

**Lesson
Five****Management Decision-
Making****Aims**

This lesson should enable you to understand:

- the value of decision-making based on scientific decision-making
- the use and value of decision trees in decision-making
- the influences on decision-making

Context

This lesson focuses on understanding and interpreting decision trees and how decisions influence an organisation in terms of achieving objectives, mission and resource constraints.



Marcousé, Unit 94.



Oxford Open Learning

Decision-making to Achieve Objectives

This lesson will focus on understanding and interpreting decision trees and calculating expected value and net gains and it will investigate the different influences on decision-making including mission, objectives, ethics, the external environment and resource constraints. As we saw in lesson four, managers have to make a variety of different decisions and this lesson will provide some of the tools to help them to do this.

We have seen over and over again that true objectivity is an illusion in business. There are no certainties, otherwise all entrepreneurs would be millionaires. Sceptics would say that it is an art form which has taken on the trappings of a science. Historical data takes on the appearance of objectivity but it is only of value when it is extrapolated into the future (by one technique or another), in which case any number of other factors and trends will take effect. External influences should rarely be under-estimated or, to put it another way, luck is crucial. Even the biggest of organisations, maintaining a near-monopoly in certain business sectors, are still at the mercy of outside decision-makers. A company as big as Microsoft can face an anti-trust law suit from the American government itself and the possibility of being compelled to break itself up.

In the UK, many businesses can be operating successfully enough only to find that the VAT Office takes a fresh look at their trading arrangements and suddenly demands 20% VAT from them on all their turnover, probably going back several years. Hardly any companies can afford to lose 20% of their income for “nothing” out of the blue. Because it is so hard to fight such cases, the company goes from being profitable to being insolvent overnight. A business cannot plan and legislate for blows like that.

Business is not a “zero game” like football or chess (where for every winner there must, by definition, be a loser) but it is not far short of it. The world has a finite set of resources which can be distributed in one way or another. If one entrepreneur corners more than his share of money or resources, there is a suspicion that someone somewhere else is losing out. Individuals like Bill Gates may earn more in a year than an entire “less developed” country but that is not necessarily a situation which should be applauded. If every entrepreneur in the world was armed with the same set of highly-developed business skills, would everyone would be rich? Logically, no. Indeed, no one has ever proved that the more highly trained the entrepreneur, the more successful he or she will be. Many of the top businessmen and richest entrepreneurs have very little formal training or qualifications.

During the 1990s a battle was fought at Oxford University over the existence of a business faculty within the university. Many of the top academics argued that business does not have the intellectual rigour or even the socio-moral validity to justify a faculty devoted to studying it. Eventually, the success (commercial, at least) of the Harvard Business School and others led to the crumbling of the walls of academe and a modest faculty was allowed to develop. Eventually a huge donation from Wafiq Said allowed a business school to be built in Oxford but it was still regarded with much condescension by academics in older disciplines. Yes, it might make money for the university and improve its international profile but what is a university *for*?

Business studies will never be a pure discipline. It takes a little psychology (itself a subject treated with much scepticism until relatively recently), a little economics, a little mathematics and a little from a range of other subjects and combines these ingredients into a disparate whole. But who is to say where the subject starts and stops? In many ways, it is surprising how much of a consensus has developed in the component parts of the subject.

Significance of information management

To any business data is crucial. Without data, management in a business can struggle to make the correct decisions. There are two different methods to making a decision – one which is evidence based (scientific) or decisions based on a hunch. Neither technique has proved better than another. Sometimes a quick decision is needed and there is insufficient time to gather and analyse the data and therefore a hunch will have to be followed. Larger businesses will tend to have systems in place for decision-making and will tend to use a scientific approach.

Internal and external influences on decision-making

Almost everything within a business is influenced by internal and external factors. Some internal factors could include:

- What finance is available?
- What skills do staff have?
- Can the decision be implemented?

Some external factors could include:

- What legislation impacts on the decision?
- What are competitors doing?
- What is the economic climate?

- What are the mission/objectives of the organisation?
- How ethically does the organisation behave?
- What are the resource constraints

An organisation's mission is likely to have a great impact on any decisions that are made. For example, Oxfam's mission statement is "to create lasting solutions to poverty, hunger and social injustice" and therefore any decisions they make would need to reflect this mission statement.

If an organisation had as its sole objective to grow sales, then any decisions would need to support that objective, e.g. cutting prices to grow sales. However, if the objective was to maximise profit, then a decision to cut prices might grow sales, however it would be likely to reduce profit in the short term and so run counter to the stated objective.

Business ethics are important and crucial to some organisational success. Some organisations have decided to "go green" by getting employees to recycle, or use lorries which are environmentally friendly or buy recycled or organic foods. If this becomes a stated objective, any decisions would need to reflect the ethics of the business, for example paying a "fair" rather than "minimum" wage.

Resource constraints also influence decisions. What staff do you have? What skills do they have? Can you afford to employ more staff to grow sales by increasing production? All of these different factors have to be considered and influence business decisions.

The value of decision-making

When making any decisions, the ideal is to base them on scientific data. An example is analytics. When you visit a website, data is stored on your computer and known as a "cookie". Google can track your journey through the internet and, for a business, this is important as it can identify those customers that have visited a website, how long they have spent on a website, the website they came from and went to and any purchase they made.

This data can then be used in many ways, e.g. to send marketing material to customers. Data is collected about us now every second, where we are (location apps on mobile devices), where we have been, who we have connected with, what pages we have looked at on the internet and devices will soon track how fast we drive down a motorway. All this scientific data is essential to businesses to make decisions.

Objectivity and risk

However, there are some risks in this approach to decision-making. A good manager will anticipate the risks of using historical data or past experience and use this to identify the severity of the risk when making a decision. The result could be that the decision is aborted or watered down to make it less of a risk to the business. However, sometimes a business needs to take risks to reap rewards. For example, an entrepreneur has to take risks to start up the business and when making decisions. Such individuals are likely to weigh up the risks and uncertainty when making a decision as the rewards are judged to outweigh the risks in terms of income, challenge, growing the business or being in control. These rewards give the entrepreneur a buzz.

For any choice made, there are other choices that are *not* made. **Opportunity cost** applies to the alternative product or service or benefit that has been sacrificed when making a choice between scarce resources. For example, you have a limited budget and have to choose between a holiday and a repair to your car. If you choose the holiday then the opportunity cost would be the (now unaffordable) repair to your car. The same applies in business when a business chooses to make one product; what is the opportunity cost had they chosen to make another product?

Decision Trees

A decision tree is a method using a diagram which sets out the possible outcomes of alternative decisions.

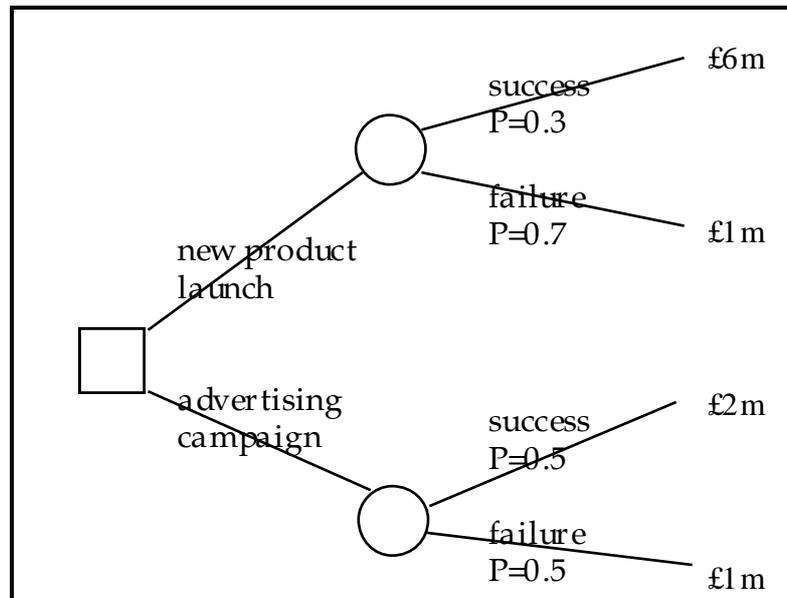
It shows the decisions and the chance events, together with an estimate of the probability of their occurrence. It sets out the expected values or “pay-offs” to be expected.

Probability is the likelihood of an event occurring expressed as a fraction of 1. Most probabilities fall between 1, a certainty, and 0, an event which will definitely not occur.

The value of decision trees is that they set out problems clearly and allow for a logical approach to decision-making, showing not only expected values but also the probability of each event occurring.

The problem with decision trees is that probabilities and pay-off values are difficult to estimate and can be distorted by a manager wishing to prove a case.

An example of a decision tree is shown below:



- Squares** are called **decision nodes** – the points at which decisions have to be made.

- Circles** are called **chance nodes**. A chance node shows that a particular course of action can lead to several outcomes, e.g. success or failure. The likelihood of a particular outcome is shown by the probability (P) as a fraction of one.

Interpreting the Diagram

The figures on the right-hand side (e.g. £6m) indicate the revenue (or sometimes increased revenue) that will result if the events (in that line) occur. “Failure” may be a positive or a negative figure. An advertising campaign which “fails” might still yield *some* increase in sales or it might even reduce sales. In this example, all the figures are positive.

The Expected Value of the new product launch is:

$$(0.3 \times \text{£}6\text{m}) + (0.7 \times \text{£}1\text{m})$$

$$= \text{£}1.8\text{m} + \text{£}0.7\text{m}$$

$$= \text{£}2.5\text{m}$$

This is higher than the Expected Value of the advertising campaign for an existing product:

$$(0.5 \times \pounds 2\text{m}) = (0.5 \times \pounds 1\text{m})$$

$$= \pounds 1\text{m} + \pounds 0.5\text{m}$$

$$= \pounds 1.5\text{m}$$

This suggests the new product launch should be chosen. Of course, in business, it is rarely a simple either/or choice. It could be that, if internal resources allow, both courses of action are possible simultaneously (with a total expected value of $\pounds 4\text{m}$).

Using decision trees can be very useful for managers because they:

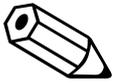
- make managers think about the different options they have and consider the possible consequences of each one
- force managers to quantify the possible consequences of each option
- help managers to compare the available options logically

However decision trees do have various limitations and drawbacks.

- Decision trees use estimates of the probability of different outcomes and the financial consequences of each outcome. The value of decision tree analysis is heavily dependent upon the accuracy of these estimates.
- Decision trees only include financial and quantifiable data; they do not include qualitative issues such as the workforce's reaction to different options or the impact on the firm's image.

Activity 1

ABC Foods have been making Corn Flakes for many years and the product has high market share in a mature food industry with slow growth rates (a "cash cow"). The corn flakes have started to lose market share to supermarket brands and the board of ABC foods have decided that they must do something to stop them losing more revenue. They have two options to consider:

**Option A** – Change the recipe of cornflakes

Total cost - £500,000

Probability of success – 0.6

Expected profit if successful - £5,000,000

Expected profit if unsuccessful - £1,000,000

Option B – Produce a new advertising campaign

Total cost - £300,000

Probability of success – 0.2

Expected profit if successful - £9,000,000

Expected profit if unsuccessful - £2,500,000

Draw decision trees to analyse each option and recommend which one you would select and why.

Self-Assessment Test: Lesson Five

1. Which of the following would be classed as an internal influence?
 - a) Legislation
 - b) Competitors
 - c) Motivation of staff

2. Which of the following would be classed as an external influence?
 - a) What skills do staff have?
 - b) What type of equipment do we have?

- c) What is the economic climate?
3. Which of the following describes decision tree?
- a) It models decisions and consequences including outcomes.
 - b) It models data which shows the frequency of data.
 - c) It plots numerical data in proportion.
4. Squares in a decision tree represent which of the following?
- a) Actions
 - b) Decisions
 - c) Ends

Summary:

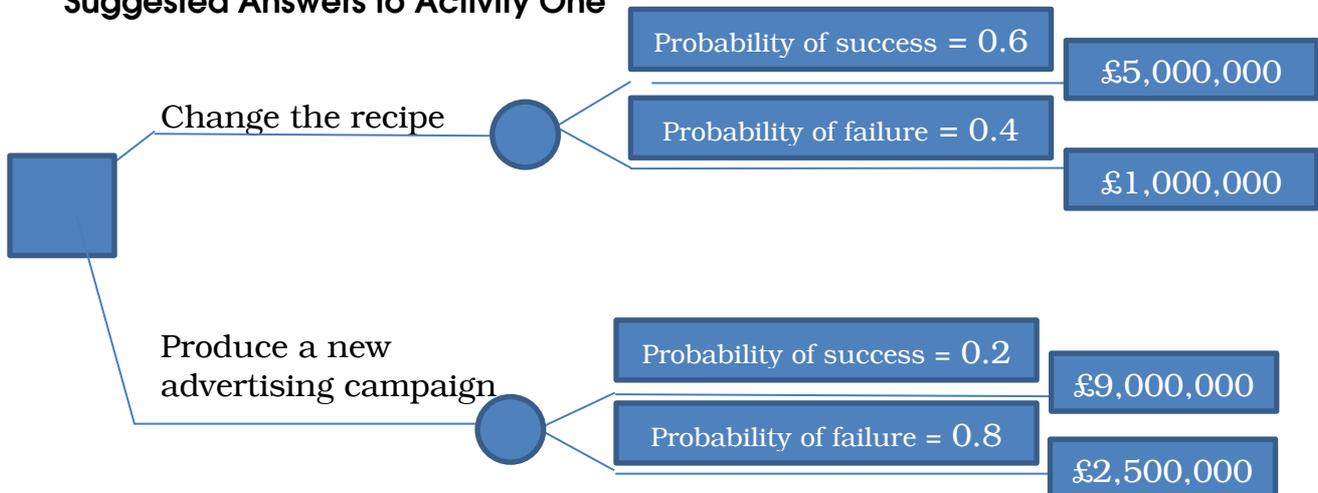
This lesson has covered the following important topics:

- Decision-making based on financial data
- The use and value of decision trees in decision-making
- Influences on decision-making



Now read, Marcouse, Unit 94. Please work through the B2 Case study on page 581.

Suggested Answers to Activity One

**Option A**

Success = £5,000,000

Failure = £1,000,000

Expected value = £5,000,000 × 0.6 and £1,000,000 × 0.4

Expected value = £3,000,000 and £400,000 = £3,400,000

Costs = £500,000 and therefore

Net gain of £2,900,000

Option B

Success = £9,000,000

Failure = £2,500,000

Expected value = £9,000,000 × 0.2 and £2,500,000 × 0.8

Expected value = £1,800,000 and £2,000,000 = £3,800,000

Costs = £300,000 and therefore

Net gain of £3,300,000

Therefore should go for the new advertising campaign. (There may also be a case for doing both, of course.)