk management – Nestlé in society

Review your recommendations for Nestlé

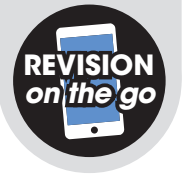
1 Referring to Figure 10, how would you evaluate the risk profile of your recommendation?

2 What strategies could you adopt to deal with the risks (see the list of responses to risk)?

What is business contingency planning?

"A contingency is an unexpected event or situation that affects the financial health, professional image, or market share of a company. It is usually a negative event, but can also be an unexpected windfall such as a huge order. Anything that unexpectedly disrupts a company's expected operation can harm the company even if the disruption is because of a windfall. That is why companies create contingency plans for many possible situations, so company management has a pre-researched plan of action to immediately follow. Some threats usually covered in contingency plans are crisis management, business continuity, asset security, mismanagement and reorganisation."

http://smallbusiness.chron.com/business-contingency-plan-1081.html



Reporting for management decision-making

Reporting the outcomes of research with associated recommendations is the final piece in a complex jigsaw – the presentation of which, some would argue, will be pivotal in the decision-making process. Whilst the author may not be responsible for the actual decision or its implementation, the presentation of the report findings will be hugely influential in the final decision. If the report is perceived as professional and credible, its likelihood of successful acceptance is so much greater and the reputation of the author will also be enhanced.

In most cases, it would be anticipated that a presentation of findings will be in a business report with an oral presentation, supported by slides (PowerPoint) or similar. In this final section, guidance is given for each of these in turn:

- issue selling
- profile of target audience and readership
- structure and presentation of report and associated presentations
- written communications and visual tools (**graphs** etc.).

Issue selling

> *"The process by which individuals within an organisation bring ideas or concerns, solutions and opportunities together in ways that focus others' attention and invite action."*

www.sloanreview.mit.edu/article/strategy-issue-selling-in-the-organisation

The process of an analytical approach to business decision-making is complex, time-consuming and ambiguous. It is therefore important for the author (or indeed the team involved in the research, analysis, interpretation and development/selection of options) to be given the optimum chance to gain approval for the recommendations put forward. This is known as "**issue selling**".

There is a responsibility, therefore, to ensure plans are in place to seek the attention and support of influence management and other influential stakeholders. Johnson, Scholes and Whittington (2008) suggest four areas for consideration:

1 **Issue packaging** – in which links to organisational goals or performance metrics are clear and consistent with cultural norms. The issue should be presented succinctly with potential solutions and recommendations.

2 **Use formal and informal channels** of influence to raise the profile of the issue and to gain widespread support, putting effort into those who may have a critical influence on acceptance (high influence/high interest).

Mendelow's Power/Influence Grid

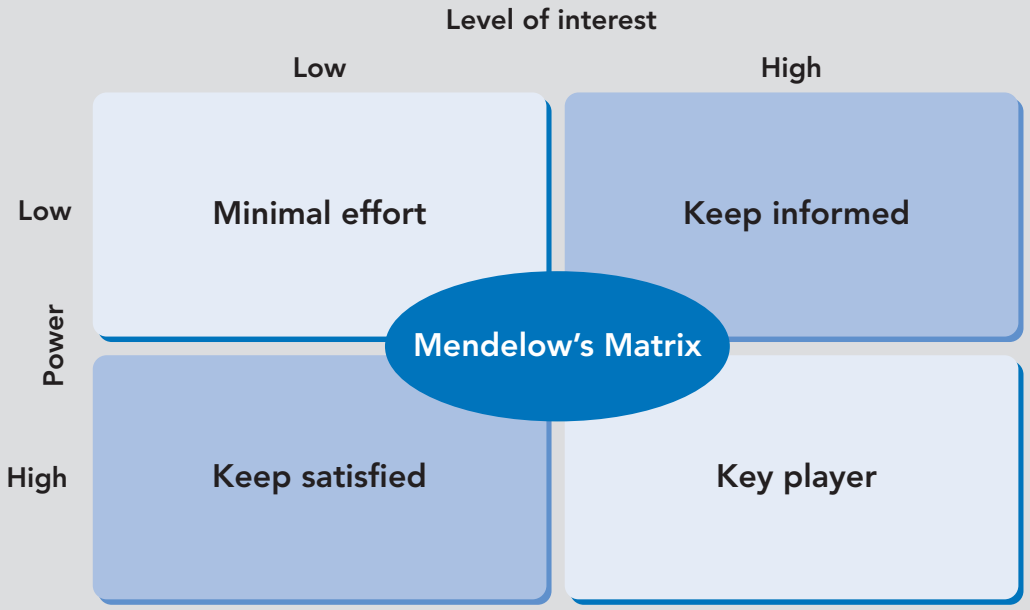


Figure 11: Power and Influence Matrix, adapted from https://www.sketchbubble.com/en/presentation-mendelow-matrix.html

3 **Decide whether to "sell" alone or in coalition** – whilst assembling a group of supporters to help put your case may add weight, credibility and influence to the argument, compromise may follow, as will blurring of issues.

4 **Timing** is everything. Choose the wrong moment to present your case and it will be impossible to persuade decision-makers of the wisdom of your proposals.

Profile of target audience and readership

Report structures, style and emphasis should reflect the target audience and the wider readership.

Generally, there are three levels of readership for a business report. The final decision on structure will be dependent on the nature and purpose of the report, and who commissioned it. It should also be aimed at "selling" to the most senior and/or influential decision-maker. Broadly, there are three categories of readership:

- **1st level readership** – often senior management (CEO/director level) – generally their interest will be limited unless their attention is captured (see point 1 above). In this instance, their reading of the report may be limited to the summary pages at the start of the document – although they could be "drawn" in if they perceive it is beneficial to do so.

- **2nd level readership** – usually general management or interested stakeholders, perhaps from other departments that may have an operational interest in the content and how it affects them. This group will read the body of the text and pay particular attention to graphs and charts to gain as much information as possible.
- **3rd level readership** – the decision-maker and immediate colleagues who will be reading this with in-depth understanding of the background to the report and will wish to see how this may impact on their role. These colleagues will read the work in detail – perhaps with scepticism – and are the most likely to criticise the outcomes.

Structure and style

Structure – this is a business report (not an academic research paper) and should follow an appropriate format that considers the organisation's protocols for report presentations.

- Reports should be structured to reflect the levels of readership. As a minimum, it should include:
    - executive summary – which captures the essence, findings and recommendations of the report (first level readership);
    - contents page;
    - terms of reference – purpose of the report;
    - summary analysis of findings with visual representations;
    - conclusions with risk evaluations and recommendations with;
    - appendices – detailed breakdown of findings and calculations, supporting text in the analysis of findings.
- Presentation slides (or equivalent) that capture key aspects of the report, with images (graphs etc.) that link directly to the report for reference.

Style – the style and overall presentation should be professional and logically structured with numeric headings, as well as accurately reflecting the brand of the organisation, using templates and colour for presentation where appropriate. It should clearly establish from the outset its purpose and acknowledge the initiator. Other tips to gain credibility are good use of space to make reading easy, interspersed with visual interest (provided they are relevant).

Emphasis – although the report should be objective and well supported with data, emphasis, as we have seen previously, may be slanted or focused on a particular aspect to interest the target audience. Therefore, the design and emphasis within it should reflect the real purpose of the report, and technical quality of supporting content (analysis, statistical tools and modelling) should be high and supported (where possible) with third party endorsement.

Communication

Effective communication is, at minimum, a two-way process. Shaping the right message to suit the target audience (their knowledge and experience) is essential.

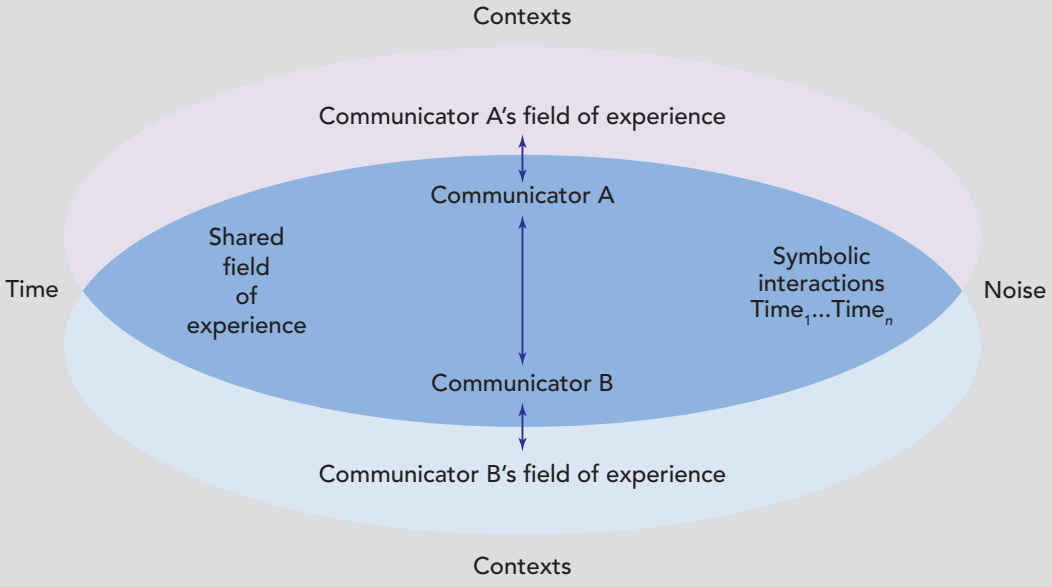


Figure 12: Communication – transactional model, adapted from www.sfc.keio.ac.jp

Four elements are particularly important:

- **focus** on the key components of the message;
- ensure communications are **impactful** with powerful messages and memorable images;
- choose appropriate **media** to convey the message;
- encourage colleague/employee **engagement** in the process and decision-making.

Other considerations include:

Language – appropriate use of business language (both vocabulary, style and punctuation) is essential. Sentences should be short and meaningful, written factually and logically with a minimal use of adjective/adverbs, emotive wording and no colloquialisms. Ensure proof-reading is undertaken, especially by a third party.

Visual tools – it is often said "a picture paints a thousand words" – as many people learn visually, so use of images will have a greater impact than writing. This will include a range of applied models, tables, charts and graphs (such as bar and pie charts, line and scatter graphs). Source data may be included in appendices for detail or held elsewhere.

Report presentations – it will be quite usual for submission of a report to be accompanied by an oral presentation to managers. Important points to consider for successful presentations are a well-planned and timed presentation, succinct and clear representation of the key points, ability to present and answer credibly and with authority and useful visually attractive slides for a professional image.

Alternative and supplementary media – in general communications, experts all agree that presentation of a message has most impact when it is reinforced repeatedly, using as many different media as possible. Selecting key headline messages or extracts through electronic mass media is effective, even when restricted to an organisation's intranet. Examples include: shared drives, emails, actual and internet-based notice-boards and video presentations.

OVER TO YOU

Activity 8: Presenting your ideas – a strategy for Nestlé

1 Capture your recommendations for Nestlé's development in a short presentation, using slides if possible.

2 Test your presentation with a critical friend or study partner. Ask for questions on content and get feedback.

3 Use this to refine and improve your presentation.

4 Now present this again with a small group of colleagues, taking questions and receiving feedback.

5 What else can you learn for next time?

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Summary

This chapter has pulled together all the threads of analysis and interpretation and used different quantitative and qualitative methods of develop options for decision-making. These have included statistical methods, such as regression and evaluative approaches under a broad heading of strategy selection, and the use of scenarios, modelling and scoring mechanisms to test the suitability, acceptability and feasibility. Considerations for financial and cost-benefit analysis have been included as have decision trees.

The final section of the chapter has addressed the presentation of these findings. Whilst presentation may not be considered such a relevant aspect of the analytical decision-making process, successful outcomes will only be achieved if the author is conversant with and able to present and communicate in a credible and professional manner, supported with well-written and visually interesting and accurate data.

Glossary

24/7 A colloquial term referring to the increasing trend of businesses, particularly those operating in a global economy, to be actively working and trading all day/night and every day (i.e. 24 hours a day, 7 days a week).

Analytics The study of historical data to research potential trends, analyse the effects of decisions or events or evaluate the performance of a given tool or scenario. The goal of analytics is to improve the business by gaining knowledge that can be used to make improvements or changes.

ASEAN Association of South East Asian Nations – a trading bloc comprising 10 countries all situated in South East Asia, e.g. Malaysia, Indonesia and Vietnam.

B2B and B2C Terms meaning Business-to-Business, referring to trading between businesses as opposed to selling Business-to-Consumer.

"Bottom-up" strategy Strategies developed, agreed and communicated by the "grass roots" of an organisation and filtered up through its hierarchy to the top. At this point, decisions are usually refined by agreement before becoming part of the organisational goals and strategies.

BI (Business Intelligence) This refers to technologies, applications and practices for the collection, integration, analysis and presentation of business information. The purpose is to support better business decision-making.

Brexit A term meaning Britain's exit from the European Union (EU). It was coined from the referendum in the United Kingdom in 2016, in which campaigners in support of Britain leaving the EU were named as "brexiteers" and those in favour of staying were "remainers".

Business environments These relate to both the market and the sector in which the organisation operates. The business environment will also consider external factors, e.g. PESTLE/STEEPLE.

Business infrastructure Business infrastructure = business design + business processes. Business infrastructure ensures the proper coordination of all human resources, processes and other operational tools necessary to ensure both manageable and profitable growth.

Capability (business) The articulation of the capacity, materials and expertise an organisation needs in order to perform core functions. Businesses have threshold capabilities, based on a bare minimum to operate, or a competitive advantage, which gives them superiority.

Caveat A cautious warning that highlights a limitation.

Centralisation An organisation in which all decision-making and influence is focused in the core of the enterprise. This will usually mean at the top of the business hierarchy.

Chart (bar/column, pie) A set of coordinates which can be created with the use of graph paper, or more usually through software such as Microsoft Excel, to provide a visual image of a set of data.

CIPD Chartered Institute of Personnel and Development.

Codes of practice Guidelines issued by an official body or professional association in the form of written rules, which explain how organisations and people should behave.

Conglomerate A corporation that is made up of a number of different, seemingly unrelated businesses. In a conglomerate, one company owns a controlling stake in a number of smaller companies that conduct business separately.

Consensus decision-making A creative and dynamic way of reaching an agreement between all members of a group. Commitment to finding solutions that everyone actively supports or can live with.

Corporate A large organisation, comprising a group/s of enterprises formed into a legal entity.

Corporate governance A system of rules, practices and processes by which a company is directed and controlled.

Corporate and Social Responsibility (CSR) A company's sense of responsibility towards the community and environment (both ecological and social) in which it operates. Companies express this citizenship (1) through their waste and pollution reduction processes, (2) by contributing educational and social programs, and (3) by earning adequate returns on the employed resources.

CRM (Customer relationship management) Practices, strategies and technologies that companies use to manage and analyse customer interactions and data throughout the customer lifecycle, with the goal of improving business relationships with customers, assisting in customer retention and driving sales growth.

Cultural homogeneity Defined as the number of shared or common facts between populations; implies almost entirely similar cultural values between nations.

Culture (organisational) The set of shared values and norms that characterise a particular organisation; *"how we do things round here".*

"Cutting-edge" A term meaning the latest or most advanced stage in the development of a service.

Data mashup An IT process bringing together a variety of data from multiple sources and combining them to develop a more accurate analysis.

Data mining The process of finding anomalies, patterns and correlations within large data sets to predict outcomes or behaviours.

Data retrieval The process of accessing specific data located in a memory or storage device to be used for another purpose.

Data sets A collection of related sets of information that is composed of separate elements, but can be manipulated as a unit by a computer.

Data visualisation The presentation of data in a pictorial or graphical format.

Database Management System (DBMS) System software for creating and managing databases. The DBMS provides users and programmers with a systematic way to create, retrieve, update and manage data.

Decentralisation Where decision-making is devolved to subsidiaries or SBUs.

Decision-making The process by which individuals and organisations resolve to take action on behalf of an organisation.

Deliverables Tangible or intangible products or services produced as a result of a project.

Delphi technique for decision-making A systematic forecasting method that involves structured interactions between a group of experts on a subject, for the purpose of achieving a well-thought-through consensus.

Deductive research A logical process in which a conclusion is based on a range of factors that are assumed to be true.

Descriptive (techniques) Used in analytics, descriptive techniques use historical data to understand the relationship between different factors to help influence approaches that are taken in the future.

Diffusion (of authority) Diffusion means to spread; in this case it means spreading responsibility and authority throughout the organisation.

Distribution Distributive businesses are involved in the physical movement of goods and services from buyer to seller by whatever means of transport, internet or storage this entails.

DMU (Decision-making unit) A group of individuals in a business organisation with specific roles, such as decider, user, buyer, influencer and gatekeeper. This group will work together to make decisions, usually related to the procurement of high value products or services in B2B situations. These principles can also be adapted for other aspects of business decision-making.

EDI (Electronic Data Interchange) The computer-to-computer exchange of business documents and transactions in a standard electronic format between business partners.

Emerging themes In a changing business environment often influenced by external factors PESTLE/STEEPLE), approaches to conducting business, its operating environment and organisational cultures are changing and developing.

Environmentalism Political and ethical movement seeking to improve and protect the quality of the natural environment through changes to environmentally harmful human activities; through the adoption of forms of political, economic, and social organisation thought to be necessary for the benign treatment of the environment.

EU (European Union) The largest, oldest and most developed of the trading blocs. The EU comprises 28 nations (including the UK) and features a customs union (free trade) and a single market, as well as shared legal and political institutions.

Extractive Extractive industries are those based on mining or extracting resources, such as oil, gas and minerals from the earth.

Extranet An intranet that can be partially accessed by authorised outside users, enabling businesses to exchange information over the internet in a secure way.

Extrapolation An estimation of value based on extending a known sequence of values or facts beyond the area that is known. Known facts and observations are used directly to forecast the future.

Financial ratio analysis Mathematical comparisons of financial statements or accounts that help investors, creditors and internal company management to understand how well a business is performing and of areas that need improvement.

Functional (areas of a business) Specific activities or specialist functions that support all enterprises; these always include finance, human resources, marketing and operations, but may also include procurement, research and development and information systems.

Gantt chart Devised by Henry Gantt in early 20th century, the Gantt chart is commonly used in project management to show a series and sequence of tasks or activities within a timeframe and over a timeline.

GE McKinsey Matrix A commonly used strategy tool that offers a systematic approach for the multi-business corporation to prioritise its investments among its business units.

Globalisation The process by which the world is becoming increasingly interconnected as a result of massively increased trade and cultural exchange, resulting in the integration of markets in the global economy and the increased interconnectedness of national economies.

Glocalisation A combination of the words "globalisation" and "localisation" used to describe a product or service that is developed and distributed globally. It is also fashioned to accommodate the user or consumer in a local market.

Graphs (line, scatter) Graphs available in Excel are used to plot data trends over time (line) or the visualisation of the relationship between two variables.

Inductive research Using a set of facts or ideas to form a general principle.

Industry standard software (for analytics) A range of software packages produced by market leaders and constantly updated to support BI (business intelligence). These include software, such as Microsoft Power BI, and are designed to assimilate and manipulate large amounts of data to support predictive analytics.

Inferential statistics Makes inferences and predictions about a population based on a sample of data taken from the population in question.

Intranet A local or restricted communications network, especially a private network created using World Wide Web software.

Issue selling The process by which individuals within an organisation bring ideas, concerns, solutions and opportunities together in ways that focus others' attention and invite action.

Knowledge management Systematic management of an organisation's knowledge assets for the purpose of creating value and meeting tactical and strategic requirements. This leads to effective handling of information and resources within a commercial organisation.

Learning organisation An organisation that acquires knowledge and innovates fast enough to survive and thrive in a rapidly changing environment. Learning organisations create a culture that encourages and supports continuous employee learning, critical thinking and risk taking with new ideas.

Line management Administration of activities that contribute directly to the output of products or services. In a corporate hierarchy, a line manager holds authority in a vertical chain of command, and/or over a particular product line.

Linear and non-linear modelling Mathematical calculations to be used for future forecasting – linear implies two or more variables will maintain proportion when one is changed; non-linear perceives no or inconsistent proportional relationship between the variables, when one figure changes. For example, if sales increase by 20% and profit increases by the same %, then it is a "linear" model; if not then it is non-linear.

Marketing Communications (MarComms) Part of the marketing mix (promotion), MarComms is the overall coordination of internal and external promotional messages delivered through one or more of the following channels: print, radio, television, direct mail and digital platforms (including the web, social media and personal selling). It will also include sponsorships and other public relations activities.

Machine learning The concept that a computer program can learn and adapt to new data without human interference. Machine learning is a field of artificial intelligence that keeps a computer's built-in algorithms; similar to data mining in that it searches for patterns in data, machine learning however will interpret and report on that data.

MIS (Management information systems) A computerised database of financial information organised and programmed in such a way that it produces regular reports on operations for every level of management in a company.

Not-for-profit A type of organisation that does not earn profits for its owners. All of the money earned by or donated to a not-for-profit organisation is used in pursuing the organisation's objectives and keeping it running. Revenue made over and above its running costs is called a surplus, and this will be reinvested to continue or grow its operations.

OECD (The Organisation for Economic Co-operation Development) A group of member countries that discuss and develop economic and social policy. OECD are democratic countries that support free market economies.

Optimisation The action of making the best use of resources or situations; maximising and managing the values of the variables that lead to the best possible outcome for all the variables identified.

Pareto effect Pareto analysis is a statistical technique in decision-making used for the selection of a limited number of tasks that produce a significant overall effect. It uses the Pareto Principle (also known as the 80/20 rule) – the idea that by doing 20% of the work you can generate 80% of the benefit of doing the entire job.

PESTLE A mnemonic standing for Political, Economic, Social, Technological, Legal and Environmental. This is an analysis which reviews past trends and future predictions to understand the changing nature of the external macro-business environment.

Pilot testing A small scale trial to test impact and performance. For example, to test a survey to see if it provides information required to help forecast the future.

POPIT Acronym for People, Organisation, Processes, Information and Technology. It is used to analyse current business systems in order to determine what may need to change or be developed to improve the overall business systems.

Porter's Five Forces Competitive Analysis An analysis tool used to determine the intensity of rivalry within an industry. The Five Forces are competitor rivalry, bargaining power of suppliers and customers and the threats from substitutes and new entrants.

Porter's Generic Competitive Strategies A commonly used matrix defining the ways in which a business can gain a competitive advantage through cost leadership, differentiation and focus.

Porter's Value Chain Helps to identify links in the process of delivering goods and services to a customer and the value added that can be derived when the individual elements work together to form the most effective and efficient outcome.

Predictive (techniques) Uses analytics to provide estimation of the likelihood of a particular outcome or forecast for the future, based on large sets of data patterns, statistical models and algorithms to capture relationships in various data sets.

Prescriptive (techniques) The final stage of descriptive and predictive techniques (above), prescriptive analytics use many different techniques to foresee the future, when it will happen, why and advise how to act to take advantage of the prediction. The interpretation will affect future decisions and can have a large impact on the business by making it become more effective and efficient. Prescriptive analytics can optimise scheduling, production, inventory and the supply chain.

Principal/client The individual or company who has commissioned a project or investigation.

Prioritisation To arrange decisions requiring action in the order of their relative importance.

Problem solving The process of finding solutions to difficult or complex issues.

Procurement The act of obtaining and buying goods or services. The process includes preparation and processing of a demand as well as the end receipt and approval of payment. This often involves purchase planning, standards and specification, supplier research and selection, value analysis, financing, price negotiation, purchase, supply contract administration, inventory control and disposals.

Project management The discipline of initiating, planning, executing, controlling and closing the work of a team to achieve specific goals and meet specific success criteria.

QMS (Quality Management Systems) A set of policies, processes and procedures required for planning and execution (production/development/service) in the core business area of an organisation. (i.e. areas that can impact the organisation's ability to meet customer requirements.)

Regression analysis (Multiple) regression analysis is a powerful technique used for predicting the unknown value of a variable from the known value of two or more variables – also called the predictors.

ROI (return on investment) Measures the gain or loss generated on an investment relative to the amount of money invested. ROI is usually expressed as a percentage and is typically used for financial decisions, to compare a company's profitability or to compare the efficiency of different investments.

SBU (Strategic Business Unit) A profit centre within a larger organisation that is responsible for generating its own income, developing its products and managing its financial operations. The functional areas of a business (e.g. marketing) are controlled by the individual SBU.

SERVQUAL© is a multi-dimensional methodology which evaluates service quality based on RATER (Reliability, Assurance, Tangibles, Empathy and Responsiveness) against importance (to the customer), expectations and then performance.

Shareholder or stockholder An individual or institution (including a corporation) that legally owns one or more shares of stock in a public or private company. They have invested in the business for the purpose of increasing their asset value (shareholding) and to gain returns on their investment (dividends).

SME (small to medium-sized enterprises) Organisations are usually classified by the number of employees. A small enterprise has fewer than 25 employees, whereas a medium-enterprise has up to 250. There are also micro-organisations with fewer than five.

SMART objectives The SMART acronym stands for specific, measurable, achievable/attainable or agreed, realistic or time-bound. All objectives should be written in these terms. An example for a sales department would be: "Sales will be improved (specific) by 5% (measurable) in the southern region (agreed) above last year's achievement (realistic) for the next two years (time-bound)."

Statistical Process Control (SPC) Manipulations of a defined process, based on analysis of statistics from the process to bring about a desired change in the output characteristics of a process.

Stakeholder A party (individual or group) that has an interest in a company, and can either affect or be affected by the business. The primary stakeholders in a typical business are its investors (shareholders), employees and customers. But any individual or group may be relevant stakeholders, including activists or trade unions.

STEEPLE An extension of the acronyms PEST/STEP/PESTLE that are used to analyse trends in the business environment. It stands for Social/demographic, Technology, Economic, Environmental, Political, Legal and Ethical. The importance of ethics in the contemporary business environment has merited a separate analysis.

Suitability, Acceptability, Feasibility (SAF) A means of evaluating particular alternatives to select the most appropriate option. SAF uses various models and rating systems to test the suitability, acceptability and feasibility of the alternatives.

Sustainability (business) A process by which companies manage their financial, social and environmental risks, obligations and opportunities. These three impacts are sometimes referred to as profits, people and planet.

SWOT Well known acronym for strengths, weaknesses, opportunities and threats used by decision-makers to summarise and interpret a company's capabilities to exploit opportunities and withstand or overcome barriers and threats. Strengths and weaknesses are internal to the company whilst opportunities and threats are always external to the organisation.

"Top-down" strategy A strategy developed by the corporate heads of an organisation and then directed, imposed and communicated down through the SBUs and the functional areas of the business.

Trading Bloc (regional) A group of countries within a geographical region that protect themselves from imports from non-members. Trading blocs are a form of economic integration and increasingly shape the pattern of world trade.

Triple bottom line Concerned with sustainability of business and the natural environment, triple bottom line values organisations by the quality (sustainability) of people, power and planet.

VACS Acronym for Valid, Accurate, Current, Sufficient; a reminder to check whether data meets these criteria so that information gathered can be used for effective analysis and to make judgements.

Whistle blowing The disclosure by a person, usually an employee in a government agency or private enterprise, to the public or to those in authority, of mismanagement, corruption, illegality or some other wrongdoing. Where the concern is deemed genuine, there may be protection for the whistleblower in law.

WTO (World Trade Organization) Comprising 160+ nations, the WTO provides a forum for countries to negotiate trade agreements with participants and to facilitate settlement of any disputes. The purpose is to support free trade and economic development – it has been particularly influential in the support for the development of emerging nations.