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Introduction to Applied Innovation

General Introduction

Few topics have exercised the minds of managers as much as innovation. Yet for most of them, it continues to remain a mystery. The application of innovation in specific organisations remains difficult to understand and stubbornly difficult to apply. Despite the many books and articles published on innovation, managers continue to face the same persistent question: 'How can innovation be applied in my organisation?' There is a new urgency around why companies need to understand and apply innovation. In a global economy there are great opportunities if companies can anticipate the needs of customers and introduce new products, processes and services that meet these needs. On the other hand, if companies do not innovate, then there are many competitors around the world, who will.

How can innovation be applied in any organisation?

The aim of this module is to give you some important insights into how innovation management can be put to work in any organisation. It contains a systematic approach to managing innovation. The author has brought together a number of practical tools and techniques that can be used to improve the innovation process. The module includes a range of ideas that are easy to implement and have worked very successfully in leading companies throughout the world. This module also contains a series of case study elements at the end of each unit or section that combine together into one case study. This case study is combined with an assignment that you must complete as part of the assessment for this module.

When you have completed this module you will be able to:

- Explain key concepts in the theory and process of innovation
- Use explicit skills for defining goals, generating ideas, empowering teams and monitoring the results of innovation
- Develop a simple knowledge management system
- Work effectively as an individual and as a member of a team
- Present, communicate and promote your innovation plans
- Apply critical thinking and problem solving to the application of innovation in any organisation
- Adopt networking and customer centric techniques in the gathering of information for innovation
The text in this module draws heavily from the textbook *Applying Innovation* by David O'Sullivan and Lawrence Dooley, and published by Sage Publishing, Los Angeles. You are encouraged to research relevant sections in this textbook as you progress through this module.

The module contains 16 units as follows:

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<th>Brief Description</th>
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<td>2  Making Changes</td>
<td>Understanding the process of change in organisations</td>
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<td>3  Managing Innovation</td>
<td>Why innovation is important and how to manage the process</td>
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<td>4  Processing Innovation</td>
<td>More detailed look at the innovation process and the innovation funnel metaphor</td>
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<tr>
<td>5  Defining Goals</td>
<td>Defining innovation goals such as requirements and objectives</td>
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<td>6  Understanding Requirements</td>
<td>Detailed look at understanding stakeholders and their requirements</td>
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<td>7  Defining Objectives</td>
<td>Detailed look at the strategic planning process and the creation of objectives</td>
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<td>8  Managing Indicators</td>
<td>Detailed look at performance indicators and the relationships with other goals</td>
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<tr>
<td>9  Generating Ideas</td>
<td>Tools and methods for solving problems and generating and evaluating ideas</td>
</tr>
<tr>
<td>10 Managing Projects</td>
<td>Managing projects that emerge from ideas and other initiatives</td>
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<tr>
<td>11 Managing Portfolios</td>
<td>Managing a group of projects and keeping a balance of innovative actions</td>
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<tr>
<td>12 Leading Innovation</td>
<td>Leadership in the innovation process including team leadership and empowerment</td>
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<td>13 Building Teams</td>
<td>Innovation teams, team structures and team behaviors</td>
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<td>14 Motivating Performance</td>
<td>Motivating and empowering individuals to innovate and be part of a team</td>
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<td>15 Monitoring Results</td>
<td>Monitoring the results of the innovation process — goals, actions and teams</td>
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<td>16 Mapping Relationships</td>
<td>Understanding and mapping relationships between goals, actions, teams and results</td>
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Assessment

This module will be assessed by a combination of written examinations and assignment. Some marks will be allocated for interaction with online activities such as discussions forums, sharing of learning activities, etc.

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Section 1.1
Unit Introduction

Innovation is about helping organisations grow. Growth is often measured in terms of turnover and profit, but growth can also occur in knowledge, in the experience of people, and in the efficiency and quality of processes and services. This unit describes the main concepts behind innovation. We define innovation as the process of making changes. We then classify innovation around products, processes or services. The unit discusses the difference between radical and incremental innovation, and in particular the impact of disruptive technologies.

Section 1.2
Unit Learning Objectives

When you have successfully completed this unit you will be able to:

- Define innovation and explain the difference between ‘innovation’ and ‘invention’
- Explain the difference between product, process and service innovation
- Explain radical and incremental innovation
- Give examples of disruptive technologies

Section 1.3
Definition of Innovation

Innovation is defined in the *New Oxford Dictionary of English* (1998) as: ‘Making changes to something established by introducing something new.’

This definition does not suggest that innovation needs to be radical or that it needs to happen exclusively to products. Innovation is often mundane and incremental and can happen to products, processes and services.

The term ‘innovation’ is often confused with the term ‘invention’ which is defined in the *New Oxford Dictionary of English* (1998) as: ‘Creating something new that has never existed before.’

Invention is often about creating something that has yet to be desired by a customer.
Change can be either positive or negative. Negative outcomes are seen as a natural by-product of the innovation process. In order for some ideas to succeed, many more ideas will fail. When one company succeeds, it is usually at the expense of other companies. Companies which can manage positive innovation will grow, and those that cannot will decline.

**Learning Activity 1.1**

Search Online: [http://inventors.about.com/](http://inventors.about.com/) and review what some inventors are sharing about their ideas.

Write a note about your findings and post to the discussion forum. What did you find most interesting, and why?

**Case:** The old tube television was an invention. Before it existed, people had no desire for it. It did not make changes to something already established. When it was created, it established something new that never existed before. The new flat-screen television, on the other hand, was an innovation. It met a desire from customers to have flatter, higher-definition television sets. It made changes to the already-established tube television. When Philips introduced the ‘Interactive TV’ in the 1980s, some analysts viewed it as yet another innovation by a company renowned for its innovation processes. They argued that it could disrupt the traditional television market. However, customers found the new interactive TV too expensive and too cumbersome to use. The Interactive TV failed to succeed as an innovation and was replaced by more successful ideas.

In innovation, destroying poor ideas is often as important as nurturing good ones. And every good idea usually replaces an established one. To express positive innovation, we need an important addendum to our definition:

‘Innovation is the process of making changes to something established by introducing something new... that adds value to customers.’

This addendum is important. By classifying an innovation as ‘adding value to customers’ we assume that customers who experience the added value will continue to purchase or use the product or service. This is turn will lead to greater revenue and growth for the organisation.

A customer is anyone who purchases or uses a product or service. Customers can include students who use a service in a university, patients who use services in a hospital or the general public who use the services of a local authority. Customers can also be internal within an organisation. Lecturers who are part of the university and who offer a service to students are themselves customers of, say, the library. Doctors who deliver a service to patients in hospitals are themselves customers of a particular laboratory, and receptionists in local authorities are themselves customers of, say, the computer services department.
Innovation management is the process of managing innovation within an organisation and frequently between organisations i.e. managing ideas, goals and projects, improving communications, managing innovation teams, and so on.

As you will see later, innovations have particular lifecycles. Today's innovation will become obsolete in the future, and for organisations to sustain their mission they must learn how to innovate and replace existing products, processes and services with more effective ones. This 'learning' element adds a further extension to our definition:

‘Innovation is the process of making changes to something established by introducing something new... that adds value to customers... and then learning from that process so that innovation can be repeated continuously’.

Innovation management is the process of managing information, people and changes associated with innovation so that value can be added to the organisation’s customers.

An alternative definition of innovation regards it in commercial terms. Martin (1994) defines an ‘invention’ as the technical solution to a question or problem, while an ‘innovation’ is the economic implementation of the invention. An invention is an idea, a drawing or a model for a new or improved device, product, process or system. Inventions can be patented but do not necessarily lead to marketable goods and services. This only happens through innovation.

### Section 1.4
Product, Process and Service Innovation

The term innovation is often associated with products. When we think about innovation, we think about a physical product e.g. a television. However, changes can also be made to processes that make products and to services that deliver products. There are also many examples of innovation applied to restructuring the organisation.

We can say that innovation makes changes to:

- Products
- Processes
- Services

Product innovation is about making changes to physical products. For example:

1. introducing a new screen size in television sets,
2. changing from the old tube television to flat screen televisions, or
3. adding functionality such as internet access to televisions.
Process innovation is about making changes to the processes that produce products. For example:

1. building new machines that assemble televisions,
2. redesigning the assembly line so that televisions can be manufactured more cheaply, and
3. outsourcing the production of the plastic covers on televisions so those costs can be reduced and quality improved.

Service innovation is about making changes to services that customers use. For example:

1. changing the way dealers sell new televisions in order to keep costs low, changing the way customers get rid of their old televisions by introducing a ‘take back’ policy, and
2. changing the way customers purchase televisions over the internet.

Clearly, services do not necessarily involve products. Services can also be developed around needs for government information, health services and so on.

Case: Low cost airlines Ryanair and EasyJet grew dramatically in the 1990s because of innovations they adopted in their online purchasing and ‘no frills’ approach to air transportation. Giant rivals, such as British Airways, were quickly overtaken in terms of company value on the stock exchange, so much so that they had little choice but to adopt the same no frills innovations in order to compete. Customers no longer expected meals, but rather were attracted by the low cost and high efficiency that came with buying their own tickets online.

Each of these innovations adds value for customers.

If customers use products that have more reliability, quality, function, aesthetics and value for money then they will return to purchase similar products again.

Innovative processes will yield better quality, reliability and lower costs. Innovative services will satisfy customer demands for efficiency, courtesy, environmental friendliness and so on.
Section 1.5
Radical and Incremental Innovation

The definition of innovation makes no reference to the size and scope of the change to the product, process or service. For example, introducing a new flat-screen television is clearly a major or radical change to the older established television market. However, what if we made a smaller change, such as changing the colour or the size of the screen?

Innovation can be either:
- Radical
- Incremental

Radical innovation is about making major changes in something established.

The term ‘radical’ often refers to the degree of change in the efficiency or revenue of the product (MacLaughlin 1999). For example, by introducing the flat-screen television, manufacturers radically increased the demand for such televisions. We can visualise radical innovation as a ‘step change’ in some measure of performance, such as revenue or efficiency, see Figure 1.1. Most organisations engage in some form of radical innovation over their lifetime.

Radical innovation is a ‘step change’ in some measure of performance such as revenue or efficiency.

Figure 1.1: Radical and Incremental Innovation

Radical innovation can lead to step changes in performance, however it is also often resource intensive and risky.
A high level of risk is not possible for many companies, which prefer instead to invest in incremental innovation or continuous small changes to their products, processes or services. Incremental innovation, such as changing the colour or screen size of televisions, often leads to small changes in growth. If a company makes many of these small changes, then it can sometimes lead to the levels of growth comparable to radical innovations. Incremental innovation projects include approaches to ‘Continuous Improvement’, ‘Lean Manufacturing’, ‘Total Quality Management’ and ‘World Class Manufacturing’.

Learning Activity 1.2
Do an online search using these terms:
Continuous Improvement
Lean Manufacturing
Total Quality Management
World Class Manufacturing

Find a good definition for each one, and write a short description of how each approach can be implemented to improve processes in a manufacturing organisation. Add to your portfolio.

Learning Activity 1.3
Take one of these approaches and apply it to some process in your own organisation which needs improving. Explain the current state of play in the process, what needs improving, and how the chosen technique could bring about improvement.
Add to your portfolio.

Incremental and radical innovation each has its advantages and disadvantages. Radical innovation has the advantage of creating a step-change in revenue or efficiency. The disadvantage is the level of risk and high cost of failure. The advantages of incremental innovation are lower risk and possibility of making small changes to revenue or efficiency. However the disadvantage is being slow to reach growth targets before competitors.

Case: Philips invested significant resources — time and money — into the development of its Interactive TV. Customers did not purchase the interactive TV in sufficient quantities to allow Philips reach their revenue targets i.e. the innovation failed. Not only did Philips lose money but they lost time in coming up with a better innovation. If interactive TV had succeeded, then certainly Philips would have had an enormous head start over their competitors and would almost certainly have created a step change in their revenues.
Most organisations will adopt a dual approach to the size and scope of their innovation activities.

They will have many incremental innovations going on at once that will yield results in the short term. They will also have some potentially radical innovations that may yield significant results in the long term.

Section 1.6
Disruptive Innovation

Every now and then, a radical innovation is introduced that disrupts business practice (Christensen 1997). In other words, business practice itself changes radically. These disruptive innovations often occur through new sciences and technologies. For example, television originally depended on a technology called the ‘vacuum tube’ for its operation. Owners of these televisions waited up to a minute for the tubes to heat up and produce an image on the screen. In the 1970s, research into electronics produced the ‘transistor’ which offered much lower production costs, lower energy consumption, higher reliability and the screen on the television ‘lit up’ in about five seconds. The transistor dramatically changed or disrupted business practice around the design and manufacture of televisions. Early adopters of transistors make significant increases in market share. Slow adopters went out of business.

Disruptive innovation is radical innovation that disrupts an entire market to the point that the old way is no longer relevant for customers.

There are many examples of disruptive technologies introduced in recent years including:

- Digital Photography
- Radio Frequency Tags
- Digital Media (Music and Video)
- Internet and World Wide Web
- Text Messaging and the Mobile Phone

Arguably the largest disruptive technology to emerge in recent years has been the World Wide Web.

The web has disrupted products, processes and services. Products such as televisions can now be web enabled, allowing customers a host of new services such as video download and internet browsing. Processes such as the manufacturing of televisions regularly use the web to source materials and receive orders from television dealers. Services such as film rental now use the
web to offer customers the latest films which are then downloaded directly to their television on demand.

**Case:** Radio Frequency Detection (RFD) tags are now being used as a replacement for bar codes on products in supermarkets. The current process of purchasing goods in a supermarket is well known to most of us. We wait in line at the supermarket checkout and scan the bar code of each individual item before paying. RFD tags can be detected remotely by receivers. If all of the items in our basket have RDF tags, then all we need to do is push the shopping basket under such a receiver. It will remotely detect every item in the basket. The value for customers is shorter lines at the checkout or the replacement of checkouts altogether. Suppliers and supermarkets who adopt RFD tags will clearly attract more customers over their slower rivals.

**The source of disruptive technologies is typically research laboratories.**

Most companies watch out for new technologies that emerge from research laboratories in order to choose potential winners and then quickly adopt them for new products and services. Some companies such as Philips have their own research laboratories and work in cooperation with universities in order to develop new disruptive technologies. Many disruptive technologies take many years to develop. Companies protect their ideas through patents and later either adopt them or license them to other companies. The driving force in creating disruptive technologies is the same as for incremental innovation — to add value for customers that will make them purchase products and services repeatedly from the same organisation.

**Learning Activity 1.4**

Search Online: http://mitworld.mit.edu/ and look up Christensen.
Write a list of key points on what you learn.
Add to your portfolio.

**Section 1.7**

**Case Study**

SwitchIt Ltd. is an Irish manufacturing company and part of the SwitchIt Corporation in the U.S.A. SwitchIT manufactures electrical light switches. Marketing is the responsibility of a sister organisation based in Brussels and Design is currently concentrated in the U.S.A. There are currently 200 employees at the Irish facility. Over the last 15 years the company has built up a mature manufacturing facility for the European markets. The company is responsible for generating a turnover of €500m. This year the company is
investing €12m in process innovations, cost improvements, new technology, information systems development and capacity adjustments. A special budget of €1.4m has also been allocated to establish a new design department. Switchit manufactures a range of 'wall switches' (see Figure 1.2: Light Switch). The manufacturing facility has a range of machining and assembly stations that produce the switches in batches that meet design specifications and customer orders and forecasts.

![Figure 1.2: Light Switch](image)

**Section 1.8**  
**Unit Review**

Unit 1 began with definitions:  
**Innovation:** 'Making changes to something established by introducing something new.'
**Invention:** 'Creating something new that has never existed before.'

Our definition of innovation:  
'Innovation is the process of making changes to something established by introducing something new... that adds value to customers... and then learning from that process so that innovation can be repeated continuously.'

We can say that innovation makes changes to:

- Products
- Processes
- Services

If customers use **products** that have more reliability, quality, function, aesthetics and value for money then they will return to purchase similar products again.

Innovative **processes** will yield better quality, reliability and lower costs.
Innovative services will satisfy customer demands for efficiency, courtesy, environmental friendliness and so on.

Innovation can be either **Radical** or **Incremental**.

**Radical innovation** is about making major changes in something established. Radical innovation is a 'step change' in some measure of performance such as revenue or efficiency.

**Incremental** or continuous innovation is about making small changes to products, processes or services.

Most organisations will adopt a dual approach to the size and scope of their innovation activities.

**Disruptive innovation** is radical innovation that disrupts an entire market to the point that the old product, process or marketing approach is rendered completely obsolete.

Arguably the largest disruptive technology to emerge in recent years has been the World Wide Web.

The source of disruptive technologies is typically research laboratories.

There is a special relationship between process and product innovation. In this context all changes large or small to an organisation are classified as innovation.

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**Section 1.9**

**Self-Assessment Questions**

1. Explain the difference between innovation and invention.

2. Give one example of each of the following types of innovation: (i) product, (ii) process and (iii) service.

3. Give one example of a radical innovation and one of an incremental innovation.

4. What is a disruptive technology?
Section 1.10
Answers to Self-Assessment Questions

1 Invention is about creating something new, something that has never existed before e.g. the first light-bulb. Innovation is about making changes to something established by introducing something new and that adds value to customers e.g. changing the colour of a light-bulb, which in turn attracts more consumption of light-bulbs by customers.

2 Examples given in the text include: Product Innovation: The next model of mobile phone that attracts even more customers. Process Innovation: changing the layout of an assembly line so that products are produced faster. Service Innovation: Using the internet for online booking of airline tickets.

3 **Radical innovation**: Designing a mobile phone that also holds 1000 music soundtracks.

   **Incremental Innovation**: changing the colour of a mobile phone.

4 Disruptive technology: A technology that changes an entire business market. For example MP3 music downloads is currently disrupting the traditional music CD market. In the near future, Music CDs will be obsolete and customers will purchase music over the internet.
Making Changes

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Section 2.1
Unit Introduction

Innovation is defined as the process of making change. Changes occur to products, processes or services. The terms ‘innovation’ and ‘change’ are often used interchangeably.

Change management is often treated as a generic type of change in organisations and that includes broader issues such as the psychology behind change. Innovation management is a more applied type of change and often focuses on idea generation and project management.

In fact, the differences between both approaches are very small. Indeed, there are a number of other approaches which also fit the general definitions of change. They include project management, total quality management, business process reengineering, systems design, and so on. All of these approaches have much in common with innovation.

In this unit, we look at change management and how it relates to innovation management. We begin by looking at the nature of change in organisations. We then look at one approach to managing change in any organisation. Later the section discusses a number of common approaches to change which together with innovation management make up a broad family of approaches for managing change. The section concludes with some discussions on classifications of change and approaches to reducing resistance to change.

The terms innovation and change are often used interchangeably: innovation is always positive, but change can sometimes be negative

Section 2.2
Unit Learning Objectives

When you have successfully completed this unit you will be able to:

• Explain the difference between planned and emergent change
• Explain the difference between change management and innovation management
• Explain the various ways that employees resist change
• Explain how a number of techniques have converged to create how organisations currently approach managing change
• Describe a number of key steps useful for creating change in any organisation
Section 2.3
Nature of Change

Change is the process of converting an organisation from its current state to some future desired state.

Every organisation needs to go through change to meet the needs of its various stakeholders, including customers.

Change can be planned or emergent (Tidd, Bessant et al. 1997).

Planned change is a formal and typically annual process of converting the organisation from one state to another. The organisation goes through three stages — unfreezing, change, and then refreezing. Each year, for example, a new initiative is begun by senior management to create change. The initiative is usually based around some ‘technique du jour’ or ‘technique of the day’. There have been many techniques used in the past. These include, for example, projects around total quality management, business process reengineering, lean manufacturing, six sigma, and so on.

Planned change is a formal process of transforming the organisation from one state to another.

A programme or plan is created which identifies what needs to be changed, by whom, and when. The present state of the organisation is usually articulated in terms of understanding current products, processes, organisation structures and so on (see Figure 2.1). The future state of the organisation can be articulated through the goals, ideas and projects that need to be implemented to create changes to the organisation. A difficulty with planned change is that employees often become aware of the cyclical nature of the change projects, and can become cynical and resistant.

Figure 2.1: Present and Future Organisations
Emergent change is contingent on other changes taking place in the environment and recognises that change is an open-ended process.

It involves an open management style, and larger empowerment of individuals in taking the decisions necessary for change. It also recognises the need for experimentation and adaptation to change.

For example, this approach recognises that projects start and are completed on a continuous basis and that individuals need to be capable of adapting to a changing environment and defining new goals at any time during a particular period. A difficulty with the emergent approach is that individuals sometimes lose the urgency to create change.

Both approaches — planned and emergent — have advantages and disadvantages. A hybrid approach to change adopts the better features of both. Planned change can be useful for creating the annual sense of urgency, whereas the open management style approach of the emergent approach can empower individuals to make suggestions for change as the need arises.

Section 2.4
Resistance to Change

Change in any organisation can be visualised as an iceberg with only 10% of change being visible to the eye (i.e. above the waterline). The visible things that change include physical resources, processes, technology, materials, organisational structure and so on. Things which need to be changed but are invisible to the eye make up 90% of the changes necessary in the organisation.

Invisible things (i.e. things below the waterline) include politics, culture, fears, personal schemas and resistance. Invisible things require most effort.

Often a change programme is measured by the visible things, when in fact little or no change has taken place with the invisible things. The iceberg metaphor is a powerful reminder that most changes are invisible to the eye. Let’s explore two of these invisible things a little closer – personal schemas and resistance to change.

Things which need to be changed but are invisible to the eye make up the majority of the changes necessary in the organisation.

Personal Schemas: Each individual sees the world differently. The difference depends on many factors including skills level, experience and personality. The classic example of personal schemas is that of a builder, a farmer and an archaeologist gazing into a field. Each sees something different. The builder
sees a foundation for a house, the farmer sees grazing for cattle and the archaeologist sees clues from a bygone civilization. All three are correct for their particular perspective. In managing change it is often necessary to allow individuals the time to see things from each other’s perspectives, otherwise meetings and tasks can become difficult and time-consuming.

A popular technique for lowering the barriers created by personal schemas is role reversal, where individuals are encouraged to change roles during a discussion.

Learning Activity 2.1
Write notes on what you find.
Add to your portfolio.

Resistance to Change: Resistance to change is common in all organisations. Often that resistance is unconscious to the individuals involved i.e. they are unaware that they are resisting change through their actions. There are a number of ways that change can be resisted and blocked:

- **Raising the level of abstraction** involves making a task or decision more complicated than it actually is i.e. discussing a topic for longer than is necessary before taking a decision.

- **Lowering the level of abstraction** is the opposite i.e. making a task or decision more simple than it actually is i.e. having very little discussion before taking a decision.

- **Requesting more information** when perhaps it is not necessary for taking a particular decision.

- **Referring to similar failures in the past** e.g. we tried this in the past and it didn’t work.

- **Appealing to procedure** i.e. stating that something cannot be done because it may not be allowed.

- **Lying low** and saying nothing when in fact your suggestions or criticisms are important.

- **Creating more work for the enthusiasts**, i.e. suggesting that anyone who appears to be enthusiastic should do more.

Each of these approaches is more often carried out subconsciously by the individual and leads to a particular task or decision being slowed down or terminated. It is important to determine when such behaviour is useful and proper and when it is simply causing a resistance to change. We can start by examining our own reasons for taking a particular approach to change.
Learning Activity 2.2
Identify a particular change in your own organisation which management aimed to introduce in the past year.
What was the change?
What was the reason for it?
What was the intended gain for the organisation?
How was the change implemented?
How did employees respond? Did anyone use particular change resistance activities from the list above? Explain how, and what impact this had.
Analyse your own approach to this change in light of the resistance list.
Add to your portfolio.

Section 2.5
Techniques of Change

Over the years, a number of techniques have emerged for helping organisations manage change. Some of these, such as ‘Organisational Design’ and ‘Project Management’, have attempted to help the whole organisation while others, such as ‘Total Quality Management’ and ‘Six Sigma’, have focused on one particular aspect of change. Figure 2.2 illustrates a small sample of the techniques that have emerged for managing various aspects of change in organisations (Dooley and O’Sullivan 2001).

Total Quality Management and Lean Manufacturing are common techniques of change.

Figure 2.2: Change Management Techniques

Many of the techniques come from a family of similar techniques. For example, in the management field, techniques such as ‘strategic planning’, ‘performance measurement’ and more recently ‘technology management’ have become popular in industry and academia.
On the other hand, the field of systems theory has developed a number of change management techniques such as 'structured analyses' and 'business process reengineering'.

All of these techniques have one thing in common — they help organisations to manage change.

Some analysts argue that as the various techniques become more familiar across the disciplines, they begin to coalesce and converge towards a smaller number of holistic techniques that adopt the best features of earlier techniques.

Innovation management, as presented in this module, is one such composite technique that builds on techniques such as 'strategic planning', 'performance measurement', 'project management', 'innovation management' and even 'knowledge management'.

Let's briefly review each of these now by way of general introduction. They will each be covered in more detail later in the module.

**Strategic Planning:** This technique has been around for many decades and involves organisations setting out the broad areas for change over a planning period. These areas for change are referred to as strategies or objectives and are aimed at guiding individuals in the development of ideas and projects that achieve the objectives.

**Performance Measurement:** This technique involves putting measures or indicators on certain critical aspects of an organisation's performance. The term measurement is key. Performance indicators must be easily measurable. Indicators are typically used to encourage and foster change in the organisation i.e. if a particular indicator is showing poor performance, then action needs to be taken to remedy the situation.

**Innovation Management:** This technique is often focused around the area of generating ideas and solving problems. As we shall see later, generating ideas cannot occur in isolation to understanding the goals of an organisation and these goals are typically communicated through objectives and indicators of performance.

**Learning Activity 2.3**

Search Online: http://www.google.ie/ for 'Hammer and Champy'
Write notes on what you find.

**Project Management:** This technique focuses on the need to manage various change projects and tasks effectively. It involves a disciplined approach to dividing projects into tasks and scheduling these tasks according to resource availability. An important discipline within this technique is portfolio
management where groups or projects are managed relative to one another. As with innovation management, this technique is heavily dependent on understanding the goals of the organisation.

**Knowledge Management:** This is a relatively new technique for change management and focuses on how to effectively manage change by managing the information associated with change. In this module, for example, innovation will be put into practice by using a knowledge management system for managing all of the key information involved in the innovation process.

**Section 2.6**  
**Change Methodology**

There are a broad variety of methods that organisations can use to create change. Methodologies are an important step-by-step approach to achieving an end goal. One method of note has been promoted by Kotter (1996). His method outlines eight steps.

Kotter’s steps for achieving change:

- Establishing a sense of urgency
- Forming a powerful guiding coalition
- Creating a vision
- Communicating the vision
- Removing obstacles for acting on the vision
- Planning for and creating short-term wins
- Consolidating improvements
- Institutionalising new approaches

**Establishing urgency** involves looking hard at the organisation’s competitive position, communicating this information broadly and dramatically, motivating staff and employees, looking for leaders and champions of change, and discussing unpleasant facts openly.

**Forming a coalition** involves developing a strong bond and loyalty between managers and the company.

**Creating a vision** involves developing a mental image of a possible and desirable future state that is realistic, credible and attractive, and that most individuals can buy in to.

**Communicating the vision** involves winning the hearts and minds of individuals. All existing and many new communication channels should be used, and clearly, behaviour must match words.
Removing obstacles hints at identifying much of the resistance outlined previously as early as possible.

Creating and achieving short term wins is necessary for boosting morale and convincing everyone that overall success is possible.

Consolidating improvements involves making sure that change sticks and that things don’t return to the old norms.

Finally, institutionalising new approaches involves making sure that the entire change programme leads to lasting change within the organisation.

**Learning Activity 2.4**
Identify a change which your organisation wished to introduce in the last two years, but which was not completely successful.

Analyse the management of this change in terms of Kotter’s eight steps. For each step, discuss how your organisation implemented this step, what worked and what did not, and why.

Identify some of the ways that change was resisted in your organisation.

Suggest ways that each step could have been improved to ensure a better outcome.

**Section 2.7**
**Case Study**

SwitchIt Ltd. has a number of competitors. The innovation team at SwitchIt keep a careful eye on competitors for new products, new marketing drives, pricing strategies and new services. The innovation team also keep an eye on other organisations that they can benchmark against. One such company produces electrical appliances such as toasters. SwitchIt’s main interest in these companies is how they manage their manufacturing processes. The innovation team gathers information from publications and also from non-competitive site visits where information can be shared between organisations.

**Section 2.8**
**Unit Review**

Innovation is about making changes.

The terms innovation and change are often used interchangeably: innovation is always positive, but change can sometimes be negative.

Change is the process of converting an organisation from its current state to some future desired state.
Change can be **planned** or **emergent**.

- **Planned change** is a formal process of transforming the organisation from one state to another.
- **Emergent change** is contingent on other changes taking place in the environment and recognises that change is an open-ended process.

Things which need to be changed but are invisible to the eye make up the majority of the changes necessary in the organisation. These invisible aspects include politics, culture, fears, personal schemas and resistance. Invisible things require most effort to change.

One barrier to change is personal schemas — individual ways of looking at things which are largely unconscious, and therefore difficult to change.

A popular technique for lowering the barriers created by personal schemas is **role reversal**, where individuals are encouraged to change roles during a discussion.

**Change management** is a broad discipline that can incorporate many associated techniques such as project management and knowledge management. These techniques have one thing in common — they promote and facilitate change in the organisation.

Many techniques are now merging to form a hybrid approach to innovation in any organisation incorporating, for example, strategic planning, performance measurement, project management, project portfolio planning and knowledge management.

Kotter's approach to change management involves eight steps:

- Establishing a sense of urgency
- Forming a powerful guiding coalition
- Creating a vision
- Communicating the vision
- Removing obstacles for acting on the vision
- Planning for and creating short-term wins
- Consolidating improvements
- Institutionalising new approaches

Innovation and change are two sides of the same coin.
Section 2.9
Self-Assessment Questions

1. Describe the difference between planned and emergent change.

2. What is the relationship between innovation management and change management?

3. How would techniques such as materials requirements planning and lean manufacturing relate to the concept of change management?

4. Kotter describes one of his steps as 'removing obstacles'. List the types of obstacles he may be referring to.
Section 2.10
Answers to Self-Assessment Questions

1. Planned change typically involves an annual programme that is handed down to individuals in the anticipation that they will act in creating change that meets the objectives of the programme. Emergent change involves engaging individuals in determining the goals of the organisation and then proposing and implementing solutions as they arise. Both approaches have advantages and disadvantages. The advantages of both can be merged.

2. Innovation management and change management are essentially the same. In the literature, innovation management typically focuses on idea generation and problem solving, but this cannot happen in isolation to goal definition. Change management in the literature typically focuses around psychology, but this is not a rule. Many analysts use the terms interchangeably while others adopt a particular term because of their background i.e. engineers typically talk about ‘innovation’ whereas business administrators prefer to talk about ‘change’.

3. Materials requirements planning (MRP) is a technique for planning and scheduling materials in an organisation. It is an ‘operational’ as opposed to ‘change’ technique. MRP is not related to change, although materials planning can of course be the subject of change. Lean Manufacturing is a technique concerned with reducing waste and as such it is a ‘change’ technique. It is concerned with changing, say, a ‘fat’ process into a ‘lean’ process.

4. Kotter is referring to obstacles principally in people’s minds such as the various types of resistance to change mentioned earlier. These include:

   1. Raising the level of abstraction
   2. Lowering the level of abstraction
   3. Requesting more information
   4. Referring to similar failures in the past
   5. Appealing to procedure
   6. Lying low
   7. Creating more work for the enthusiasts
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Section 3.1
Unit Introduction

Every organisation invests in innovation. Organisations put aside a proportion of turnover to make changes to their products, processes and services. There are particular reasons or objectives that should be achieved as a result of this investment.

However research has shown that a very large percentage of innovations fail to meet these objectives. The reasons behind failure give us clues on how to avoid failure in the future.

This unit looks at investments that organisations make in innovation and the goals they most frequently want to achieve. It then looks at the reasons why many innovations fail to achieve their goals.

Section 3.2
Unit Learning Objectives

When you have successfully completed this unit you will be able to:

• Discuss why organisations invest in innovation
• Discuss the amount of investment that organisations make
• Explain why organisations make these investments i.e. their goals
• Give reasons why most innovation fails
• List the five main areas that organisations need to address in order to improve innovation

Section 3.3
Investment in Innovation

Each year, organisations spend a significant amount of turnover on innovation i.e. making changes to their established products, processes and services. The amount of investment can vary from as low as a half a percent of turnover for organisations with a low rate of change, to anything over twenty percent of turnover for organisations with a high rate of change. This will depend on whether the organisation is a cash cow, shooting star, a dog or a question mark in terms of it growth-share status (see Figure 3.1, BCG Matrix). Cash cows are organisations that have low market growth potential and high relative market share. Shooting stars, on the other hand, have a high market growth potential and high relative market share. Organisations with low relative market share and low market growth rate may receive very little investment.
Each year established organisations spend an average of 4% of turnover on innovation.

The average investment across all types of organisations is four percent. For an organisation with a turnover of, say, one billion euros, this represents an investment of forty million euros. This budget will typically be spread across various functions including marketing, product design, information systems, manufacturing systems and quality assurance.

![BCG Matrix](image)

**Figure 3.1: BCG Matrix**

The principal goals required in return for this investment vary between organisations. The following have been found across a large number of manufacturing and services organisations and are ranked in order of popularity, with the first goal being common to most organisations and so on:

1. Improved quality
2. Creation of new markets
3. Extension of the product range
4. Reduced labour costs
5. Improved production processes
6. Reduced materials
7. Reduce environmental damage
8. Replacement of products/services
9. Reduced energy consumption
10. Conformance to regulations
These goals vary between improvements to products, processes and services and dispel a popular myth that innovation deals mainly with new product development.

Most of the goals could apply to any organisation, be it a manufacturing facility, marketing firm, hospital or local government. None of the goals suggest any particular solution or technology e.g. computer technology. Technology, for example, may be a means to a goal, but is not the goal in itself.

Section 3.4
Failure of Innovation

There are clearly other goals for innovation within particular organisations that will vary from the list given. Attaining goals is the ultimate objective of the innovation process. Unfortunately, most innovation fails to meet organisational goals. Figures vary considerably depending on the research. Some research quotes failure rates of fifty percent, while other research indicates that as high as ninety percent of innovation has no impact on organisational goals.

From another perspective, a survey regarding product innovation indicates that out of three thousand ideas only one will become a success in the marketplace.

Failure is an inevitable part of the innovation process and most successful organisations factor in an appropriate level of risk.

Perhaps it is because all organisations experience failure that many organisations choose not to monitor the level of failure very closely. The impact of failure goes beyond the simple loss of investment. Failure can also lead to loss of morale among employees and an increase in cynicism and even higher resistance to change in the future.

Failing early allows focus to turn to new ideas quicker.

Innovations that fail are often potentially ‘good’ ideas but have been rejected or ‘shelved’ due to budgetary constraints, lack of skills or poor fit with current goals. Likely failures should not necessarily be eradicated but rather identified and screened out as early in the process as possible. Early screening avoids unsuitable ideas devouring scarce resources that are needed to progress more beneficial ones. Organisations can learn more about failure when it is openly discussed and debated. Lessons learned from failure often reside longer in the organisational consciousness than lessons learned from success. While learning is important, high failure rates throughout the innovation process are wasteful and a threat to the organisation’s future.
The causes of failure have been widely researched and can vary considerably. Some causes will be external to the organisation and outside its influence of control. Others will be internal and ultimately within the control of the organisation.

Internal causes of failure can be divided into causes associated with the cultural infrastructure and causes associated with the innovation process.

Failure in the cultural infrastructure varies between organisations, but the following are common across all organisations at some stages in their lifecycle (O’Sullivan 2002):

- Poor Leadership
- Poor Organisation
- Poor Communication
- Poor Empowerment
- Poor Knowledge Management

Learning Activity 3.1
Search Online for the following PDF document. Use the following key words in the search box: ‘PDF Science, technology and innovation in Europe’
Make notes to add to your portfolio.

Common causes of failure in the innovation process in most organisations can be distilled into five types:

- Poor goal definition
- Poor alignment of actions to goals
- Poor participation in teams
- Poor monitoring of results
- Poor communication and access to information

Poor goal definition: goal definition, to be of use, requires that organisations state explicitly what their goals are in terms that everyone involved in the innovation process can understand. This often involves stating goals in a number of different ways.

Poor alignment of actions to goals: good alignment of actions to goals means linking explicit actions such as ideas and projects to specific goals. It also implies effective management of action portfolios or groups of projects.
Poor participation in teams refers to the behaviour of individuals and teams. Avoiding this problem involves the explicit allocation of responsibility to individuals. It also refers to the payment and rewards systems that link individuals to goals.

Poor monitoring of results: unless you monitor results, you will not know how you are doing. It is essential to monitor all goals, actions and teams involved in the innovation process.

Poor communication and access to information: it is vital to keep all key people in the loop, so that employees can see immediately the connection between their actions and the outcomes of a particular initiative. Good information allows timely response to any problems that arise, and can help avoid failure.

Section 3.5
High Impact Innovation

Every organisation would like to achieve a return on their investment for their innovation efforts. The causes of failure outlined above give us an indication of what areas most organisations need to improve to increase the impact of innovation. The five main areas are (O'Sullivan 2002):

- Better definition of Goals
- More effective alignment between Actions and goals
- Greater participation of individuals in Teams
- Better monitoring of Results
- Great communications and sense of Community

Goals: A goal is defined in the dictionary as ‘the objective of an effort’. There are a number of ways of defining goals. These include:

1. Statements such as the mission and vision statement
2. Requirements of stakeholders such as customers and shareholders; Objectives such as strategic plans
3. Standards such as ISO9000 and Safety Regulations
4. Indicators of performance such as output and profits
Learning Activity 3.2
Search Online for definitions of the term 'Mission'.
Make notes on your findings.
Add to portfolio.

Defining these goals is a key factor in creating high-impact innovation.

Goals are the objective of an effort. Actions are the expenditure of effort. Teams are the resources for an effort. Results are the outcome of an effort. Communities are individuals with a common purpose.

Actions: An action is defined in the dictionary as ‘the expenditure of effort’. Actions include such activities as:

1. Problem identification and solution
2. Idea generation
3. Managing projects
4. Managing project portfolios

A key issue is that actions are in some way aligned with the goals of the organisation e.g. ideas have goals and these goals are defined.

Teams: A team is the defined in the dictionary as ‘resources for an effort’. Teams are made up of individuals, and there are a number of issues related to greater participation by individuals in teams. These include:

1. Assigning responsibility
2. Building structure in teams
3. Improving participation by individuals
4. Linking the performance of individuals to organisational goals
5. Appraising performance of individuals

Results: The term ‘result’ is defined in the dictionary as ‘the outcome of an effort’. The principal results that an organisation needs to concern itself with are the results of:

1. Goals such as objectives and indicators
2. Actions such as completion rates of project tasks
3. Teams such as where individuals are participating and how their performance review is progressing
There are clearly many things going on at once, and organisations must learn to use techniques such as the ‘traffic lights’ system that allow them focus on critical activities. Organisations also need to learn about meeting management goals and objectives.

**Communities:** The dictionary defines community as ‘individuals with a common purpose’. That common purpose is the goals of the organisation, but may also reflect the professional goals of the individuals in it. Building community is a time-consuming process and involves key issues such as:

1. Organisation and Leadership
2. Benchmarking
3. Communications
4. Knowledge Management

**Five ways to improve innovation: Goals, Actions, Teams, Results and Communities.**

**Section 3.6**

**Case Study**

The innovation plan at SwitchIt Ltd. was developed by a senior team chaired by the general manager (see Figure 3.2). This team initially met for one week off-site to generate the goals of the organisation. The team now meets weekly on Fridays for one hour to review the status of the company’s goals, and the status of various actions such as projects and new ideas. This meeting often focuses exclusively on ‘exceptions’ (i.e. activities that are showing a ‘red’ status signal). In addition to the members shown in the table below, other members of the company are invited to attend as required.

<table>
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**Figure 3.2: Individuals**
Section 3.7
Unit Review

Organisations spend on average just under 4% of turnover on innovation, trying to achieve goals such as the following:

Improved quality
Creation of new markets
Extension of the product range
Reduced labour costs
Improved production processes
Reduced materials
Reduce environmental damage
Replacement of products/services
Reduced energy consumption
Conformance to regulations

Most innovation fails to achieve these goals and some analysts argue that failure could be as high as 90%.

Failure is thus an inevitable part of the innovation process, and most successful organisations factor in an appropriate level of risk.

It is important to identify early projects likely to fail. Failing early allows focus to turn to new ideas quicker, and so avoids undue waste of resources.

Causes of failure can be internal or external. External causes are outside the control of the organisation.

The internal causes of failure are varied, but some causes are common across most organisations. These causes can be divided into cultural and process failures. Cultural failures such as poor leadership and organisation are clearly important, but take time to improve.

Common causes of failure in the innovation process in most organisations can be distilled into five types:

- Poor goal definition
- Poor alignment of actions to goals
- Poor participation in teams
- Poor monitoring of results
- Poor communication and access to information

Goals are the objective of an effort.
Actions are the expenditure of effort.
Teams are the resources for an effort.
Results are the outcome of an effort.
Communities are individuals with a common purpose.
Process failures such as poor definition of goals and failure to align actions with goals are also important, and can be remedied in the shorter term through better information and knowledge management.

**Section 3.8**

**Self-Assessment Questions**

1. Explain one rationale for the amount of turnover spent by organisations on innovation.

2. List some of the main reasons they invest in innovation.

3. What are main causes of failure in achieving innovation?

4. What are main issues to address in achieving better impact from innovation?
Section 3.9
Answers to Self-Assessment Questions

1  The BCG matrix classifies organisations regarding their relative market share and relative growth potential. Organisations that have a high market share and low growth potential may invest very little in innovation or making changes. Organisations with low market share and high growth potential may invest most if not all of turnover in innovation during the early start-up years.

2  Main reasons for investing in innovation:
   • Improved quality
   • Creation of new markets
   • Extension of the product range
   • Reduced labour costs
   • Improved production processes
   • Reduced materials
   • Reduce environmental damage
   • Replacement of products/services
   • Reduced energy consumption and
   • Conformance to regulations.

3  Main causes of failure of innovation:
   • Poor Leadership
   • Poor Organisation
   • Poor Communication
   • Poor Empowerment
   • Poor Knowledge Management

   Common causes of failure within the innovation process in most organisations can be distilled into five types:
   • Poor goal definition
   • Poor alignment of actions to goals
   • Poor participation in teams
   • Poor monitoring of results
   • Poor communication and access to information

4  Main issues to address to improve the impact of innovation:
   • Better goal definition
   • Better alignment of actions to goals
   • Better participation in teams
   • Better monitoring of results
   • Better communication and access to information
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Section 4.1
Unit Introduction

There are a number of cultural and process-related changes that organisations can make to improve the impact of innovation on achieving their goals. By understanding the process by which innovation takes place, and then improving and mastering that process, organisations can lower innovation failure rates and speed up the process of growth. This section begins by looking at the innovation lifecycle and in particular the s-curve which explains why all innovations come to an end of life and require new innovations to succeed them. We then look at the process of innovation from idea generation, through evaluation and on to realisation, where customers become the ultimate judge of how successful an innovation is. We conclude by looking at the innovation funnel which brings together five of the key ways to improve the impact of innovation in any organisation.

Mastering the innovation process can lower failure rates and speed up growth.

Section 4.2
Unit Learning Objectives

When you have successfully completed this unit you will be able to:

- Describe the innovation lifecycle and how all innovations come to an end of life
- Define the key stages in the innovation process
- Explain the process of managing innovation
- Explain the innovation funnel and the relationship between goals, actions, teams, results and community

Section 4.3
Innovation Lifecycle

The lifecycle of innovation for a product can be described using the 's-curve'. The s-curve maps growth against time.

In the early stage of a particular innovation, growth is relatively slow as the new product establishes itself. At some point, customers begin to demand the product and growth increases exponentially. Incremental innovations to the product allow growth to continue. Towards the end of its lifecycle, growth
slows and may even begin to decline. No amount of new investment will yield the same rate of return for the investment. The product becomes less and less attractive for the organisation.

Every product has an s-curve i.e. a start-up phase, a rapid increase in revenue and eventual decline.

Innovative companies will typically work continuously on new ideas that will eventually replace older innovations.

Figure 4.1 illustrates the s-curve for two products. The first shows the curve for a current technology. The second shows an emerging technology that will eventually overtake the current technology and lead to even greater levels of growth. The lifecycle of a product will depend on a number of factors including market maturing, competitive practice, regulations and so on.

Figure 4.1: The S-Curve for Innovation Lifecycles

Case: The tube television has had a life of almost 50 years. Analysts now agree that it is at the end of its life. In its latter years no amount of new investment could have kept its sales growing, or protect it from the emerging flat-screen television technology. On the other hand, when the flat-screen television first emerged, its costs were prohibitive for most customers and its growth rate was relatively slow. When costs did come down, it entered its exponential growth phase. It is unclear whether this will last another 50 years, and most commentators agree that the lifecycle of new technologies is getting shorter with each new disruptive technology.
Learning Activity 4.1
Search Online: http://www.ted.com for a lecture from leading scientists on new technologies.
Make notes on your findings.
Add to your portfolio.

Section 4.4
Process of Innovation

The first stage in innovation is for someone to generate an idea. It is typically a technical insight into a product or process, or a thought about a service. In some cases, ideas arise from observed problems that have either occurred in the past or may occur in the future. Ideas can also be stimulated by the goals of the organisation or an unanticipated opportunity. Various stimuli can lead to the generation of an idea, from reading magazines and observing problems, to visiting other organisations and having informal discussions with colleagues.

Innovation can begin with a goal, an idea or a problem.

Idea generation leads to opportunity recognition, where someone can see an opportunity for developing the idea into a new product, process or service, see Figure 4.2.

Figure 4.2: Innovation Process

The opportunity recognition stage involves an idea evaluation stage where ideas are tested. Often ideas are improved, merged with other ideas and in many cases abandoned.

An important test for an idea is that it matches the goals of the organisation and available resources — people and money.
If an opportunity is recognised, then the idea moves to a new stage where it can be developed further. The development phase may involve prototype development and market testing. Many ideas wait at the end of the development phase for market conditions to be right. There are currently many new products languishing in the laboratories of Philips and Nokia waiting for their moment to begin disrupting existing technology.

The final stage of the innovation process is realisation and in many cases exploitation, where the customer makes the final evaluation.

Section 4.5
Methodology of Innovation

Innovation management results in a plan that contains goals and a set of actions aimed at achieving goals. Developing an innovation plan requires a proven approach or methodology.

A methodology is a systematic or clearly defined way of accomplishing an end.

Methodologies often present themselves as a set of steps that need to be implemented, with each step containing inputs from previous steps and outputs to subsequent steps. Large organisations typically adopt or develop their own methodology that reflects the culture, skills and experience of the employees. Highly-skilled individuals can develop their own methodology as they progress through the plan. They use a ‘clean sheet’ approach, relying on their own intuition and experience to determine what steps to take.

Each organisation should attempt to either adopt or develop its own methodology before embarking on the creation of an innovation plan.

The process of managing innovation presented in this module can be represented by a methodology that contains five steps. These steps (see Figure 4.3) are (O'Sullivan 2002):

- Understand requirements and define goals
- Engage users and model processes
- Create actions and empower teams
- Develop migration plan
- Implement actions and monitor results
Step 1: Understand requirements and define goals
The first step is to understand the requirements of the organisation's various stakeholders. When these requirements have been gathered, the process of defining goals can begin. These goals include strategic objectives and performance indicators and are used as inputs to all of the stages which follow. Other inputs into this first stage include discovering the status of current systems, and state of the art and best practice in other organisations.

Step 2: Engage users and model processes
The second step involves engaging various providers and users of the products, processes and services in problem identification and idea generation. Idea generation is informed by the goals defined in Step 1. This step also involves creating models which help the users to understand how the products, processes and services work. Simple models such as flowcharts and activity models allow users to visualise how the process currently works and how it may work in the future. Other inputs to this step include the results of any benchmarking carried out.

Step 3: Create actions and empower teams
This step involves selecting and converting ideas into projects, and selecting teams to execute these projects. This step is also informed by the innovation goals of the organisation. Other inputs to this step include existing actions currently being carried out by the organisation. The various actions and their associated teams are inputs to the next step.

Step 4: Develop migration plan
This fourth step brings together all of the goals, actions and teams from the previous three steps. Together they form a migration or innovation plan. This plan is dynamic and changes as goals change and as actions are implemented. This plan can be a paper document implemented using word processing, spreadsheets and graphics. In many organisations, information technology is more likely to be a knowledge management system.

Step 5: Implement actions and monitor results
The final step represents the activity of implementing the various actions over a period of time, and monitoring the results of goals, actions and teams. The
output of this final step becomes feedback to the first step, where results are used to define and redefine goals.

This five-step methodology is executed in different time periods. Step 1 is typically executed over one to two weeks at the beginning of each planning period. The planning period may be between one to five years. Step 2 is executed on a number of occasions throughout the period of the plan — perhaps five or six times. Step 3 occurs more frequently as new actions are defined — perhaps once a month. Step 4 occurs frequently. The plan is dynamic and changes on a weekly basis as goals, actions and teams change. Step 5 occurs daily. Each day, projects are progressed further and the performance results of the various outputs of the organisation are continuously monitored.

Methodologies contain stages where each stage is linked through inputs and outputs.

Section 4.6
Innovation Funnel

The innovation funnel provides a solution for explicitly defining the information requirements for managing goals, actions, teams and results used in the innovation process.

The funnel illustrates how goals, actions, teams and results interact with each other to create change in any organisation — see Figure 4.4. The innovation funnel can be visualised as containing four arrows flowing around a funnel.

Each arrow in the innovation funnel represents the flow of goals, actions, teams and results.

Actions enter the wide mouth of the funnel and represent, among other things, alternative ideas for change. These actions flow towards the neck of the funnel where many will be eliminated. The neck of the funnel is constrained by two arrows — goals and teams. These constraints loosen or tighten, depending on the availability of teams and definition of the goals. Tightly-defined goals can be visualised as closing the neck of the funnel with the change of fewer ideas flowing through. The availability of more teams, on the other hand, can be visualised as opening the neck of the funnel and allowing more ideas to be worked on.

The final arrow, results, flows from the narrow end of the funnel and represents information concerning the results of execution of goals, actions and teams. This arrow flows back towards goals, representing the impact of results on the process of defining and redefining goals.
Ideas, for example, that cannot easily be associated with goals will find it difficult to proceed into the funnel. This has two effects:

(i) The individuals or teams generating the ideas will study the goals more closely in order to generate an idea that matches better.

(ii) Good ideas which are not easily associated with goals will begin to impact on the definition of the goals. This will ultimately lead to a redefinition of goals in order to allow the good ideas through. This is a natural learning process within an innovation community.

The innovation funnel highlights the need for relationships between goals, actions, teams and results

When goals change there is a knock-on effect in the generation of ideas that meet these goals, because the innovation community is now tuned to having new ideas to meet organisational goals. The process offers the innovation community the ability to change the innovation process in response to changing demands of stakeholders.

**Section 4.7 Case Study**

The mission of SwitchIt is the 'Efficient manufacture of innovatively produced switchgear solutions.' SwitchIt is focused on manufacturing switchgear at low cost, high productivity and high quality. They are also focused on continuously improving their manufacturing processes. The main contribution to operating revenue and profit is through lowering overall total cost of production.

The innovation funnel offers organisations a structured approach to managing innovation that reduces the effects of the main cause of failure, while simultaneously achieving goal attainment. The rewards for adopting such a simple, yet effective, system can be significant not only in terms of more cost-
benefits, but more importantly in terms of morale and skills development among participants in the innovation process. Reducing failure by just fifty percent provides potential savings of twenty million euros annually for a one billion turnover company. The benefits from goal attainment mirror the common goals mentioned earlier — improved quality, better productivity, better product ranges and so on.

Learning Activity 4.2
Search Online using the keywords 'development funnel', 'innovation funnel' and 'ideas funnel'
Make notes on your findings for each topic.
Add to your portfolio.

Section 4.8
Unit Review

Mastering the innovation process can reduce failure rates and speed up growth.

The lifecycle of innovation for a product can be described using the 's-curve' which maps growth against time. Every product has an s-curve i.e. a start-up phase, a rapid increase in revenue and eventual decline.

Innovative companies will typically work continuously on new ideas that will eventually replace older innovations.

Innovation can begin with a goal, an idea or a problem.

An important test for an idea is that it matches the goals of the organisation and available resources — people and money.

To be innovative, an organisation needs to develop an innovation methodology. A methodology is a systematic or clearly-defined way of accomplishing an end.

Each organisation should attempt to either adopt or develop its own methodology before embarking on the creation of an innovation plan.

This unit presents a five-step process for managing innovation:

- Understand requirements and define goals
- Engage users and model processes
- Create actions and empower teams
- Develop migration plan
- Implement actions and monitor results
Methodologies contain stages where each stage is linked through inputs and outputs.

Finally, the unit presented a model of the innovation funnel.

Each arrow in the innovation funnel represents the flow of goals, actions, teams and results.

The innovation funnel highlights the need for relationships between goals, actions, teams and results.

**Section 4.9**

**Self-Assessment Questions**

1. Explain the S-Curve used to describe the lifecycle of an innovation.
2. What are the key stages in the innovation process?
3. Suggest a methodology for managing innovation.
4. Explain the innovation funnel.
Section 4.10
Answers to Self-Assessment Questions

1 The S-Curve illustrates how at first an innovation contributes very little growth (revenue and efficiency) to an organisation. As the innovation is adopted, there is an exponential increase in the impact on organisational growth for a period of time. Eventually, the impact on growth diminishes and users of the innovation are vulnerable to new innovations used by their competitors that will produce even higher levels of growth. Organisations must invest in their own new innovations which will be able to replace existing ones in due course.

2 The key stages in innovation are:

(i) idea generation
(ii) opportunity recognition
(iii) development and realisation

Opportunity recognition is influenced by the goals of the organisation and the availability of resources to work on the innovation.

3 Steps in the process of managing innovation:

Understand requirements and define goals
Engage users and model processes
Create actions and empower teams
Develop migration plan
Implement actions and monitor results

4 The innovation funnel is a metaphor for the way innovation works in any organisation. It can be visualised as including four arrows flowing around the funnel. Each arrow represents the flow of goals, actions, teams and results. Actions enter the wide mouth of the funnel and represent, among other things, alternative ideas for change. These actions flow towards the neck of the funnel where many will be eliminated. The neck of the funnel is constrained by two arrows — goals and teams. These constraints loosen or tighten depending on the availability of teams and definition of the goals. The final arrow, results, flows from the narrow end of the funnel and represents information concerning the results of goals, actions and teams. This arrow flows back towards goals, representing the impact of results on the process of defining and redefining goals.
Defining Goals

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Defining Goals

Section 5.1
Unit Introduction

Every organisation has its own way or method of defining goals. In this module we will look at four main types of goals. These goals are labelled statements, requirements, objectives and indicators. We also look at environment analysis that informs the goal definition process using techniques such as benchmarking, checklists and SWOT. We conclude this unit by looking at the data structure of statements. The purpose of looking at data structure is to begin the process of building a knowledge management system for the management of innovation.

Organisations can have different methods of defining goals and different terms and definitions for goals.

Section 5.2
Unit Learning Objectives

When you have successfully completed the unit you will be able to:

- Describe the process of defining goals
- Use some tools for conducting environment analysis
- Explain the terms ‘mission statement’ and SWOT analysis’
- Begin building your own knowledge management system

Section 5.3
Goal Planning

Goal planning is now a common technique in most organisations. This was not always the case. In the past, goals resided in the minds of owners and senior executives who communicated them to subordinates through verbal instructions. Today's complex organisations require employees to understand and share common objectives, and engage in idea generation and execution. Few owners and managers now have the ability to set goals for an organisation, and simultaneously generate and manage the actions required for change.

The principal approach to goal planning is to define high-level goals for change and innovation within the organisation.
These goals then guide individuals and teams in generating ideas, actions and projects. The goals of the organisation inform the imagination of individuals and set indicators of performance that projects need to achieve.

Goals inform the imaginations of individuals and assist them in creating ideas that can help achieve them.

Goals are general because they typically guide change for between one and five years into the future. They are also general because they need to leave room for individuals to make their own decisions when making specific proposals for ideas. It is typical to see a planning period appended to the title of innovation plans e.g. ‘ABC Corp Strategic Goals 2007-2009’.

Various terms are interchangeable with the term goals, for example ‘strategic plan’, ‘development plan’, ‘innovation plan’ or ‘team objectives’.

There are a number of approaches to developing goals for any organisation. One approach is illustrated in Figure 5.1. The key activities are:

(i) Statements
(ii) Stakeholder requirements
(iii) Strategic objectives
(iv) Performance indicators

Figure 5.1: Goal Planning Process
Statements: Typical statements include mission and vision statements. Statements are high-level goals that inform individuals in the organisation and their customers about what the organisation is doing or aims to do in the future. Mission statements are informed by the philosophy, history, core values and core competencies of the organisation. Statements in turn inform the process of generating strategic objectives. There is more on statements later in this section.

Requirements: There are various stakeholders for an organisation. Stakeholders can be seen as the 'customers' in the broadest sense of the term. A key stage in setting goals is identifying who the stakeholders are and what it is that they require from the organisation. Their requirements inform the strategic objectives of the organisation.

Objectives: Strategic objectives are a more detailed list of goals typically divided into strategic thrusts. The development of strategic objectives is informed by stakeholder requirements. It is also informed by emergent strategies being adopted by industry in general e.g. 'Develop more eBusiness opportunities'. The process of generating strategic objectives is also informed by environmental analysis, benchmarking and various check lists. Strategic objectives in turn inform the development of performance indicators.

Indicators: Performance indicators are measurable targets of performance. They are linked with the strategic objectives in that each strategic objective should be measurable directly or indirectly. The selection of performance indicators is informed by such activities as benchmarking and environment analysis. Indicators in turn inform the actions that need to be generated, managed and executed in order to make changes to the organisation.

Learning Activity 5.1
There are various approaches to goal planning (sometimes called strategic planning or performance measurement). Identify two other approaches to goal planning in the literature and compare and contrast with the approach adopted in this course. Add to your portfolio.

Actions: Indicators and Objectives inform the process of generating ideas for change and innovation, which in their turn are converted into projects for implementation. Actions when fully executed make physical change happen, and when this change is positive, help the organisation reach its performance indicators.
It is now accepted that all organisations including banks, churches, hospitals, local governments and so on need to adopt a formal goal-definition process.

Each of the above goal definition activities contributes to creating positive innovation.

Goals are typically developed at the beginning of a time-period of between one and five years.

They can also be edited and improved periodically within this period. Actions, on the other hand, are being generated, managed and completed on a continuous basis through the goal-definition period. In the beginning, actions from previous planning periods are all that exist, and as resources are released and new ideas are being generated, new actions are formally adopted. At the end of the planning period, some actions will remain to be executed, and these are often continued in the new planning period.

The results of all activities, goals and actions are monitored continuously throughout this period.

Results monitoring not only informs the organisation of how it is progressing, but also helps with the process of editing and fine tuning goals and actions. This is a learning activity that perfects the goal planning process.
Section 5.4
Environment Analysis and Benchmarking

Environment analysis involves taking time to analyse the internal and external environment of the organisation. In large organisations, consultants and special corporate teams can be used to facilitate this process. There are many different types of tools used to carry out the analysis. One popular tool for environment analysis is a checklist. Checklists vary considerably from industry to industry and depend on the task in question. One type of checklist is shown in Figure 5.2.

<table>
<thead>
<tr>
<th>Financial:</th>
<th>Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Return on Equity</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>Economic Value Added</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>Sales per Employee</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>Operating Cash Flow</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>Production:</td>
<td>Ranking</td>
</tr>
<tr>
<td>Capacity Used</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>Labor Used</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>Material Used</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>Quality Control Rate</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>Organization:</td>
<td>Ranking</td>
</tr>
<tr>
<td>Staff to Manager Ratio</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>Turnover Rate</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>Productivity Index</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>Development per Employee</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>Marketing:</td>
<td>Ranking</td>
</tr>
<tr>
<td>Market Share</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>Advertising</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>Customer Retention Rate</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>Technology:</td>
<td>Ranking</td>
</tr>
<tr>
<td>Current Capabilities</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>Time to Respond Rates</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>Ability to meet implementation targets</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>Competition:</td>
<td>Ranking</td>
</tr>
<tr>
<td>Cost Comparisons</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>Quality Comparisons</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>Market Comparisons</td>
<td>1 2 3 4 5</td>
</tr>
</tbody>
</table>

Figure 5.2: Sample Environment Analysis Check List

This checklist has been divided into six areas which look at issues around finance, production, organisation, marketing, technology and competition. In production, for example, the key criteria used are capacity usage, labour usage, material usage and quality control. Checklists allow users to indicate a ranking for each of the criteria. The criteria for creating checklists are found in the body of knowledge associated with the organisation (e.g. books, consultants, research papers etc.).
Learning Activity 5.2
Does your organisation use a checklist/checklists for assessing performance?
Find out about these and write some notes on their usefulness for your future reference.
Add to your portfolio.

Benchmarking is powerful technique for generating ideas for new goals.

Benchmarking is the process of evaluating aspects of business processes in relation to best practice elsewhere. It typically involves visiting other organisations such as competitors, similar organisations and leading organisations renowned for excellence in one or more of their processes. Competitive benchmarking involves looking at competitors' products, processes and services to see the types of features that can add value to customers. Collaborative benchmarking involves non-competitive organisations comparing and contrasting their processes with each other.

The output of a particular benchmarking exercise is a list of requirements that inform goal planning and idea generation.

Section 5.5
SWOT Analysis

SWOT analysis is another popular technique used for environment analysis. The SWOT technique identifies the strengths, weaknesses, threats and opportunities of the organisation.

The strengths of the organisation are those advantages that distinguish it from its competitors and they need to be maintained in the future. The weaknesses are the things that need improvement. Threats are those things that may threaten the organisation in the future. Opportunities are those things that may offer advantages for the organisation in the future.

SWOT typically has internal and external perspectives. Employees and managers provide internal perspectives on the strengths and weaknesses of an organisation. Customers and other stakeholders can provide an external perspective.

Strengths are those things that help an organisation achieve its goals.
**Strengths:** To establish your organisation’s strengths, typical questions that may need to be asked include:

- What advantages does the organisation have?
- What does the organisation do better than anyone else?
- What unique resources does the organisation have access to?
- What do stakeholders identify as strengths?

Strengths need to be gauged in relation to stakeholders' expectations and the strengths of competitors. If stakeholders expect high quality and competitors deliver high quality, then having high quality is not a strength. *Examples of strengths:* Customer loyalty, reputation, cost leadership, skilled labour, location. Improving strengths keeps organisations ahead of their competitors in those specific areas.

**Weaknesses:** Typical questions that may need to be asked include:

- What needs to be improved?
- What needs to be avoided?
- What do stakeholders identify as weaknesses?

Unpleasant truths may need to be faced. Benchmarking may identify strengths in other organisations that may translate into weaknesses in your own.

*Examples of weaknesses:* poor management, no focus, untrained labour, obsolete processes and equipment.

Weakenesses are those things that hold an organisation back from achieving its goals.

**Opportunities:** External opportunities arise from such things as changes in technology, changes in government policy and regulations, changes in social behaviour of customers and new investments by stakeholders. A useful way to look for opportunities is to examine strengths and weaknesses in detail. Both strengths and weaknesses can provide new opportunities in the future. *Examples of opportunities:* failure of competitors, lower cost raw materials, expanding market.

**Threats:** Internal threats may come from employees, potentially unreliable technology or defective/obsolete processes. External threats may come from competitors and stakeholders, or changes in regulations which prove an insurmountable obstacle for an organisation. Identifying threats may put existing problems into perspective.

*Examples of threats:* entry of new competitors, poor supplier relations.
Section 5.6
Developing Statements

There are a number of statements that can be developed by an organisation (Shapiro 1998).

The more popular statements are: mission, vision, quality and safety.

Many departments and other teams within larger organisations typically adopt the mission of the larger organisation. This can be a mistake and can introduce ambiguity for members of the organisation. The mission of a computer services department, for example, may be something like providing computer services to its users. Adopting a higher-level mission statement such as ‘world leader in transport refrigeration’ may not inspire members of the computer services department. On the other hand, a mission statement such as ‘servicing the computing needs of users’ may have significance for members of the computer services department but little or no meaning for the larger organisation that provides transport refrigeration for a global customer base.

Mission is a statement of the organisation’s current purpose.

**Mission:** The mission statement should be a succinct representation of the organisation’s purpose or ‘reason for being’. It often incorporates meaningful and measurable criteria. The mission statement is a key consideration for any individual or stakeholder evaluating the strategic direction of the organisation. The statement can range from a very simple to a very complex set of ideas.

**Case:** Sample short mission statements from well-known organisations:

3M
‘To solve unsolved problems innovatively’

Mary Kay Cosmetics
‘To give unlimited opportunity to women.’

Merck
‘To preserve and improve human life.’

Wal-Mart
‘To give ordinary folk the chance to buy the same thing as rich people.’

Walt Disney
‘To make people happy.’
Below are two long versions of mission statements from two organisations – Studio67 and AMT:

**Studio67**

Studio67 is a great place to eat, combining an intriguing atmosphere with excellent, interesting food that is also very good for the people who eat there. We want fair profit for the owners, and a rewarding place to work for the employees.

**AMT**

AMT is built on the assumption that the management of information technology for business is like legal advice, accounting, graphic arts, and other bodies of knowledge, in that it is not inherently a do-it-yourself prospect. Smart business people who aren’t computer hobbyists need to find quality vendors of reliable hardware, software, service, and support. They need to use these quality vendors as they use their other professional service suppliers, as trusted allies. AMT is such a vendor. It serves its clients as a trusted ally, providing them with the loyalty of a business partner and the economics of an outside vendor. We make sure that our clients have what they need to run their businesses as well as possible, with maximum efficiency and reliability. Many of our information applications are mission critical, so we give our clients the assurance that we will be there when they need us.

**Learning Activity 5.3**

*What is the mission statement of your own organisation?*
*How does it impact on your department/work area?*
*What is the mission statement of your own department/work area?*
*How does it derive from the mission statement of the organisation?*
*If your area does not have a mission statement, write one, and justify why you have written it thus.*
*Add to your portfolio.*

**Learning Activity 5.4**

*Carry out a SWOT analysis of your own organisation.*
*Add to your portfolio.*

**Vision:** This is a statement of the future organisation that needs to be achieved. It is a graphic vision, typically in terms of performance indicators, of what the organisation wants to be at some point in the future. A vision of the future is something that is credible and realistic, but significantly better than what exists today.
Learning Activity 5.5
Search Online: http://www.ted.com for a lecture from Nicholas Negroponte on one of his visions for schools.

Learning Activity 5.6
Develop a new vision statement for your organisation, taking into account the current downturn in the global economy, global warming, and any specific weaknesses you found in your SWOT analysis.
Explain how that vision statement will impact on your own area. Take into account your earlier SWOT analysis in your answer.
Add to your portfolio.

Safety: This is a statement of the safety policy and practices of the organisation. Safety statements are now a legal requirement in many countries, including Ireland, to protect the health and safety of employees and customers.

Quality: This is a statement of the quality policy of the organisation, i.e. the goal of the organisation with respect to quality assurance and quality control of its products, processes and services. In some industries, for example medical devices, pharmaceutical, aerospace, manufacturers must comply with strict regulations which assure the quality of the product or device, and must therefore find expression in the organisation’s quality statement.

There are many other statements that can be defined for the organisation. For example, statements of core values, core competencies, critical success factors and so on.

Learning Activity 5.7
Find out about any additional statements of this type in your own organisation.
What use are they? How do they impact on employee behaviour? What is the advantage to the organisation?
Add your notes on these questions to your portfolio.

Section 5.7
Case Study

As part of the goal generation exercise, the SwitchIt innovation team has created a number of statements. These include statements of mission and core competencies but also of weaknesses and strengths. Figure 5.3 below illustrates a number of these statements, concentrating primarily on SWOT.
The principal weakness is the high rate of product returns through the warranty process due to process-related quality issues. A number of projects are currently underway to replace some old machines and improve operator training. One of the strengths noted at the beginning of the planning period was the plant’s status as a ‘world class manufacturing’ facility. It is currently felt by some managers that this status is under threat from recent results. ‘Increasing manufacturing costs’ was initially identified as a potential threat — with rising inflation this now appears to be becoming a reality. Finally, one of the opportunities identified at the beginning of the planning period was the availability of ‘University graduates’. Due to a number of factors, including high cost of living, this opportunity may be becoming a threat: lack of suitable graduates.

This look-back illustrates how fast change happens, and how volatile the trading situation has become. Organisations need to continually interrogate their performance, and avoid any hint of complacency.

Learning Activity 5.8
Draw up a list similar to the one in Figure 5.3 for your own organisation. Add to your portfolio.
Section 5.8
Unit Review

The process of defining goals requires organisations to consider creating statements with such as mission and vision statements, stakeholder requirements, strategic objectives and performance indicators. There are a number of tools with which can be used to inform such a process, including checklists, benchmarking, and SWOT analysis.

A statement such as mission statement is the first step in generating a comprehensive set of goals.

Organisations can have different methods of defining goals and different terms and definitions for goals.

The principal approach to goal planning is to define high-level goals for change and innovation within the organisation.

Goals inform the imaginations of individuals and assist them in creating ideas that can help achieve them.

It is now accepted that all organisations including banks, churches, hospitals, local governments and so on need to adopt a formal goal-definition process.

Goals are typically developed at the beginning of a time-period of between one and five years.

Results monitoring not only informs the organisation of how it is progressing, but also helps with the process of editing and fine-tuning goals and actions. This is a learning activity that perfects the goal-planning process.

Benchmarking is powerful technique for generating ideas for new goals.

The output of a particular benchmarking exercise is a list of requirements that inform goal planning and idea generation.

SWOT analysis is a widely-used exercise to establish the current competitive situation of the organisation.

Strengths are those things that help an organisation achieve its goals.

Weaknesses are those things that hold an organisation back from achieving its goals.

The more popular statements are: mission, vision, quality and safety.

Mission is a statement of the organisation's current purpose.
In this unit we began the process of building a knowledge management system by defining a small number of data fields required to build a statement (see Figure 5.3).

In the next unit we continue this process of designing a knowledge management system by looking at how to build a list of stakeholder requirements.

Section 5.9
Self-Assessment Questions

1. Outline in the process of defining goals for an organisation.

2. Explain the benchmarking process.

3. How does mission differ from vision?
Section 5.10
Answers to Self-Assessment Questions

1 There are many different processes for defining goals. The process outlined in this module discusses the creation of statements, requirements, objectives and indicators. These four types of goals inform the process of idea generation and project management.

2 There are two types of benchmarking. Competitive benchmarking involves comparing your organisation’s processes, products and services with those of your competitors. Collaborative benchmarking involves working with collaborative partners such as similar organisations, or best in class organisations, to make improvements to products, processes and services.

3 A mission statement is a statement of the current purpose of an organisation, ‘its reason for being’. A vision statement is a statement of the future state that the organisation wishes to achieve.
Section 6.1
Unit Introduction

Requirements are expressions of demand from the main stakeholders of the organisation. These stakeholders come mainly from outside the organisation. Common stakeholders in organisations include shareholders, customers, regulatory authorities and staff.

Stakeholders place requirements on the organisation to create change.

Stakeholder requirements are a core part of organisational goals. Shareholders, for example, will often demand more profit and lower costs. Customers will often demand better quality and faster response. Regulatory authorities will demand conformance to certain regulations (e.g. health and safety).

Identifying stakeholders is a key task in defining goals.

The organisation must firstly identify who the stakeholders are within its contextual and transactional environment, and then what it is they require.

Section 6.2
Unit Learning Objectives

When you have successfully completed the unit you will be able to:

- List eight types of stakeholders which organisations commonly have
- Outline three techniques for developing requirements: **objective data analysis**, **Delphi forecasting** and **quality function deployment (QFD)**
- Explain the terms ‘transactional’ and ‘contextual’ requirements
- Identify most of the key stakeholders in your organisation
- Develop a list of key requirements for each stakeholder
- Structure your stakeholder requirements for a knowledge management system

Section 6.3
Identifying Stakeholders

Stakeholders are the people and other organisations that have a stake in the operation and success of your organisation. They place demands and requirements on your organisation.
We naturally think of ‘shareholders’ as stakeholders in a profit-making organisation. Shareholders, for example typically require increased value (e.g. profits) for their continued engagement in the organisation.

**Customers** are another common stakeholder. Customers choose products, processes or services because they meet certain expectations. Continuing to meet these expectations means continuously listening to customers’ requirements such as ‘better value for money’ or perhaps ‘faster delivery times’.

There are other stakeholders that are less apparent.

**Regulators** of issues such as health and safety or waste emissions are also stakeholders in an organisation. They require that the organisation conforms to particular regulations and standards.

**Employees** are another important stakeholder group. Employees regularly issue requirements such as ‘increased job security’ or perhaps ‘better prospects of promotion’.

Stakeholders will vary across organisations. Identifying the organisation’s stakeholders is a key step in ‘Defining Innovation Goals’.

Nine types of stakeholder are common (Shapiro 1998) and are illustrated in Figure 6.1.

**Customers:** These stakeholders consume and use a particular product, process or service. They can be patients in a hospital, consumers of televisions or they can exist within a larger organisation. Doctors, for example can be customers of a hospital computer services department and managers can be customers of a quality department.

Customers are principal stakeholders and can include consumers, patients, students, and even colleagues within the same organisation

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**Learning Activity 6.1**


Make notes on what you learn.

Add to your portfolio.
Suppliers: These stakeholders are suppliers of products or services to the organisation. Like the other stakeholder groups, they may have requirements which may include maintaining a stable and effective supply chain. Typical supplier requirements include ‘payment on time’, ‘less bureaucracy when delivering goods’ and ‘need to receive more accurate information’.

Shareholders: These are individuals and other organisations who own a share in the organisation. For example a computer services department in a University is effectively owned by the senior management. They have requirements of the computer services department. Another example is an off-shore manufacturing plant who are effectively owed by corporate headquarters that typically require things such as ‘lower costs’ and so on.

Regulators: These are governmental and regulatory entities that have some degree of control or influence over the business. Most organisations need to conform to financial regulations, health and safety regulations and so on. Regulations can also include internal policies and standards developed inside the organisation.

Complementors: These are partners and other groups that add to the overall product, process or service, such as strategic partners, joint ownership partners and some key suppliers, distributors and customers.

Intermediaries: These are consultants, quasi-customers and other specialist groups that assist in product development and service provision.

Community: This is the local, regional and national community in which the organisation exists.
Learning Activity 6.2
Now identify the key stakeholders of your own organisation. List them by name under each heading (for example, names of consultant companies or individuals who supply specialist services to your company; names of suppliers etc. Add to your portfolio.

Section 6.4
Contextual and Transactional Requirements

Understanding who the organisation’s stakeholders are is a key step in defining innovation goals. The next task is to discover what it is that they require.

Stakeholders can have a transactional or contextual relationship with the organisation (Pava 1983).

A transactional relationship exists where the organisation can influence and change the stakeholder’s requirement in some way.

An example of a transactional relationship is where the organisation can change the expectation of, say, shareholders, by explaining that further investment is more desirable than reporting higher profits.

A contextual relationship exists where the organisation has no influence on the requirement.

An example of a contextual relationship is where the stakeholder insists on their demands being met. Corporate owners may, for example, insist on a particular cost-saving target or turnover in revenue. Government regulations are another example of a stakeholder with a contextual relationship.

Learning Activity 6.3
Mark the stakeholders from Activity 6.2 with a T or C, depending on whether they are transactional or contextual. For each set of stakeholders, write a short note on how their status as T or C affects the organisation's behaviour.
Section 6.5
Defining Requirements

Requirements are expressions of demand from each of the stakeholders. Some stakeholders may have many requirements while others may have only a few. Many requirements may need to be distilled and summarised into a few. There are many techniques used for defining requirements. One simple technique is to ask each stakeholder to articulate what they perceive the weaknesses and threats to the organisation are. These can be listed and grouped into a number of categories.

Requirements are expressions of demand from each of the stakeholders; they can be determined using a number of techniques. More structured techniques for gathering requirements include objective data analysis, Delphi forecasting and quality function deployment.

Objective Data Analysis: This is a technique where requirements are derived following the analysis of large amounts of data. Data such as historical sales, behaviour of machines and processes, previous performance measurements and so on are used to predict the system’s behaviour in the future. Predicted poor performance can be translated into requirements that will change the system into behaving better.

Delphi Forecasting: This is a subjective technique for predicting future requirements of stakeholders. It is based on human judgment rather than the analysis of data. The Delphi method replaces direct open debate (where one personality may dominate others) by a carefully designed program of interrogation. Three principal techniques are used:

1. anonymous interaction,
2. iteration with controlled feedback, and
3. statistical group response.

Quality Function Deployment: This is a systematic approach to translating requirements into relevant objectives and actions at each stage of the innovation process. A key technique used in quality function deployment is the ‘house of quality’ which uses a matrix to link requirements with other goals and actions.

Learning Activity 6.4
For more detailed information on these techniques you are encouraged to search the internet.
When wording the requirement, it is useful to use language expressed from the perspective of the stakeholder.

The customer, for example, would express a requirement something like 'deliver products faster' or 'provide more reliable products'. Put yourself in the position (or 'shoes') of the stakeholder and use the stakeholder's 'voice' to express the requirement. Putting an active verb in the description can also be useful e.g. 'deliver' and 'provide'.

Learning Activity 6.5
Add notes on each technique to your portfolio.
Which approach do you think would be most useful in your work context, and why?

Case: Clearview Pharmaceuticals is a small manufacturing company. The innovation team is responsible for mainly process innovations and includes key personnel from all of the main functions in the organisation — all managers and some specialists. They meet bi-monthly to discuss the progress of their goals and review the status of various projects. They also review any ideas which have been generated by employees that match organisation goals. The requirements of each stakeholder have been determined and are monitored regularly by specific members of the team (See Figure 6.2).

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Requirement</th>
<th>Responsible</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conformance</td>
<td>Continue to meet IWB / FDA Requirements</td>
<td>Mike Mannion</td>
</tr>
<tr>
<td></td>
<td>Gain ISO 14001 certification</td>
<td>Mike Mannion</td>
</tr>
<tr>
<td></td>
<td>Obtain ISO 9001 Quality System</td>
<td>Mike Mannion</td>
</tr>
<tr>
<td>Corporation</td>
<td>Increased Productivity</td>
<td>Mark Ryan</td>
</tr>
<tr>
<td></td>
<td>Communications</td>
<td>Mary Joyce</td>
</tr>
<tr>
<td></td>
<td>Develop IT infrastructure</td>
<td>Gary Smith</td>
</tr>
<tr>
<td>Customer</td>
<td>Reduce product costs</td>
<td>Andy Scott</td>
</tr>
<tr>
<td></td>
<td>Reduce manufacturing lead time</td>
<td>Mark Ryan</td>
</tr>
<tr>
<td></td>
<td>Better communications portal</td>
<td>Mary Joyce</td>
</tr>
<tr>
<td>Shareholder</td>
<td>Investment Maximization</td>
<td>Paul Jones</td>
</tr>
</tbody>
</table>

Figure 6.2: Clearview Pharmaceuticals' Stakeholder Requirements

A key requirement of customers is reducing manufacturing lead times. At each meeting, the Production Manager gives an update to the rest of the team on the status of this requirement. As new requirements are determined, they are added and allocated responsibility.
Use one of the techniques to identify the requirements of your organisation’s stakeholders.

SwitchIt Ltd. has a number of key stakeholders (see Figure 6.3). Preliminary requirements from these stakeholders are illustrated in the table below. One of the principal stakeholders is the parent company which is demanding a €300k cost improvement in the current year. Another key stakeholder set, Customers, are requiring improved lead times, greater quality and reliability of our products. They are also requiring greater flexibility in the event of order changes with less ‘red tape’ in changing order quantities and due dates.

<table>
<thead>
<tr>
<th>Requirements</th>
<th>Group</th>
<th>Title</th>
<th>Responsible</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parent</td>
<td>Improve Cost Structure (300k)</td>
<td>Mary Roche</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parent</td>
<td>Greater Utilisation of Assets</td>
<td>Dammy Mulryan</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parent</td>
<td>Pilot Corporate ERP System</td>
<td>Andrew Kelly</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Customers</td>
<td>Reduced Lead Times</td>
<td>Michael Clark</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Customers</td>
<td>Increased Flexibility</td>
<td>Michael Clark</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Customers</td>
<td>Greater Quality and Reliability</td>
<td>Stewart O’Neill</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employees</td>
<td>Opportunity to Learn on the Job</td>
<td>Gary O’Halleran</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employees</td>
<td>Greater discretion and responsibility</td>
<td>Briona Mooney</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regulations</td>
<td>Health and Safety Compliance</td>
<td>Luke Davernport</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regulations</td>
<td>Environmental Compliance</td>
<td>David Noone</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Community</td>
<td>Local Sponsorship</td>
<td>Briona Mooney</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Suppliers</td>
<td>Faster Payment Times</td>
<td>Stewart O’Neill</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Suppliers</td>
<td>More Accurate Forecasting</td>
<td>Stewart O’Neill</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Other stakeholders not illustrated above include the Design department in the U.S.A and Marketing function in Brussels. The Warranty department has also identified a number of requirements, in particular low reliability on some products.

Make a similar listing of requirements for the stakeholders of your own organisation, based on the work you did for Learning Activity 6.6. Add to your portfolio.
Section 6.7
Unit Review

Stakeholder requirements place demands for change and innovation on the organisation. Many of these demands lead directly to new ideas and new goals for the organisation. Other requirements inform the strategic objectives and performance indicators of the organisation.

Some stakeholders are internal, e.g. employees, while most are external.

Customers are principal stakeholders and can include consumers, patients, students, and even colleagues within the same organisation.

Stakeholders can have a transactional or contextual relationship with the organisation, i.e. some external stakeholders can have their requirements influenced by the organisation while others cannot.

A transactional relationship exists where the organisation can influence and change the stakeholder's requirement in some way.

A contextual relationship exists where the organisation has no influence on the requirement.

Understanding who the organisation’s stakeholders are is a key step in defining innovation goals. The next task is to discover what it is that they require.

Requirements are expressions of demand from each of the stakeholders; they can be determined using a number of techniques. More structured techniques for gathering requirements include objective data analysis, Delphi forecasting and quality function deployment.

When wording the requirement, it is useful to use language expressed from the perspective of the stakeholder.

Requirements are ultimately translated into strategic objectives and performance indicators in the innovation management process.

Section 6.8
Self-Assessment Questions

1. Define a stakeholder in a particular organisation
2. Outline the Delphi forecasting technique for developing requirements
3. Explain the terms transactional and contextual requirements
4. Name the fields used for storing stakeholder requirements in a knowledge management system.
Section 6.9
Answers to Self-Assessment Questions

1. A stakeholder is a person or group that has some stake in meeting the objectives of the organisation. Examples of stakeholders include customers, shareholders, employees, regulators and corporate owners.

2. This is a subjective technique for predicting future requirements of stakeholders. It is based on human judgment rather than the analysis of objective data. The Delphi method replaces direct open debate, where one personality may dominate others, by a carefully designed program of interrogation among a group of experts or lead users.

3. A transactional requirement is one that can be influenced or changed by the organisation. For example the requirement for greater profits can be changed in the short term to a requirement for more investment. The contextual requirement is one that cannot be changed or influenced by the organisation. A good example of a contextual requirement is a government regulation.

4. There are a number of fields that can be used to store stakeholder requirements in knowledge management system. Key fields include:

   - Title (the actual requirement in say five to twelve words)
   - Stakeholder (the name of the stakeholder issuing the requirement)
   - Description (a detailed description of the requirement)
   - Responsible Status etc.
Defining Objectives

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Section 7.1
Unit Introduction

Strategic planning has become a popular technique for most organisations in defining organisational goals. The process of strategic planning involves defining key thrusts around which change and innovation will take place, and then identifying key objectives within each thrust. The types of thrust vary significantly between organisations. However, there are some thrusts which are common and can be initially used by any organisation and then later adapted. There are an equally varied number of objectives that an organisation can define.

Section 7.2
Unit Learning Objectives

When you have successfully completed the unit you will be able to:

• Define strategic thrust
• Identify some of the key thrusts for your strategic plan
• Explain why strategic plans should be short and concise
• Name four common objectives currently discussed in the literature
• Develop a list of key objectives for each thrust
• Structure your strategic plan for a knowledge management system

Section 7.3
Identifying Thrusts

There are two basic elements to a strategic plan — strategic thrusts and strategic objectives.

The term 'strategic objective' is often interchangeable with the term 'strategy'. It can also be interchanged with term 'decision.'
The following are a list of strategic thrusts popular in many organisations (Hayes et al. 1988):

1. Capacity
2. Facilities
3. Technology
4. Vertical Integration
5. Workforce
6. Quality
7. Planning
8. Organisation

**Capacity:** This thrust deals with decisions around the issue of increasing, decreasing or maintaining capacity. Capacity refers to machines, labour and facilities. Typical decisions include demand management, outsourcing, floor space utilisation, overtime, second shift, temporary employees, job rotation, multi-skilling, work cells, and so on.

**Facilities:** This thrust deals with decisions around the facilities that are used by the organisation in meeting customer requirements. Facilities include floor space, office space, plant facilities, machine facilities, etc. Decisions include issues such as: capping size of plants, focused factories, power consumption, waste, facilities maintenance and so on.

**Technology:** This thrust deals with decisions around the technology used in the organisation such as machines, computers, computer networks, telephone exchanges and so on. Decisions are required around purchasing, standards, replacement, maintenance, outsourcing and so on.

**Vertical Integration:** This is a group of decisions around the issue of integration with suppliers and other strategic partners such as dealers, customers and other stakeholders regarding finance, processes, technology, location, sharing of information, co-design, and so on.

**Workforce:** This thrust deals with decisions around the workforce in the organisation — direct and indirect labour, management and staff, human resources issues. Issues such as: multi-skilling, job rotation, reward and recognition, social clubs, psychological job criteria, and so on.

**Quality:** This is a group of decisions around quality assurance products processes and services dealing with issues such as quality control, quality management, document control and management, standards, conformance, Environment, health and safety, calibration, and so on.

**Planning:** This thrust deals with decisions around the issue of materials planning, order flow planning, product design planning, shop floor control, logistics, supply chain management, scheduling, housekeeping and so on.
Organisation: This is a group of decisions around changes to the organisation including issues such as management structures, supervisors and lead hands, interaction between sales, design and manufacturing, management systems and so on.

Each organisation will have its own approach to identifying and labelling its strategic thrusts.

It cannot be emphasised enough that each organisation will have its own approach to identifying strategic thrusts. It is rare that two organisations have the same strategic thrusts. The one exception is where organisations choose to adopt the strategic thrusts of well-known methodologies or standards. One such methodology is the ‘balanced scorecard’ that identifies four major thrusts:

1. finance,
2. customers,
3. internal processes and
4. learning & growth.

Learning Activity 7.1
Consult the literature for a detailed explanation of the four thrusts used in the Balanced Scorecard technique.
Add to your portfolio.

Other methodologies that provide strategic thrusts include: ISO9000, EFQM, Malcolm Baldrige award, etc.

Many organisations identify the thrusts after they have completed the identification of strategic objectives.

Case: Figure 7.1 illustrates the strategic thrusts used by a small hotel and a bank respectively. Both groups of thrusts are different but have some similarities. These lists serve to illustrate that different organisations can use the same thrusts but equally are more likely to end up different.

Figure 7.1: Strategic Thrusts of a Hotel and a Bank
Section 7.4
Strategic Objectives

Strategic objectives are the actual objectives, strategies or decisions that an organisation has agreed to implement over a planning horizon (typically one to five years).

It is impossible to provide guidelines for the vast variety of potential decisions that an organisation can make. From time to time it is possible to identify decisions that are common across all organisations. At the time of writing this manual, objectives are popular around the issue of eBusiness, outsourcing, logistics, and quality. Another popular group of objectives at time of writing is in the areas of improved health and safety, environment and flexibility. An important consideration when defining and choosing objectives is the issue of the ability to implement them.

Objectives need to be chosen that have the chance of being implemented with the available resources — time, people and money (Mintzberg, Quinn et al. 1988).

Attempting the impossible can be bad for morale and can lead to greater resistance to change in the future. There needs to be a balance between the objectives of the organisation and the resources and capabilities available to achieve these objectives.
Strategic objectives should not be either too general or too specific.

Objectives which are too general fail to give guidance to individuals during the idea-generation process. Objectives which are too specific take away power from the individual when generating ideas. Some objectives translate easily into projects. Most objectives should simply inform and stimulate the idea-generation process.

Strategic objectives should remain relevant right up to the end of the planning horizon

Learning Activity 7.2
Make a list of the strategic objectives of your organisation.
Add to your portfolio.

Learning Activity 7.3
Now make a list of the strategic thrusts of your own department, based on the organisation’s strategic objectives. Use the list below (or relevant elements of it) to organise the objectives into specific thrusts.

- Capacity
- Facilities
- Technology
- Vertical Integration
- Workforce
- Quality
- Planning
- Organisation

Note: this list may not suit your organisation. If you wish, substitute more suitable thrust categories.
Add to your portfolio.
Section 7.5
Types of Objectives

An organisation can choose from a number of different types of objective it can follow. These types provide the organisation with its direction and focus.

The objectives can be viewed as falling into one or more of the following categories (Porter 1980):

- Cost/leadership
- Differentiation
- Niche market

Cost/leadership objectives
Strategies or objectives in this category seek to improve efficiency and control costs throughout the organisation’s supply chain. This category is populated by organisations who strive to be the lowest cost producers in an industry, through achieving economies of scale. They compete with each other in areas such as process technology, raw material costs and capacity utilisation. Organisations which operate in this category usually sell a standard product.

Differentiation objectives
This category of objective seeks to add value (as defined by customers), to the organisation’s products and services. Such strategies typically involve gaining technological superiority over competitors, continually out-performing competitors in the area of quality, providing better support services to the customer and providing customers with value for their money. This category is populated by organisations who strive to be unique in the industry and ‘stand out’ from competitors.

Differentiation objectives are those decisions for innovation that seek to make changes that differentiate products and services from competitors.

Niche market objectives
Strategies or objectives in this category are focused on narrowly-defined segments of the market (market niche), and attempt to make their organisation the market leader within this niche. Leadership can be achieved by adopting cost leadership or other differentiation strategies, which are designed specifically for the environment of the niche market. This category is populated by organisations which strive to become leaders within a specific market segment. The risks associated with this segment are that success will encourage other organisations into the market niche.
**Learning Activity 7.4**

Analyse your own organisation and identify which of the three categories it falls into: cost leadership, differentiation or niche market?

Give reasons for your answer.

Add to portfolio.

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**Section 7.6**

**Case Study**

The strategic plan adopted by SwitchIt Ltd. at the beginning of the planning period is illustrated in part in Figure 7.3. The main decisions for change over the next three years have been divided into eight strategic thrusts (or groups): Capacity; Responsiveness; Organisation; Workforce; Supplier Chain; Technology; Information; and Quality.

**Figure 7.3: Partial Objectives List for SwitchIT**

NOTE: use the learning activities you created in this unit to develop a similar database for your thrusts and objectives.

**Section 7.7**

**Unit Review**

A strategic plan is composed of thrusts and objectives. The terms ‘strategies’, ‘objectives’ and ‘decisions’ are interchangeable.

A strategic plan typically contains a large number of objectives divided into groups called thrusts.

The following are a list of strategic thrusts popular in many organisations (Hayes et al. 1988):

- Capacity
- Facilities
- Technology
- Vertical Integration
- Workforce
- Quality
Planning
Organisation

Each organisation will have its own approach to identifying and labelling its strategic thrusts.

Strategic objectives are the actual objectives, strategies or decisions that an organisation has agreed to implement over a planning horizon (typically one to five years).

Objectives need to be chosen that have the chance of being implemented with the available resources — time, people and money (Mintzberg, Quinn et al. 1988).

Strategic objectives should not be either too general or too specific.

Strategic objectives should remain relevant right up to the end of the planning horizon. Objectives need to be monitored continuously.

Porter (1980) suggests that objectives can be viewed as falling into one or more of the following categories:

- Cost/leadership
- Differentiation
- Niche market

Differentiation objectives are those decisions for innovation that seek to make changes that differentiate products and services from competitors.

A strategic plan is a living document. After it has been created it can be edited and updated from time to time.

This section has shown how to create a concise plan for any organisation. Strategic plans are created at the beginning of the planning period. They are a guideline for change and innovation, and they must allow some room for interpretation.

Section 7.8
Self-Assessment Questions

1. Define strategic thrust
2. Explain why strategic plans should be short and concise
3. Is a quality standard such as ISO 9000 a strategic plan?
4. Name four common objectives currently discussed in the literature.
Section 7.9
Answers to Self-Assessment Questions

1 A strategic thrust is a label given to a group of objectives. There are many strategic thrusts in a typical strategic plan used for defining goals in an organisation.

2 Modern approaches to strategic planning attempt to engage all employees in idea generation and project execution. Long detailed strategic plans seldom empower many individuals. A short and concise strategic plan offers the best opportunity of engaging as many individuals as possible in understanding the goals of the organisation and engaging in idea generation.

3 Yes. Many organisations depend on widely available methodologies and standards for setting the strategic thrusts and objectives of the organisation. There are many techniques available in the literature. Some standards, such as ISO 9000, provide thrusts and objectives for improving quality within an organisation. Other standards provide similar resources for other areas such as health and safety etc.

4 At time of writing, common objectives include 'developing online ordering', 'implementing GroupWare systems', 'building a more innovative organisation', 'developing systems and processes to allow employees to work from home'. The answer to this question is clearly dependent on the organisation and the perspective of the writer at the time of writing.
Section 8.1
Unit Introduction

Performance indicators are a measurable way of defining goals. Performance targets set goals in the future that need to be obtained. They also monitor current progress towards those future goals and they provide a historical perspective on performance in the past. Indicators can be financial and non-financial. Financial indicators, such as measures of revenues and cost, have been popular in the past. An organisation’s worth is often measured by financial measures such as turnover and profits. This is no longer the case, with almost every organisation worth significantly more than its financial indicators indicate. This is because organisations are now measured in terms of their potential as knowledge organisations. A knowledge-based organisation can innovate — change its products, processes and services — in response to changing market demands. Most performance indicators are now non-financial, such as measuring absenteeism, rate of idea generation, success of new products and so on.

Section 8.2
Unit Learning Objectives

When you have successfully completed the unit you will be able to:

- Define the difference between financial and non-financial indicators
- Define a set of macro measures for an organisation
- Select a mix of financial and non-financial indicators
- Set firm and stretch targets of performance

Section 8.3
Performance Indicators

Various corporate accounting scandals have called into question the reliance on financial indicators to measure the worth of an organisation. Organisations are now regularly worth significantly more than financial measures indicate. This is because knowledge-based organisations often have the potential to innovate and change financial performance in response to changing external demands. This among other reasons has led many organisations to choose mainly non-financial indicators for determining the performance of the organisation. Another reason for choosing non-financial indicators is the
process of engaging individuals in idea generation. Many individuals in an organisation do not understand financial indicators. They require indicators that will motivate them to achieve specific goals that they understand. Finally, many organisations find it difficult to implement a strategy using only financial indicators. They need indicators that align closely with specific objectives (Kaplan and Norton 1996).

Knowledge and innovation based organisations have potential that cannot be measured using solely financial indicators.

The disadvantages with financial indicators include:

- Inconsistency with today's business realities
- Relying on historical data — ‘driving by rear-view mirror’
- Tendency to reinforce functional silos
- Sacrifice of long-term thinking
- Not relevant to many levels of the organisation
- Not linked to strategic objectives

In the 1980s, it was determined that up to 30% of the value of a company was not represented in its financial books. Today that estimate has risen to 75% with many organisations such as Google and Amazon being significantly higher.

Section 8.4
Defining Indicators

Indicators show progress towards defined performance targets and motivate people towards achieving goals.

Key questions for performance indicator process are:
What has happened?
Why has it happened?
Is it going to continue?
What are we going to do about it?

Understanding and measuring indicators leads to idea generation and corrective actions.

Indicators have the following attributes:

- Directly related to strategic objectives
- Repeatable over time, allowing comparisons
- Foster improvement rather than monitoring
• Measurements are reliable and verifiable
• Primarily non-financial
• Maximum number of measures (<7)
• Change over time as conditions change
• Simple and easy to use
• Provide fast feedback
• Leading rather than lagging

**Lagging indicators**, such as customer satisfaction and financial performance, are historical. They present information on customer behaviour in the past.

**Leading indicators**, on the other hand, such as lead-time, quality, and costs, indicate potential customer satisfaction in the future.

Many organisations choose to measure a significant number of performance indicators, as if they cannot decide which indicators are more important than others. The difficulty with this is that too many indicators clutter up the decision-making process and prolong meetings. Conventional wisdom suggests that every organisation might choose no more than seven indicators. Indicators can also be linked hierarchically throughout a large organisation. In this way an individual or team may be driven by only seven indicators but the total number of indicators across a large organisation can be significantly higher.

**Learning Activity 8.1**
Search Online: [http://management.about.com](http://management.about.com) using keywords ‘key performance indicators’
Make notes on your findings.
Add to your portfolio.

**Section 8.5**
**Sample Indicators**

One of the first steps in choosing indicators is to look at macro indicators.

All indicators stem from one of three macro indicators: cost, time and accuracy. In recent years other macro indicators have been added to this list. They include flexibility, culture and environment.

An alternate way of using macro indicators is presented below:

**Operations:**
• Productivity (hours/unit)
• Throughput (units per day)
• Utilisation (output/capacity)
Sales and Marketing:
- Sales per region
- Sales per model
- Marketing costs

People:
- Labour turnover
- Overtime
- Absenteeism

Research and Development:
- R&D Expenditure
- Failure Rates
- Additional Revenue Created
- Value Analysis Savings

Environment:
- Emissions
- Scrap and Wastage
- Accidents
- Litigation

Every indicator must have a unit of measure.

For example, productivity can be measured in terms of hours per unit or utilisation in terms of output over capacity.

Each indicator consists of three major measurements:

- its origin or what it measured at some point in the past,
- its current measurement, and
- its target performance or what it should measure at some point in the future.

Many organisations like to add the fourth measurement — its stretch target. The stretch target is a target performance beyond some point in the future. It allows individuals to consider stretching beyond the current target and achieve breakthrough performance for the current period.
Case: LCIT Solutions is an IT service organisation. The organisation's goal is to provide high quality IT services and products that satisfy customer needs. Its innovation team consists of personnel of different levels from various functional departments including the managing director, all managers, and some experts from the technical group, human resources and finance. The team meet monthly to discuss the execution of its innovation plan, and in particular the performance of its indicators. In addition, various groups in the organisation meet weekly to review lower-level child indicators, and agree actions for keeping them on track. Figure 8.1 shows the status of its current performance indicators.

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Responsible</th>
<th>% Complete</th>
<th>Status</th>
<th>Chart</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appraisal</td>
<td>Paula Feeney</td>
<td>73</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>Market Expansion</td>
<td>Tona Joyce</td>
<td>2</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>Training</td>
<td>William Gatas Kelly</td>
<td>2</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>Defects per Installation</td>
<td>Jason Lydon</td>
<td>36</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>Late Payments</td>
<td>Brian Greash</td>
<td>65</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>Graduate Recruitment</td>
<td>Paula Feeney</td>
<td>54</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>Market Share (North)</td>
<td>Tona Joyce</td>
<td>✔</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>Market Share (East)</td>
<td>Tona Joyce</td>
<td>✔</td>
<td>✔</td>
<td></td>
</tr>
</tbody>
</table>

Figure 8.1: LCIT Solutions Performance Indicators

The team has chosen eight performance indicators. For example, the Defects per Installation measures the errors in each IT installation. A record of errors is kept to stop them happening in the future. All these indicators are performing well except one that needs attention -- training. On closer examination, the training target of ten hours per quarter for each employee is not being met.

Section 8.6
Performance Charts

Performance indicators can be represented graphically using a performance chart.

The key attributes of the performance chart are illustrated in Figure 8.2. Each indicator has an origin, with an origin date and an origin value. This is typically the beginning of a particular year. Each indicator also has a target, with a target date and target value. Performance charts may also have stretch values and stretch dates. Another characteristic of a performance chart is that they record values over the planning horizon. These are illustrated as small stars in Figure 8.2. Finally, the performance charts may also have upper and lower control limits. Values that fall outside these limits may be treated differently i.e. if the value is out of control it may be coloured red to draw attention to this indicator for remedial action. Charts should be kept simple.
Section 8.7
Case Study

The status of key performance indicators at SwitchIt Ltd. is illustrated in Figure 8.3. 'Defects per Unit' continues to be a major concern due to a number of old machines and practices among some employees. John Sheehan, Quality Coordinator, is satisfied that machine age and operator training are the main causes of low quality.

<table>
<thead>
<tr>
<th>Title</th>
<th>Unit</th>
<th>Current</th>
<th>Target</th>
<th>Responsible</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improve Cost Savings</td>
<td>$</td>
<td>120k</td>
<td>300k</td>
<td>Mary Roche</td>
<td></td>
</tr>
<tr>
<td>Increase Delivery Performance</td>
<td>%</td>
<td>69%</td>
<td>95%</td>
<td>Michael Clark</td>
<td></td>
</tr>
<tr>
<td>Reduce Absenteeism</td>
<td>days/month</td>
<td>45</td>
<td>30</td>
<td>Brida Mooney</td>
<td></td>
</tr>
<tr>
<td>Defects per Unit</td>
<td>defects/unit</td>
<td>23</td>
<td>10</td>
<td>John Sheehan</td>
<td></td>
</tr>
<tr>
<td>Reduce Warranty per 1000 units per month</td>
<td>$</td>
<td>23k</td>
<td>20k</td>
<td>David Noone</td>
<td></td>
</tr>
<tr>
<td>Reduce Manufacturing Lead Time</td>
<td>days</td>
<td>5</td>
<td>4.5</td>
<td>Danny Mulryan</td>
<td></td>
</tr>
</tbody>
</table>

Cost savings of 300k for the current year are progressing well. A chart of status for 'Improve Cost Savings' is illustrated in Figure 8.4.
Figure 8.4: Performance Chart

Relationships between Indicators and Objectives are illustrated in Figure 8.5 in part. All objectives can be measured by the indicators defined.

Figure 8.5: Objectives vs. Indicators

Learning Activity 8.2
Spend some time reviewing the chart features within Microsoft Excel or equivalent software package. Explore various types of chart and various features that can be edited within the chart area.
Learning Activity 8.3
Develop a set of performance indicators for your own organisation (or department/section if you work for a large organisation). Include both financial and non-financial. Explain your rationale for choosing these particular indicators.

Set up the list on EXCEL, using Figure 8.5 as a guide, to show the relationship between your set of indicators and organisational objectives.

Section 8.8
Unit Review

Performance indicators or metrics are a measurable way of defining and monitoring an organisation’s goals.

Indicators show progress towards defined performance targets and motivate people towards achieving goals. They provide a tangible incentive for employees to generate ideas, evaluate progress and take remedial action as required.

Performance indicators are primarily non-financial. They foster improvement and innovation rather than present historical financial data.

Indicators can either lead or lag innovation expectations, and typically only seven are necessary for any organisation. These seven can be linked hierarchically to other indicators within the organisation so that any one group is focused on no more than seven.

All indicators stem from one of three macro indicators: cost, time, accuracy; some organisations add flexibility, culture and environment.

Every indicator must have a unit of measure.

Performance indicators are typically illustrated using performance charts and tables.

Section 8.9
Self-Assessment Questions

1. What is the difference between a financial and a non-financial performance indicator?

2. Why are financial indicators less important when motivating employees to generate ideas?

3. Explain why seven indicators is better than thirty.

4. Indicate the key data points in a performance chart
Section 8.10
Answers to Self-Assessment Questions

1 Financial indicators measure financial data such as cost or profit. Non-financial indicators measure such things as absenteeism, productivity, quality, culture, lead time and utilisation.

2 Financial indicators are often misunderstood by most employees. They are remote from the process been developed. Motivating employees to generate ideas means defining indicators with which they identify, that they can easily measure and that they can impact with remedial actions.

3 Each week or month the innovation team most come together to discuss progress for each of the performance indicators. In addition they may discuss progress of objectives, requirements, and actions such as new ideas and existing projects. Keeping the number of indicators small allows all individuals to remain focused on improvement.

4 The key data points are origin date and value, target date and value, stretch date and value, results data by week, month or quarter and upper and lower control limits.
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Section 9.1
Unit Introduction

Ideas occur during the problem-solving process and when individuals are held responsible for achieving goals.

Serendipity is where an idea appears in the right place and at the right time. It is an unexpected and fortunate discovery. However, most ideas are planned. They occur as a result of a planned set of activities such as problem identification, brainstorming and ranking. Good ideas go on to become projects that require resources — time, labour and money — and also need to be scheduled. Some ideas can be implemented immediately with very little resources. These are sometimes called 'quick wins'.

Section 9.2
Unit Learning Objectives

When you have successfully completed the unit you will be able to:

- Define creativity and the idea generation process
- Explain the main sources of ideas in an organisation
- Explain one technique about how to evaluate an idea
- Structure a form for gathering ideas

Section 9.3
Creativity

Creativity begins by identifying a problem or a goal. Individuals or teams with the right expertise, motivation and creative thinking skills work on the problem or goal, generate ideas, test the ideas and ultimately implement the ideas as quick wins, corrective actions, incremental improvements or projects.

The vast majority of ideas will be scrapped, recycled, merged with other ideas, or postponed.

Perhaps one idea in a hundred will progress to become a solution, or from a different perspective — for every good idea over 100 ideas need to be generated.
There are a number of ways of encouraging the idea-creation process in any organisation. Some of the more popular ways are listed below:

1. Providing a diverse information service
2. Employing staff with diverse interests
3. Having a supportive management style
4. Allowing failures to be willingly tolerated
5. Allowing individuals room to pursue their own ideas
6. Rewarding success
7. Providing idea suggestion programs
8. Providing good strategic direction
9. Benchmarking and access to external stimuli
10. Providing a challenging environment

Individuals will become creative if they are motivated, competent and possess problem-solving and idea-generation skills in an environment that provides well-defined goals and supports for the innovation process.

Case: In the 1920s, 3M designed and sold sandpaper products. A young designer observed problems being experienced by painters in a car shop when they tried to put a coloured stripe on a body panel. They used tape to blank out the stripe on the panel when putting on the first colour. They then removed the tape and put a second tape over the edges of first colour before painting the stripe. When they removed the second tape, some of the first colour was also removed. They either restarted the process or touched up the paintwork. Either way, time was increased or quality was reduced. The young designer considered the problem and determined to create a less sticky tape. His boss told him it was outside their scope, but the designer ignored this and worked weekends to create a solution. His boss meanwhile decided to be patient and gave him some free time from his normal duties. The designer eventually created masking tape which went on to become one of 3M’s biggest selling products. His boss learned from the experience and decided to implement an innovation culture. This culture is founded on some of the lessons mentioned in this story. 3M went on to become one of the largest corporations in the world with many different types of adhesive-based products.

Section 9.4
Sources of Ideas

There are many sources of ideas that fix a particular problem or achieve a particular goal.
Sources of ideas can be divided into six areas:

1. New knowledge
2. Ideas of customers
3. Lead users
4. Empathetic design
5. Invention factories
6. Open market innovation


New knowledge: These are ideas from employees, suppliers, distributors and individuals in the extended organisation. Ideas are typically generated from new knowledge and insights gained from books, magazines, competitive benchmarking, collaborative benchmarking, practice and experience. Many sources of new knowledge can be used to generate new ideas.

Ideas of customers: Customers are a main source of new ideas for products, processes and services. Customers are useful for identifying problems and weaknesses. Market research of large customer bases can also identify future trends in customer buying behaviour. One weakness of using customers solely is that customers often defend the products they purchase, and hence usually have poor ideas regarding future products, processes or services.

Customers are a key source of new ideas for improving products but are often are incapable of seeing new possibilities.

Lead users: Some customers are particularly interested in engaging in the innovation process and ‘push the barrier’ of usage for particular products, processes and services. These are called lead users. Lead users are important for collaborative benchmarking, co-design, and testing and validation of new ideas.

Empathetic design: This design process involves observing users of the products, processes and services. Users are observed often by camera over a prolonged period. Their usage pattern often shows up pleasure, frustration, and so on that can guide designers regarding people’s potential likes and dislikes of a particular product or service.

Learning Activity 9.1
Make notes on what you find.
Add to your portfolio.
Invention factories: Invention factories are special laboratories within organisations and those shared by organisations and universities. Laboratories such as Bell Labs hire experts from diverse backgrounds to work on ideas for the future. These ideas are principally scientific in nature with solutions often only possible in the long term.

Learning Activity 9.2
Search the literature for detailed explanation of the ‘Force-field Diagram’

Open market innovation: This approach to generating ideas involves purchasing and taking over other organisations which have already generated complementary innovations. The combination of skills and ideas from both organisations is blended and mixed to generate new opportunities for the expanded organisation. Open Innovation also refers to loose-knit communities that collaborate together on ideas. The Linux operating system for computers, for example, was initiated by one person but was developed by a very large open community of software enthusiasts.

Open innovation is about collaborating with others outside the organisation on precompetitive research, and sharing both knowledge and burden of failure.

Case: Theme Park Design Group is an entertainment company that markets, designs and operates medium-sized theme parks. The design group department receives demands for new features from the marketing department. It generates new designs for the operations department who construct the new features.

<table>
<thead>
<tr>
<th>Idea Description</th>
<th>Responsible</th>
<th>Complete</th>
<th>Status</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Career Development Plan</td>
<td>Calvin</td>
<td>50</td>
<td>Complete</td>
<td>Draft</td>
</tr>
<tr>
<td>Design a computer game scene within a park</td>
<td>Costello</td>
<td>30</td>
<td>Complete</td>
<td>Draft</td>
</tr>
<tr>
<td>Allow staff with flexibility</td>
<td>Calvin</td>
<td>15</td>
<td>Complete</td>
<td>Draft</td>
</tr>
<tr>
<td>Improve the Department Management System</td>
<td>Costello</td>
<td>20</td>
<td>Complete</td>
<td>New Project Merge</td>
</tr>
<tr>
<td>Purchase new computers from Apple company</td>
<td>Calvin</td>
<td>25</td>
<td>Complete</td>
<td>Merge</td>
</tr>
<tr>
<td>Recruit experienced designers from other companies</td>
<td>Costello</td>
<td>99</td>
<td>Complete</td>
<td>Draft</td>
</tr>
<tr>
<td>Simplicity design specification documents</td>
<td>Calvin</td>
<td>0</td>
<td>Complete</td>
<td>Abort</td>
</tr>
<tr>
<td>Training in safety design</td>
<td>Calvin</td>
<td>80</td>
<td>Complete</td>
<td>Merge</td>
</tr>
<tr>
<td>Extend a Korean history session in Beast Theme Park</td>
<td>Giulia</td>
<td>99</td>
<td>Complete</td>
<td>Merge</td>
</tr>
<tr>
<td>Simplify the operation steps of a certain ride</td>
<td>John</td>
<td>0</td>
<td>Complete</td>
<td>Merge</td>
</tr>
</tbody>
</table>

*Note: Urgent attention required* *Green progressing satisfactorily* *Red: requires attention* *Check completed*

Figure 9.1: Ideas Portfolio for Design Department

The group have a number of concepts and ideas in their portfolio (see Figure 9.1) and have ranked them according to their level of impact and risk. A decision has been made for each idea. Some of these ideas have been translated into projects.
Section 9.5
Mind Mapping

There are a number of tools that can be used in the idea creation process. Mind mapping has become a popular tool in recent years for a wide variety of problem-solving and idea generation tasks. Mind mapping, which takes its ideas from the original 'spider diagram', can be used to create concepts, associations between concepts, and hierarchies of concepts. These are also called tree diagrams and topic maps.

**Approach:** Lay out a large sheet of paper in landscape orientation and write a heading for the concept in the centre of the page. For each major sub-topic or cluster of material, start a major branch from the central concept, and label it. Each sub-sub-topic or sub-cluster forms a subordinate branch to the major branch. Carry on in this way for ever finer sub-branches. It may be appropriate to put an item in more than one place, cross-link it to several other items, or show relationships between items on different branches. The approach at first seems trivial, but mind maps are an aid to mental mapping of individuals or groups. Mind maps rarely have meaning outside of the individual or group. They act as a decision support tool for the idea generation process. An example of a mind map is given in Figure 9.2.

![Figure 9.2: Mind Map](image)

Various software packages are now available that support the generation and editing of mind-maps. The software can also accommodate attachments such as notes, hyperlinks and documents. Radical tree diagrams, hierarchical tree diagrams, and clustering methods all use the same hierarchical logic. However, they have different optical impacts, and dissimilar abilities to characterise derived connections such as over-lapping, cross-linking etc.

Mind mapping creates associations and relationships between words and objects that help to create mental maps and understanding of meaning and context.
Learning Activity 9.3
Pick a problem in your organisation or work area. Create a mind map to generate ideas for solving the problem. Represent on the map some of the implications of the solutions for different departments/work areas etc. Add to your portfolio.

Section 9.6
Evaluating Ideas

The most direct way of evaluating an idea is by judging its merits with respect to its impact on meeting the goals of the organisation versus its risk of not achieving its impact. Score each idea on a scale from one to five on its impact, and then score each idea on a scale from five to one on its risk. Multiply both scores and you get an overall score for the idea. Other factors that need to be considered are the technical and business competencies available in the organisation. There is little point in choosing a good idea if the competencies to implement and exploit the idea are not available in the organisation. Cost benefit analysis is another direct way of evaluating an idea, although it is often difficult to determine benefit from an idea that has not been tested in the marketplace.

Another approach to evaluating ideas is the buyer-utility map (Kim and Mauborgne 2000). The buyer-utility map is a two-dimensional matrix with six utility levers on the y-axis and six stages of buyer experience on the x-axis, see Figure 9.3. The approach suggests that every customer measures the utility of a product, process or service according to the criteria on the map.

The six utility levers are: productivity, simplicity, convenience, risk, fun and image, and environmental friendliness.

If a comparison of product, process or service shows yours is better than competitors’, then the idea is a good one.

All six of these utility levers can then be applied for each stage in the buyer experience lifecycle from purchase, delivery and use to supplements to maintenance and disposal.

Again, if the comparison with competitors shows your idea is better, then the idea is a good one.

An alternative approach to using the buyer-utility map is to use it to compare customer requirements with the idea.
Case: A low cost airline recently completed a buyer-utility map for its innovative service to airline passengers. They later contrasted this map with the map developed following an analysis of requirements by airline passengers.

The map is illustrated in Figure 9.3.

Learning Activity 9.4
Search http://www.blueoceanstrategy.com/ for more detailed work on the Buyer-Utility Map.
Make notes on what you find.
Create a buyer utility map for a product or service from your own organisation, or for a product or service with which you are familiar.
Add to your portfolio.

During the purchasing stage, the Internet contributes towards lower cost (i.e. collective productivity), convenience, lower risk (since the customer interacts directly with the airline), and fun and image (since customers often boast about the price of their tickets with friends). Simplicity is not seen as an advantage since interacting with a web site is less simple than perhaps interacting with a travel agent. During the delivery of tickets stage the use of the Internet as a delivery mechanism provides numerous advantages. During the use of the service customers viewed the 'no frills' model as advantageous in almost all utility levers. Finally, in the supplements phase, activities such as changing dates and repurchase due to missed flights again lead to a more productive service since new tickets purchased on the spot are also not expensive. The maintenance and disposal stages were not relevant for this service.
Section 9.7
Case Study

The are currently over 230 problems at SwitchIt Ltd. on the ‘Reactive Problem’ list and sorted according to Impact, Risk and Priority (See Figure 9.4). Every machine and assembly station has a ‘Proactive Problem’ list with identified activities for avoiding the problems occurring.

| Problems |
|-----------------|----------|--------|--------|--------|--------|--------|
| **Group**       | **Title**                        | **Impact** | **Risk** | **Priority** | **Due** | **Responsible** | **Status** |
| Proactive       | Switch housing difficult to assemble | 4         | 3       | 5       | 06/2007 | David Noon |           |
| Prospects       | Time to prepare packed bags       | 3         | 2       | 4       | 01/2007 | John Sheehan |           |
| Reactive        | Pins shearing during tightening   | 5         | 4       | 5       | 04/2007 | Stewart O’Neill |           |

**Figure 9.4: Problems**

Every employee is encouraged to generate ideas that can lead to goal attainment (See Figure 9.5). Employees have full access to the objectives and indicators of the organisation. Ideas have been grouped by the ‘Source’ of the idea (e.g. Goals, Problems, New Knowledge, Benchmarks, Employees, Customers, etc.). The table below illustrates some sample live ideas.

<table>
<thead>
<tr>
<th>Ideas</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Group</strong></td>
</tr>
<tr>
<td>Goals</td>
</tr>
<tr>
<td>Goals</td>
</tr>
<tr>
<td>Problems</td>
</tr>
<tr>
<td>Knowledge</td>
</tr>
</tbody>
</table>

**Figure 9.5: Ideas**

**Learning Activity 9.5**
Search Online: [http://www.amazon.co.uk/](http://www.amazon.co.uk/) and look up books authored by Hayes and Wheelwright. Do a general search for their work. See what you can find out about their ideas.
Make notes on your key findings.
Add to your portfolio.
Section 9.8
Unit Review

Ideas evolve from problems and well-defined goals. Most ideas are planned, and many ideas are merged, postponed or rejected.

Sources of ideas include:
New knowledge
Ideas of customers
Lead users
Empathetic design
Invention factories
Open market innovation

Customers are a key source of new ideas for improving products but are often incapable of seeing new possibilities.

Open innovation is about collaborating with others outside the organisation on precompetitive research, and sharing both knowledge and the burden of failure.

There are many tools that can be used for generating or working with ideas. These include brainstorming and mind-maps.

Mind mapping creates associations and relationships between words and objects that help to create mental maps and understanding of meaning and context.

The principal away to measure the potential success of an idea is to compare it with the goals of the organisation and the resources available to implement the idea.

A simple form for capturing ideas includes data fields such as for the risk and benefit associated with the idea.

Other techniques such as the buyer-utility map are a little more involved.

Buyer utility map uses six utility levers to assess the usefulness of the product or service to the customer: productivity, simplicity, convenience, risk, fun and image, and environmental friendliness.
Section 9.9
Self-Assessment Questions

1 What is creativity?

2 List five specific and additional stimuli to those mentioned in the text above that can be used to help individuals and teams generate new ideas.

3 Can you identify some of the lessons learned by 3M and which they now use as part of their innovation culture from the case presented earlier?

4 What are the six principal sources of ideas for any organisation?

5 Name the six utility levers that can be used by customers in evaluating the value of a product, process or service.
Section 9.10
Answers to Self-Assessment Questions

1. In the present context, creativity is generation of ideas to solve a problem or to reach a defined goal.

2. Newspapers, Internet, social outings, conferences, libraries, employee of the month, working from home, etc.

3. Determination, taking risks (ignoring your boss), working outside normal hours, patience, allowing free time to innovate, learning, developing an innovation culture.

4. New knowledge, customers, lead customers, empathetic design, invention factories and open source innovation.

5. Productivity, simplicity, convenience, risk, fun & image and environmental friendliness.
Managing Projects

Section 10.1
Unit Introduction

Some good ideas can be implemented immediately as quick wins, others that require significant resources can become projects.

Projects are non-permanent goal-centred actions with a predefined start date and due date.

Projects are unique — no two projects will ever be the same. They have leaders and teams. Every organisation typically has a number of projects. It is beyond the scope of this section to discuss project management in detail. What is presented below are the salient features of managing projects within the overall context of managing goals, actions, teams, results and community.

Some ideas grow to become resource-intensive projects.

Section 10.2
Unit Learning Objectives

When you have successfully completed the unit you will be able to:

- Outline the key ideas behind project management
- Explain the difference between an objective and a project
- Outline the key stages of a project lifecycle
- Conduct a simple cost benefit analysis for a project
- Distinguish between disruptive, innovative and incremental projects

Section 10.3
Examples of Projects

A project is a unique non-permanent goal-centred activity with a predefined lifecycle, constrained by cost and resource availability. Projects have a start date and due date. There are many examples of projects in organisations:

- Installing a new piece of production equipment
- Benchmarking for a proposed new software system
- Restructuring a department
- Installing a new telephone system
- Developing a preventative maintenance program
• Building an office extension
• Purchasing a new piece of software
• Installing a computer network

Many projects involve changes to technology, processes, information systems, and human organisations. As such they are complex undertakings and involve many variables, risks and assumptions.

It is important to point out that there is often ambiguity between objectives and projects, and sometimes the difference between them is very small. Consider objectives as broad goals with a fixed time horizon, typically one to five years. Projects, on the other hand, will have varying start dates and due dates, and except for very large projects would typically be executed within twelve months for many organisations. Each objective might spawn a number of projects, and although projects might be completed at their due date, objectives are expressed in such a way that they can remain relevant for the entire planning period.

There is often ambiguity between what is a strategic objective and what is a project. Projects typically have start and end dates inside the dates of the planning horizon.

Section 10.4
Managing Projects

A project passes through a number of distinct activities during the course of its life. Typical activities include Conceptualisation, Design, Development and Implementation. Each activity is unique, but interdependent with other activities. Project activities are timed to happen sequentially or in parallel. There are numerous ways that activities can be defined. Activities can be named through active verbs to represent an act or endeavour (e.g. Implement) or by nouns (e.g. Implementation). As we have seen when defining requirements and objectives, active verbs are useful for adding dynamism to an activity or action. A typical set of generic activities for a project is listed below.

• Define problems, issues, concerns or objective/goals of the project
• Gather information from relevant sources — environment, users, managers, libraries
• Search for a number of preliminary solutions and select best option
• Design Preliminary System that meets project goals
• Evaluate and cost the project and seek management approval
• Document New System through detailed design or specification
• Implement New System
• Manage project activities through planning, controlling, staffing, organising and leading.
Scheduling is an important activity when leading and managing projects. There are a number of scheduling techniques, including critical path analysis, PERT and Gantt.

The Gantt technique is by far the more popular within organisations and many software tools now exist to support the creation and editing of Gantt charts. A simple Gantt chart is illustrated in Figure 10.1. The activities used in this Gantt chart are the generic activities listed earlier.

Learning Activity 10.1
Search Online: http://www.pmi.org/ and review resources available for gaining a better understanding of ‘Project Management’ and ‘Project Portfolio Management’
Make notes of key points.
Add to your portfolio.

Resource planning is another important activity when leading and managing projects. Projects require resources such as people, time and money.

If a project requires significant resources, this means that fewer projects can be carried out simultaneously. A balance is required between the resources available and the activities that need to be carried out.
Section 10.5
Stage Gate Process

The stage gate process is a methodology for evaluating projects at various stages in their lifecycle (Cooper 1988). A project life cycle is visualised as containing a number of stage gates. At each stage gate, the project team and senior management review the progress of the previous stage. In Figure 10.2, for example, a project is planned with five stages.

![Figure 10.2: Stage Gate Process](image)

At the end of each stage, progress is reviewed and a decision is taken on any actions that need to be carried out, and whether the project should proceed to the next stage. This is a formal review for all projects. The success of a project depends exclusively on what happens inside the project i.e. is the project meeting its goals? Later we will see a portfolio approach where the portfolio of projects as a whole is reviewed, rather than detailed stages within each project.

The end of each stage involves a review of the project and decision on whether to proceed to the next stage.

Section 10.6
Financial Analysis

All projects have a cost. There would be a ‘capital’ cost associated with any equipment or services required to execute the project. There may also be a ‘recurrant’ cost associated with running the new process or service. Earlier we discussed the levels of investment that an organisation makes in innovation. We found that on average, an organisation spends just under 4% of turnover on various projects. For a one billion euro turnover organisation, this means that 40K Euro is available for innovation projects. The expectation is that this investment will lead to increased revenue, better quality and reduced costs. The anticipation would be that the organisation will at least recover its investment and ideally significantly more.
Increased revenue and reduced costs can be collectively called ‘benefit’. One can argue that every initiative must achieve a reasonable cost benefit ratio in the short or long term.

There are a number of techniques that can be used for determining the value of a project in terms of costs versus benefit. Three popular techniques are:

- **Payback**
- **Present Worth Value**
- **Return on Investment (ROI)**

**Payback:** The payback technique is the simplest way to determine the value of a project. It involves three variables — initial cost, recurrent cost and benefit (annual revenues and cost savings). The payback ratio is calculated as: initial cost / (benefits – recurrent cost). If the ratio is less than three then certain types of project may be considered meritorious. In other words the project will pay for itself within three years. Some projects such as ‘installing a telephone system’ may have a much longer pay-back period but still be considered meritorious for reasons other than cost-benefit. The major advantage with payback technique is that it is simple to implement and easy to understand.

Payback is the simplest and consequently the most important method of evaluating investment alternatives.

**Case:** A machine costs €85,000 and generates revenues of €55,000 per year for 7 years. It costs €30,000 to operate the machine. At the end of year 7 the machine is scrapped. Determine payback period.

Benefit = 55000
Recurrent Cost = 30000
Initial Cost = 85000
Payback = 85000/(55000-30000)
Payback = 3.4 years

This project will pay for itself in 3.4 years. After this time the initiative will be a net contributor to overall revenue.

**Present Worth Value:** The present worth method creates equivalent present value of all current and future cash flows given the rate of return desirable. If the aggregate value is positive, then the return exceeds rate of return criteria. If the aggregate value is negative, then investment does not meet criteria. For example an organisation may expect a rate of return for all investments of say 8%. Any initiative that does not meet these criteria is negative. The advantage
with this technique is that it is more rigorous than the pay-back technique, and computes all future cash flows to today's value. A disadvantage is that it involves interest rates and treats all projects the same way. Some meritorious projects such as 'installing a telephone system' will always be negative.

Return on Investment: This technique improves the present worth of value technique by not using a fixed rate of return. In this technique ROI is calculated using a compound interest formula. The value of interest that drives costs and benefits to zero is determined. The advantage with this technique is to allow each individual initiative have its own return on investment percentage. A disadvantage is that it involves interest rates and formulae which can be time-consuming and difficult for some people.

Section 10.7
Product and Process Projects

The types of projects in product and process innovation can be classified according to their degree of change.

This is illustrated in Figure 10.3. The degree of change to products can be classified as:

1. new core,
2. next generation,
3. addition to family,
4. add-ons and enhancements, and
5. component changes
(Wheelwright 1992)

The degree of change to processes can be classified as:

- new core,
- next generation,
- single department upgrade, and
- tuning and incremental upgrades.
Projects can be classified in a number of ways.

**New Core**: This activity is usually associated with a major new product and process development. The technology is highly inventive and the project as a whole will have a very high profile, requiring a large amount of resources. These products and processes were referred to earlier as disruptive technologies and will require radically new facilities and business processes.

**Next Generation**: The provision of next generation products and processes involves updating existing technologies to reflect state of the art but without changing the core process. The products remain similar and the processes use similar technology. As with the previous activity, projects in this classification require major resources. Next generation product and process development equates roughly to the discussion on radical innovation discussed earlier.

The other types of projects for both products and processes involve lesser degrees of change. They are often referred to as incremental innovation or continuous improvement. Figure 10.3 illustrates three main types of project: disruptive, innovative and incremental.

**Disruptive projects** are major projects and will require professional and experienced project management skills and tools. **Innovative projects** are relatively routine and require relatively routine project portfolio management skills. Finally, **incremental projects** often require no formal project management skills or tools, but rely instead on the skills and experience of specialists.
Case: Sheet Metal Industries is a manufacturing plant that produces metal panels for the automobile industry. Its mission is ‘Manufacturing Excellence through Teamwork’ and it has produced a Manufacturing Development Plan that outlines a set of strategic objectives and expected performance targets. One of its primary goals is cost reduction. Figure 10.4 illustrates its current portfolio of projects.

<table>
<thead>
<tr>
<th>Projects</th>
<th>Capital</th>
<th>Recurrent Savings</th>
<th>Payback (yes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISO Implementation</td>
<td>60000</td>
<td>100000</td>
<td>20000</td>
</tr>
<tr>
<td>Equipment Integration</td>
<td>70000</td>
<td>100000</td>
<td>20000</td>
</tr>
<tr>
<td>Old Equipment Replacement</td>
<td>200000</td>
<td>300000</td>
<td>20000</td>
</tr>
<tr>
<td>High Tech upgrade</td>
<td>400000</td>
<td>100000</td>
<td>300000</td>
</tr>
<tr>
<td>Personal Training</td>
<td>10000</td>
<td>50000</td>
<td>10000</td>
</tr>
<tr>
<td>Eco-Machining</td>
<td>10000</td>
<td>60000</td>
<td>10000</td>
</tr>
<tr>
<td>Software Management Consolidation</td>
<td>60000</td>
<td>100000</td>
<td>50000</td>
</tr>
<tr>
<td>Internal Development</td>
<td>15000</td>
<td>100000</td>
<td>35000</td>
</tr>
<tr>
<td>Maintenance Improvement</td>
<td>30000</td>
<td>150000</td>
<td>60000</td>
</tr>
<tr>
<td>Safety Standards Implementation</td>
<td>100000</td>
<td>400000</td>
<td>80000</td>
</tr>
<tr>
<td>Recycling Process Development</td>
<td>40000</td>
<td>30000</td>
<td>10000</td>
</tr>
<tr>
<td>Software bug reduction</td>
<td>50000</td>
<td>40000</td>
<td>10000</td>
</tr>
<tr>
<td>Robotics upgrade</td>
<td>350000</td>
<td>100000</td>
<td>100000</td>
</tr>
<tr>
<td>Demmunicatiom</td>
<td>30000</td>
<td>15000</td>
<td>15000</td>
</tr>
<tr>
<td></td>
<td>1118000</td>
<td>415000</td>
<td>110000</td>
</tr>
</tbody>
</table>

Figure 10.4: Project Portfolio for Manufacturing Firm

The full portfolio of projects currently has a capital expenditure of over 1 million euros. The most expensive project is a ‘high tech upgrade’ of its sheet metal machinery. This particular project will also have additional recurrent costs of 100,000 euros. However the saving in terms of quality improvement, additional capacity and improved productivity would be 300,000 euros annually. The project has a payback of two years. Most projects in the portfolio pay for themselves within two years, except one. The ‘recycling process development’ project has a longer payback period and may be selected because of its strategic importance rather than cost-benefit.

Section 10.8
Case Study

The top seven approved projects at SwitchIt Ltd. are illustrated in Figure 10.5. The first table shows the current progress of the projects. At the time of writing, the ‘Investigate ERP System’ project was currently waiting for new information from headquarters. The ‘Develop Workgroup Procedures’ project was also waiting for clarification of participation from worker representatives.
The table below illustrates the cost benefit analysis carried out on the current portfolio of projects. There is currently a high priority on the ‘Install Robotic Welding’ and ‘Redesign Assembly Line’ projects.

### Projects

<table>
<thead>
<tr>
<th>Title</th>
<th>Start</th>
<th>Due</th>
<th>Responsible</th>
<th>%Complete</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Install Robotic Welding</td>
<td>3/06</td>
<td>3/07</td>
<td>David Boone</td>
<td>45%</td>
<td>In Progress</td>
</tr>
<tr>
<td>Redesign Assembly Line</td>
<td>6/06</td>
<td>12/06</td>
<td>Michael Clark</td>
<td>35%</td>
<td>In Progress</td>
</tr>
<tr>
<td>Investigate ERP System</td>
<td>3/06</td>
<td>6/06</td>
<td>Danny Mullin</td>
<td>90%</td>
<td>Waiting</td>
</tr>
<tr>
<td>Develop Workgroup Procedures</td>
<td>1/06</td>
<td>3/06</td>
<td>Brida Moneey</td>
<td>20%</td>
<td>Waiting</td>
</tr>
<tr>
<td>Restart Sports and Social Activities</td>
<td>5/06</td>
<td>5/06</td>
<td>Brida Moneey</td>
<td>50%</td>
<td>In Progress</td>
</tr>
<tr>
<td>Implement Innovation Training</td>
<td>10/06</td>
<td>12/06</td>
<td>Gary O'Halloran</td>
<td>100%</td>
<td>Complete</td>
</tr>
<tr>
<td>Implement eAuctions on selected items</td>
<td>4/06</td>
<td>10/06</td>
<td>Stewart O'Neill</td>
<td>0%</td>
<td>Not Started</td>
</tr>
</tbody>
</table>

### Figure 10.5(a): Projects

### Figure 10.5(b): Projects

**Section 10.9**

**Unit Review**

Project management is an important part of managing actions. In this section you looked at a number of features of project management that are important in the overall context of managing goals, actions, teams, results and community. Project management is essentially about managing schedules and resources. Each project goes through a life-cycle that often involves compromise. Payback is a simple and effective way to evaluate the cost-benefit of a project. Product and process projects can be classified into three areas — disruptive, innovative and incremental projects. Finally, a simple project management form can be created to share critical information about projects with individuals in a larger innovation team. These individuals are not necessarily interested in project details, but rather in information such as the impact on objectives or impact on indicators.

Projects are non-permanent goal-centred actions with a predefined start date and due date.

Some ideas grow to become resource-intensive projects.

Many projects involve changes to technology, processes, information systems, and human organisations. As such they are complex undertakings and involve many variables, risks and assumptions.
There is often ambiguity between what is a strategic objective and what is a project. Projects typically have start and end dates inside the dates of the planning horizon.

Scheduling is an important activity when leading and managing projects. There are a number of scheduling techniques, including critical path analysis, PERT and Gantt.

**Stage gate:**
The end of each stage involves a review of the project and decision on whether to proceed to the next stage.

Increased revenue and reduced costs can be collectively called 'benefit'. One can argue that every initiative must achieve a reasonable cost benefit ratio in the short or long term.

Payback is the simplest and consequently the most important method of evaluating investment alternatives.

**Section 10.10**
Self-Assessment Questions

1. Outline the key ideas behind initiative and project management
2. Explain the difference between an objective and a project
3. Outline the key stages of a project lifecycle
4. Conduct a simple cost benefit analysis for a project
5. Distinguish between disruptive, innovative and incremental projects
Section 10.11
Answers to Self-Assessment Questions

1. Understanding project goals, defining tasks and deliverables, forming a team, implementation, tracking progress, overcoming obstacles, and so on.

2. An objective is an end goal i.e. where you want to be in, say, one year's time, e.g. the top of a mountain. A project is the action you will take to achieve your objective i.e. generate ideas, experiment, test and so on e.g. plan, recruit and mount a climbing expedition to reach the top of the mountain.

3. There are many potential stages. The stages outlined earlier are: Define Problems, Gather information, Search for a number of preliminary solutions, Design Preliminary System, Evaluate and Cost the solution, Document New System, Implement New System, Manage Project activities

4. Payback = initial cost / (benefits – recurrent cost). Assume you purchase a computer to improve the efficiency of your section. You can measure such efficiency in terms of hours saved. Let's say you save 1000hrs per year. This can be converted to a benefit by multiplying by your hourly cost. You can get the initial cost of the computer from the purchase order plus any training costs involved, and the recurrent cost of the computer could be determined from any stationary or office supplies used by the new system or indeed an increase in hourly rate for a more skilled employee! You now have all of the elements to determine the payback. If the payback is more than, say, three years then you need to seriously consider whether a computer is really necessary. All projects can be analysed in terms of payback. Longer payback periods can be justified where the change is infrastructural or strategic in nature e.g. a modern telephone system.

5. Incremental projects may be where there is some small change to a system or the performance of a system. Innovative projects can create larger changes to performance and that will draw the attention of competitors and sister organisations. Disruptive projects are projects which create changes that disrupt an entire business or organisation. There is a complete change of mind sets of customers and staff.
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Section 11.1
Unit Introduction

A group of projects is called a portfolio. Most organisations have a group of projects that they are working on as part of their innovation program. These projects will have various start dates, durations, due dates and so on. A portfolio of projects is sometimes called a program or a plan.

One of the key issues in managing a portfolio is scoring and ranking of projects.

As investment budgets increase or decrease, the position of the project in the overall ranking determines whether it will be implemented or not. This section deals with some of the important issues around managing portfolios of projects. The key differences between project and portfolio management are that portfolio management involves the balancing of resources across many different projects, the achievement of organisational goals rather than individual project goals, and managing the portfolio as a whole.

Project portfolio management involves the allocation and balancing of scarce resources across projects.

Section 11.2
Unit Learning Objectives

When you have successfully completed the unit you will be able to:

- Define the concept of portfolio management
- Classify and rank projects using a number of techniques
- Explain tools such as bubble diagrams for managing a portfolio
- Rank a number of projects in a portfolio

Section 11.3
Portfolio Objectives

Portfolio management is about continuously choosing, managing and changing a portfolio of projects to match resource availability and meet organisational goals.
All projects - refer to a future state for a product, process or service. Reaching that future state involves risk and can be unpredictable. Organisations are also dynamic and goals and priorities change over time. For this reason, managing individual projects can mean losing sight of the bigger picture. Portfolio management is an approach to managing the bigger picture — managing organisational goals and actions as a whole.

There are four key approaches for portfolio management:

- Maximising Value of Portfolio
- Creating the right Mix of Projects
- Maximising Alignment with Goals
- Optimising Resources

Section 11.4
Maximising Value of Portfolio

Maximising the value of the portfolio involves placing a value on each of the projects within the portfolio.

Earlier we discussed a number of techniques for placing value on a project. Payback is a simple yet effective way to place value on a project. This approach suggests reviewing projects simply in terms of their value, say payback. The disadvantage of using payback on its own is that it excludes the non-financial benefits of a project.

An alternative approach to maximising the value of a portfolio is to include both financial and non-financial criteria.

Projects can be scored on a number of criteria, for example:
Strategic alignment, Product advantage, Market attractiveness, Ability to leverage core competencies, Technical feasibility, Reward vs. risk, Payback and so on.

Each project can, for example, be given a score sheet similar to the one illustrated in Figure11.1. On this score sheet, projects receive the score for each of the criteria along the y-axis. Each criterion has been given a weight. When the individual scores have been added up, the project receives a total score. The total scores for each project in the portfolio are then compared.

Maximising value involves placing a numeric value on each project and selecting those that have the highest number.
The ranking methodology works as follows. Each criterion has a separate row and in the top four criteria there are sub-criteria. Each criterion is assigned a weight by the individual or team. There are then five possible scores, ranging from Very Good (which is assigned 8 marks) to Very Poor (which is assigned 0 marks). The individual or team then decides how much the project scores for each particular criterion – but they are also allowed to give different portions of the project a different score for a particular criterion. Note that for the first criterion 'Fit with mission – product' the project is fully assigned to a score of very good. Note that for the criterion 'Risk level acceptability' 70% of the project is assigned a score of poor and 30% is assigned a score of very poor (or 0 marks). The level score is calculated by multiplying the % by the marks – so for the first criterion the level score becomes 1.0 x 8 and for the second example the level score becomes 0.7 x 2 + 0.3 x 0 = 1.4. The weighted score is then calculated by multiplying the level score by the criterion weight.

Learning Activity 11.1
Search Online for comments and research on the design firm IDEO (see www.ideo.com). Review what others have said about their design approach.
Record your comments in your portfolio.

Section 11.5
Creating the Right Mix of Projects

A disadvantage with the maximising value approach is that it often selects ‘blue chip' projects that have predictable but perhaps short-term and often medium benefits. A complementary approach is to develop a mix of risky and beneficial projects. Risky projects can fail, but they may also provide significant benefits.
The bubble chart is a simple tool for visualizing a mix of projects and providing decision support for managing a project portfolio (see Figure 11.2).

Creating the right mix of projects involves looking at opposing values such as risk versus benefit.

![Bubble Diagram](image)

**Figure 11.2: Bubble Diagram**

This bubble diagram maps projects according to their impact on either reward or risk. The size of the bubble in this instance represents the capital cost of the project. The position of the bubble indicates whether the project has a high or low reward, or a high or low risk. This presents the user with a visual decision support tool that allows them to rank projects in the portfolio. Each of the quadrants has been given name representing their relative meaning.

**Pearls:** These are low risk/high reward projects. Clearly, these projects are highly desirable in any portfolio of projects.

**Oysters:** These are risky projects but with potential of high reward. Sometimes the risk can be offset by the potential high reward.

**Bread and Butter:** These are often small, simple projects such as continuous improvements. They have a high likelihood of success but make a low contribution to the overall benefits of the portfolio.

**White Elephants:** These projects have low reward and high risks. It's estimated that about one third of all projects and about 25% of spending are white elephant projects i.e. although undesirable they also appear to be unavoidable in most organisations.

There are many different types of bubble diagram including:

- Risk Vs. Reward
- Technical Newness Vs. Market Newness
There are three principal variables in a two-dimensional bubble diagram — the x-axis, the y-axis and the size of the bubble. Another variable can be illustrated by changing the colour of the bubble. Some organisations also change the bubbles into ellipses which indicate, for example, probabilities. Small bubbles have high probability. Long ellipses have low probability on the long axis and higher probability on the small axis and so on.

**Learning Activity 11.2**
Review software tools by companies Microsoft and Primavera and see if they provide bubble diagrams as part of the features of their software products.
Create a bubble diagram for the projects your own organisation (or section) is currently involved in.
Place in your portfolio.

**Section 11.6**
**Maximising Alignment and Optimising Resources**

Maximising Alignment is an objective that selects projects that are aligned with particular variables such as goals, individuals, and requirements and so on. A powerful but simple technique used here is the matrix diagram. The matrix diagram places the portfolio of projects on the y-axis and a list of the other variables on the x-axis. A mark is then placed on the intersection between two variables if a relationship exists between them.

**Maximising alignment involves choosing those projects that best align with the goals of the organisation.**

Optimising Resources is the process of balancing the funding, worker-hours and skills requirements of the portfolio of projects with the resources available over a period of time.

Projects consume resources, and clearly there is often a finite amount of money available for investment. In addition, the funding available often changes. For example, if revenues are particularly low, then overall expenditure on innovation can be suddenly reduced. This can mean shelving particular low-ranked projects. The total number of worker-hours and skills available for executing projects is also finite and can vary significantly as people move
within and between organisations. A major cause of variation is the amount of time individuals have for spending on innovation activities versus their 'day-to-day' operations activities.

Optimising resources involves choosing projects on the basis of optimum allocation of resources – time, money and people.

Section 11.7
Balancing the Portfolio

Each of the four approaches discussed above can lead to a different selection and ranking of projects. Maximising Value on its own, for example, may lead to short-term, low-risk projects. A strategically aligned portfolio, on the other hand, may not yield short-term benefits which may be desirable. Portfolio managers may need to use all four approaches before deciding on the portfolio and ranking within the portfolio.

Projects and their place in the Portfolio need to be reviewed regularly.

There are two approaches for reviewing a portfolio: (i) the Gates Dominate approach and the (ii) Portfolio Dominates approach.

**Gates Dominate:** This approach focuses on reviewing each stage gate within the individual projects in the portfolio. At each stage gate, a decision is taken regarding future actions for the individual project. A regular portfolio review is sacrificed in favour of in-depth review of individual projects. The approach is suitable where portfolios are relatively static. This approach is typically found in large, mature businesses.

**Portfolio Dominates:** This approach favours a portfolio view over an in-depth review of individual projects. The portfolio as a whole and the organisational goals as a whole are reviewed regularly. The approach is particularly suitable in fast, dynamic organisations where projects are changing regularly and where the business environment is regarded as fluid i.e. goals and projects are changing regularly.

**Learning Activity 11.3**
Search the internet for tools and other resources on Project Portfolio Management.
Write notes on your key finds, and post to the class web site to share with other course participants.
Section 11.8
Classification of Projects

There are a number of additional ways to classify projects and then use the classification information to judge the relative merits of projects across a portfolio. These classifications are also useful in providing insights into the type of innovations being carried out in organisations. Figure 11.3 shows seven different classification techniques. An organisation may choose a number or all of these classification techniques for making decisions about a portfolio.

![Figure 11.3: Project Classifications](image)

Some of classifications are self-explanatory or have been discussed earlier. The ‘Systems Affected’ classification classifies the type of system affected by a project. Does the project, for example, make a major change to the information system, a business process, some technology, the organisation or a combination of all four? The ‘Type of Change’ classification indicates whether a project makes a major change to capacity, compliance, maintenance, infrastructure, performance or a combination of all five. The ‘Stage of Change’ classification distinguishes between projects which are conceptual in nature rather than say realisational. A project that involves benchmarking often results in a report rather than any physical change. This project is conceptual rather than realisational in nature. Finally, the ‘Impact Horizon’ classification indicates the more likely impact horizon for the project. Will implementation of the project achieve short-term benefits (i.e. containment), medium-term benefits (i.e. tactical) or will the organisation have to wait some time before benefits can be realised (i.e. strategic). There are many other classification techniques that can be used for managing a portfolio of projects.

Using many different classifications allows managers to decide on best mix of projects to select.
Case: ‘ThePlace2Be’ is a group of three hotels whose visitors are primarily young people. The hotel chain clearly wants to differentiate from both normal hotels and youth hostels. It has a development plan that contains a portfolio of eight major projects. The projects have been selected to offer a balance between cost-benefit, goal alignment and risk (see Figure 11.4).

![Place2Be Ltd. Bubble Diagram](image)

Figure 11.4: Place2Be Ltd. Bubble Diagram

Each of the bubbles represents a project in the portfolio. The size of the bubble represents capital cost. The higher the bubbles rise — the higher the benefit. Bubbles on the right side have higher risk of not achieving benefits.

Section 11.9
Case Study

A bubble diagram for the projects at SwitchIt Ltd. illustrates Impact versus Risk for the current project portfolio (See Figure 11.5). The ‘Restart Sports and Social Activities’ project may have a low impact on achieving our overall goals but the risk is low and other benefits will accrue.
Section 11.10
Unit Review

Organisations typically have a large number of projects. This is called a portfolio. Project portfolio management involves the allocation and balancing of scarce resources across projects.

Portfolio management is about continuously choosing, managing and changing a portfolio of projects to match resource availability and meet organisational goals.

The primary objective of portfolio management is to create a portfolio around issues such as cost-benefit, risk versus reward, and goal attainment.

One of the key issues in managing a portfolio is scoring and ranking of projects.

There are four principal approaches to managing a portfolio. There include maximizing value, maximizing alignment and optimizing resources. Maximising the value of the portfolio involves placing a value on each of the projects within the portfolio, and selecting those that have the highest number.

Projects can be scored on a number of criteria, for example: Strategic alignment, Product advantage, Market attractiveness, Ability to leverage core competencies, Technical feasibility, Reward vs. risk, Payback and so on.
Creating the right mix of projects involves looking at opposing values such as risk versus benefit.

Creating the right mix of projects can be aided by graphics such as the bubble chart and matrix diagram.

In the matrix diagram:
Maximising alignment involves choosing those projects that best align with the goals of the organisation.

Optimising resources involves choosing projects on the basis of optimum allocation of resources – time, money and people.

There are two approaches to balancing a portfolio — the gates dominate approach, and the portfolio dominates approach.

There are many other ways of helping to decide which projects or projects should be included in a portfolio, and their relative rank. In dynamic organisations where goals are changing, portfolio management is often more important than managing individual projects.

Section 11.11
Self-Assessment Questions

1. What is portfolio management?

2. What are the four key overlapping strategies used in portfolio management?

3. Name one tool that can be used for each of the four strategies.

4. In a bubble diagram of risk versus reward what are each of the four quadrants called?

5. Explain the ‘portfolio dominates’ approach to balancing a portfolio of projects.
Section 11.12
Answers to Self-Assessment Questions

1 Portfolio management means continuously choosing, managing and changing a portfolio of projects to match resource availability and meet organisational goals.

2 Maximising Value of Portfolio, Creating the right Mix of Projects, Maximising Alignment with Goals, and Optimising Resources.

3 Payback, bubble diagram, matrix diagram and resource table.

4 Pearls (low risk, high benefit), Oysters (high risk, high benefit), Bread and Butter (low risk, low benefit), White Elephants (high risk, low benefit).

5 This approach favours a portfolio view over an in-depth review of projects. The portfolio as a whole and the organisational goals as a whole are reviewed regularly. The approach is particularly suitable in fast, dynamic organisations where projects are changing regularly, and where the business environment is regarded as fluid i.e. goals and projects are changing often.
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Section 12.1
Unit Introduction

Leadership is the ability to influence a group towards the achievement of well-defined, communicated and accepted goals. Many actions occur from the bottom up, i.e. ideas are generated by engineers, specialists and users of a particular product, process or service. What stimulates this activity is a combination of leadership skills that include creating a culture of innovation, keeping the focus of the strategic goals of the organisation, empowering others to act on the goals, and resolving conflicts as soon as they arise. These skills are not easy to attain and often require many years of training and experience. Over the years, leaders will develop a specific style that can foster and promote innovation. This section looks at leadership styles that, once practised by experienced managers, can foster an innovation culture within organisations.

Leadership is the ability to influence an organisation towards the achievement of goals.

Section 12.2
Unit Learning Objectives

When you have successfully completed the unit you will be able to:

- Explain the broad characteristics of different leadership styles
- Explain how to develop some aspects of an innovation culture
- Discuss some of the key issues around conflict resolution
- Describe a number of leadership competencies important for innovation

Section 12.3
Leadership Styles

Leadership is clearly important for good innovation. What is not clear is what precisely good leadership consists of. There are many theories of leadership that have evolved out of every human pursuit from fighting wars and climbing mountains to walking on the moon and building successful organisations. The following is a list of traits identified as being important for successful leadership (Robbins 1998):

- Ambition and energy
- The desire to lead
- Honesty and integrity
It is generally agreed that good leadership requires skills in three areas: tasks, relationships and organisation.

Leadership depends on the ability to manage tasks, manage relationships within the team and with other stakeholders and equally importantly it depends on the organisation. A good leader in one organisation may not be a good leader in another. It is this latter issue — organisation and in particular how an organisation changes — that suggests that good leadership requires dynamism and the ability to change.

There are two basic types of leader: transactional and transformational

Table 12.1 illustrates two main styles of leadership — transactional and transformational (Burnes 1991). Transactional leadership is typically used in established organisations. The style emphasises attention to short-term goal attainment, the need for formal structures, problem solving, and essentially maintaining the status quo that has served the company over many years.

Transformational leadership, on the other hand, emphasises attention to long-term visions, empowerment and trust and a continuous focus on the need to change both existing products, processes and services and the innovation process itself.

Table 12.1: Leadership Styles

<table>
<thead>
<tr>
<th>Transactional Leadership</th>
<th>Transformational Leadership</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clarify goals &amp; objectives to obtain immediate results</td>
<td>Establish long-term vision</td>
</tr>
<tr>
<td>Create structure &amp; processes for control</td>
<td>Create a climate of trust</td>
</tr>
<tr>
<td>Solve problems</td>
<td>Empower people to control themselves, manage problem solving</td>
</tr>
<tr>
<td>Maintain &amp; improve the current situation</td>
<td>Change the current situation</td>
</tr>
<tr>
<td>Plan, organise &amp; control</td>
<td>Coach &amp; develop people</td>
</tr>
<tr>
<td>Guard &amp; defend the culture</td>
<td>Challenge &amp; change the culture</td>
</tr>
</tbody>
</table>

Source: adapted from: Jones, Palmer et al. 1996

Transactional leaders are often regarded as conservative bureaucrats who abide by the rules of the organisation. A transformational leader is viewed as a maverick who challenges established authority, attempts to seize every opportunity, questions every rule and motivates and controls individuals through personal loyalty.
Section 12.4
Innovation Culture

Setting goals and generating ideas are two elements of a complex environment for innovation. New ideas will only succeed if the organisational culture is right to allow them to grow and prosper.

There are many factors necessary for developing an effective innovation culture in any organisation, including the following:

- Risk-taking is encouraged and accepted
- New ideas are welcomed
- Information exchange is open and shared
- Access to new knowledge is extensive and uncontrolled
- Good ideas are supported
- Innovations are rewarded and recognised

Risk taking:

Taking risks is a necessary part of creating new ideas.

Many ideas will fail, but a few will succeed that will more than justify the entire effort. The risk-benefit analysis needs to be an integral part of the skill-set of every innovation leader. Two strategies allow leaders to lower the impact of risk — diversification and gambling. Diversification is a strategy that encourages many new ideas to be developed simultaneously. The chances are far greater that one idea will be a success. Gambling is a strategy that allows new ideas to be developed to various points where decisions around additional resources need to be taken. It is like a gambler placing low bets at the beginning of a game of cards and deciding at appropriate milestones whether to fold or make even higher bets.

Welcome new ideas:
Welcoming new ideas is consistent with the transformation management approach, where any ideas that will lead to positive change are welcomed. This is not to be confused with welcoming any ideas. Poor ideas or ideas which have an unacceptable level of risk will need to be terminated — as discussed earlier, appropriate termination of ideas is also part of the innovation process. New ideas need to be welcomed if (i) they have strategic fit and (ii) the resources are available to bring them to the next decision stage. Idea generation and termination need to be seen as the rule rather than the exception. Time needs to be allocated at all appropriate meetings for allowing new ideas to be suggested and discussed openly, and thereafter managed effectively.

Information exchange:
Information and knowledge within an organisation are the life-blood of innovation. Who is responsible for what goal? Who is working on a particular
idea? Who has skills in a particular area? Who recently visited a particular conference? Many ideas will depend on the thoughts, skills, encouragement and knowledge of a number of individuals. Leaders can encourage open information exchange through regular meetings, workshops, off-sites, email and online collaboration.

**Access to new knowledge:**
The internet has recently created an explosion in new knowledge sources.

In the past, organisations relied on expensive libraries, subscription to a few magazines and trips to conferences and trade shows. New knowledge is the raw material for creative thought.

**Access to new knowledge needs to take place within an environment where goals are well defined and understood.**

There are many techniques used for capturing and sharing new knowledge, including creating internal libraries, visiting trade shows and conferences, building communities of practice with other like-minded people, using the library and internet, attending training seminars and University courses, and so on.

**Learning Activity 12.1**
Search Online: http://www.wikipedia.org/ and look up Learning, Online Learning. Search the internet for Open Source Learning, the learning organization.

How does your organisation support employees to learn? Suggest ways to improve this, based on your internet search.

Discuss online on the course forum.

**Support for ideas:**
Ideas and the individuals who create them are like young seedlings — if they do not receive support and encouragement, they can wither and die. Innovation leaders need to learn how to support ideas and protect the often delicate sensitivities of the individuals who create them. Innovation leaders play a number of important roles in this process. Firstly, they receive the idea sensitively and encourage its development during its initial growth stage. As the idea grows, so too will its demand for more resources and its impact on other managers. Innovation leaders often need to defend and promote ideas with their peers within the organisation and if necessary sell the idea to more senior management teams and boards.

**Reward and recognition:**
Innovation and creativity demand appropriate reward and recognition not only for the individual or team that creates and develops an idea, but also for the innovation process itself i.e. to spawn and encourage new ideas. Creative energy is easily dissipated. Reward and recognition replenishes this energy in the minds of individuals.
Rewards can be either intrinsic (e.g. self actualisation) or extrinsic (e.g. a bonus). Both are interlinked.

Intrinsic rewards include:
- Recognition through say an announcement
- Control, where the innovator continues to be a part of the idea as it is implemented
- Celebration e.g. throwing a party
- Rejuvenation e.g. providing time off

Extrinsic rewards include:
- Cash bonus
- Larger than normal pay increment
- Share options

A key issue is to not allow extrinsic rewards to overshadow the intrinsic rewards which are often more meaningful and satisfying to individuals.

**Learning Activity 12.2**
Write a short note on what type of reward system your organisation has in place.
What sort of rewards do you respond to by increasing effort and output?
Give real-life examples.
Can you suggest improvements to your organisation's reward system which are feasible in terms of cost, and would be more motivating for employees?
Add to your portfolio.

**Case:** William Hewlett and David Packard created an open and decentralised Hewlett-Packard corporation that prides itself on innovation and creativity. The open culture encouraged new ideas and allowed the company to become world leaders across a range of products. When the founders retired in 1990 the company was becoming more centralised and bureaucratic — perhaps the inevitable result of becoming so large and successful around the world. Innovators found that they needed to get approval for new ideas from many layers of management and received much less moral support to continue working on the new ideas. The result was a marked slowdown in new product introductions, and falling profits. Hewlett and Packard returned from retirement and broke up the bureaucratic mess. They reintroduced a positive environment for ideas and risk taking. The result was that new product introductions increased as did profits.
Section 12.5  
Conflict Management

Diversity is an important attribute of an innovative team. It fosters creative friction between individuals that spurs on new ideas and goal attainment. However, this friction can also lead to conflict, and the purpose of a leader is to make this conflict positive. Table 12.2 outlines nine conflict management strategies for dealing with negative conflicts.

Table 12.2: Conflict Management Techniques

<table>
<thead>
<tr>
<th>Technique</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Problem Solving</td>
<td>Face-to-face meeting for identifying problem &amp; resolving it through open discussion</td>
</tr>
<tr>
<td>Superordinate Goals</td>
<td>Creating shared goal that cannot be achieved without co-operation of each of the conflicting parties</td>
</tr>
<tr>
<td>Expansion of Resources</td>
<td>If conflict is caused by lack of resources e.g. money, expansion of resources creates a win-win solution</td>
</tr>
<tr>
<td>Avoidance</td>
<td>Withdrawal from, or suppression of, the conflict</td>
</tr>
<tr>
<td>Smoothing</td>
<td>Playing down differences while emphasising common interests between conflicting parties</td>
</tr>
<tr>
<td>Compromise</td>
<td>Each party to the conflict gives up something of value</td>
</tr>
<tr>
<td>Authoritative Command</td>
<td>Management uses its formal authority to resolve the conflict &amp; then communicates its desire to the parties</td>
</tr>
<tr>
<td>Altering the Human Variable</td>
<td>Using behavioural change techniques, i.e. HR training, to alter attitudes &amp; behaviour that can cause conflict</td>
</tr>
<tr>
<td>Altering Structural Variables</td>
<td>Changing formal organisation structure &amp; interaction patterns of conflicting parties through job design, transfer, creation of coordination positions, etc.</td>
</tr>
</tbody>
</table>

(adapted from Robbins 1998)

The first and perhaps most widely-used technique is problem solving. The others offer varying approaches to resolving and even avoiding conflicts before they arise. The problem-solving technique can be described as comprising three steps:

- Creating the right climate
- Facilitating discussions
- Closure
Creating the right climate for a team includes creating a climate where obstacles and other problems can be identified and discussed as soon as they arise. Each member of the team needs to be encouraged to bring issues out without fear of recrimination. This includes interpersonal issues with other members of the team. When issues are raised, the team leader needs to facilitate the discussion by keeping it impersonal, encouraging each person involved to express their views and constantly referring back to the objectives and goals of the team. Closure involves closing down the issue by suggesting what actions need to be taken next. If the discussion has become too sensitive or perhaps is leading nowhere, then it should be parked and revisited later when people have had time to consider alternative solutions.

Conflict management is also about creating positive conflict. In the past, many leaders evolved because they were conflict evaders, but innovative organisations now actively encourage conflict and constructive criticism. Many successful business companies now encourage a free flow of information within their organisation, criticisms or otherwise. A third party council can be provided for any disputes that may arise. This form of conflict management has been proven successful, stimulating new ideas and allowing for continuous improvement in the organisation.

Create a team climate where obstacles and other problems can be identified and discussed as soon as they arise

Section 12.6
Empowerment and Responsibility

Empowerment is about giving individuals the necessary power to make appropriate decisions.

Empowerment is similar to delegation in that it increases autonomy and discretion in individuals and leads not only to more effective innovation but also better job satisfaction. Autonomy and discretion together are one of six psychological job criteria identified that empower individuals and lead to better job satisfaction. The full list of criteria are (Pava 1983):

- Autonomy and discretion
- Sense of meaningful contribution
- Opportunity to learn and continue learning on the job
• Optimal variety
• Opportunity to exchange help and respect
• Prospect of a meaningful future

Empowered individuals want not only an appropriate increase in autonomy and discretion, but they also need to feel that their contribution is meaningful. They want the option of continuing to learn on the job, i.e. increase their enablement, which in turn can lead to more empowerment.

Empowered individuals want optimal variety in their job tasks and they would like the opportunity to exchange help and respect with colleagues. Finally, empowered individuals need to know that they have the prospect of a meaningful future with the organisation.

We saw earlier that empowerment or the discretion to take decisions needs to be appropriately balanced with enablement i.e. the ability and skills to take decisions. If that enablement is not present in the individual, then it needs to be supported through training and experience.

One of the first steps in empowering individuals is to assign responsibility for something i.e. put their name on a particular task or goal and ask them to take ownership. The level of ownership can vary considerably. Putting their name of a particular goal may mean that if the goal is not met then they are held personally responsible. On the other hand, they may simply be responsible for reporting to the organisation the status of the goal. They may have responsibility for communicating the goal to other individuals and collecting information on how the goal is progressing. The level of responsibility needs to be worked out in advance.

Empowering individuals includes giving them responsibility for something.

Section 12.7
Leadership Competencies

We will conclude this unit on Innovation Leadership by looking at a set of competencies for effective leadership. These have been gathered from a number of sources (Jones, Palmer et al. 1996).

1. Listen carefully to others
2. Give people responsibility for tasks and projects
3. Challenge the rules and conventions in the organisation
4. Have a clear vision for the team
5. Have a clear perception of personal strengths and weaknesses
6. Encourage ideas from the team
7. Demonstrate trust to others
8 Anticipate and adapt to changing conditions
9 Communicate the vision and ideas clearly
10 Spend time keeping up to date and developing new skills
11 Motivate and encourage others
12 Provide training to enable people to work effectively
13 Help others to manage change
14 Demonstrate a high level of commitment to work
15 Manage time well
16 Develop a good communication network throughout the organisation
17 Provide support for people where needed
18 Manage stress well
19 Focus on achieving results
20 Have a positive attitude

These leadership competencies are numbered and can be grouped to support five core traits — Listening, Empowering, Adapting, Delivering and Self-understanding.

The number of the competency is printed beside the relevant trait below:

Listening (1,6,11,16): This is one of the most critical aspects of leadership, as subordinates will respond much better if they feel that they are being listened to and have actual input in a process. Listening is linked to understanding that is the basis for employee motivation. If employees feel free to suggest ideas without the possibility of being dismissed or ignored, this provides the organisation with a huge network of new perspectives which may improve the firm.

Empowering (2,7,12,17): This allows the leaders to give up certain areas of power, thus allowing them the space to truly lead. Within modern organisational structure, empowerment and the ability to lead empowerment projects are essential.

Adapting (3,8,13,18): This also refers to challenging the accepted norms of the organisation and pushing the boundaries of accepted situations. In this period of continuous change, leaders must adapt to circumstances as they arrive.

Delivering (4,9,14,19): This refers to delivery of the organisation's vision and demonstrating complete commitment to its attainment. These are important elements of leadership. It is through organisation and motivation of teams by a leader that actual results are delivered.

Self-understanding (5,10,15,20): This is also crucial so that leaders can recognise their skills and focus on acquiring the other capabilities required to be an effective leader. A leader must demonstrate ‘soft’ skills, such as coaching, as well as ‘hard’ skills, such as displaying competency with technology. Leaders have to demonstrate a positive attitude towards themselves and their work.
**Section 12.8**

**Case Study**

The skills or training programmes adopted by the innovation team at SwitchIt Ltd. are illustrated in Table 12.3. One new skill has been added this year – ‘Delegating to Others’ and a customised course for this is currently being developed by a sub contractor.

<table>
<thead>
<tr>
<th>Skills</th>
<th>Group</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal</td>
<td>Managing Time</td>
<td></td>
</tr>
<tr>
<td>Personal</td>
<td>Negotiation Skills</td>
<td></td>
</tr>
<tr>
<td>Personal</td>
<td>Communication and presentation</td>
<td></td>
</tr>
<tr>
<td>Personal</td>
<td>Project management</td>
<td></td>
</tr>
<tr>
<td>Interpersonal</td>
<td>Managing conflict</td>
<td></td>
</tr>
<tr>
<td>Management</td>
<td>Innovation Management</td>
<td></td>
</tr>
<tr>
<td>Personal</td>
<td>Leadership</td>
<td></td>
</tr>
<tr>
<td>Interpersonal</td>
<td>Delegating to others</td>
<td></td>
</tr>
<tr>
<td>Management</td>
<td>Monitoring Performance</td>
<td></td>
</tr>
<tr>
<td>...</td>
<td>...</td>
<td></td>
</tr>
</tbody>
</table>

The relationships between skills and individuals on the team are illustrated in Figure 12.1. The dark-shaded cells indicate courses competed. The light-shaded cells indicate that a course is planned.

**Figure 12.1**: Relationships between Individuals and Skills
Section 12.9
Unit Review

Leadership is the ability to influence an organisation towards the achievement of goals.

It is generally agreed that good leadership requires skills in three areas: tasks, relationships and organisation.

There are two basic types of leader: transactional and transformational.

Innovation leaders are driven by vision, ambition and energy. They are transformational, prepared to take risks and constantly change the status quo.

Innovation leaders foster a culture of innovation within the organisation that encourages appropriate risk taking, welcomes new ideas, shares information openly, provides extensive, uncontrolled access to new knowledge, supports good ideas, and recognises and rewards the contributions of individuals.

Taking risks is a necessary part of creating new ideas.

Access to new knowledge needs to take place within an environment where goals are well-defined and understood.

Rewards can be either intrinsic (e.g. self actualisation) or extrinsic (e.g. a bonus). Both are interlinked.

Conflict provides a creative friction between individuals but needs to be carefully managed so that it remains positive. Innovation leaders are equipped with the skills to manage conflict that include facilitation and task management. It is important to create a team climate where obstacles and other problems can be identified and discussed as soon as they arise.

Each individual in the organisation has needs and desires that motivate them into taking risks and generating ideas. A good innovation leader understands the criteria that drive an individual which include the need for autonomy and discretion, and optimal variety of work tasks. Empowerment is about giving individuals the necessary power to make appropriate decisions.

Empowering individuals includes giving them responsibility for something.

The unit identified five key leadership competencies — Listening, Empowering, Adapting, Delivering and Self-understanding.
Section 12.10
Self-Assessment Questions

1. Why is transformation leadership more desirable for effective innovation?

2. List six key factors for fostering an innovation culture in any organisation.

3. Explain in your own words a problem solving technique used for conflict management.

4. There are 20 leadership competencies listed in this section which contribute to creating an innovation culture. How many of them can you recall? Try listing them here, then go back over the list again to refresh you memory.
Section 12.11
Answers to Self-Assessment Questions

1. Innovation is about making changes to something established by introducing something new. Transformation leadership is about encouraging change in every aspect of the organisation.

2. 1. Risk taking is encouraged and accepted
    2. New ideas are welcomed
    3. Information exchange is open and shared
    4. Access to new knowledge is extensive and uncontrolled
    5. Good ideas are supported
    6. Innovations are rewarded and recognised

3. There are various ways you can answer this question, based on content in the unit and on your internet search. Here is a sample answer on the problem-solving process used for conflict management. Your answer should cover some of these points:

   • Determine how important the issue is to all people involved.
   • Determine if all people involved are willing and able to discuss the issue in a positive manner.
   • Select a private place where the issue can be discussed confidently by everyone involved.
   • Make sure that both sides understand that they are responsible for both the problem and the solution.
   • Solicit open comments from both sides. Let them express their concerns, feelings, ideas, and thoughts, but in a non-accusatory manner.
   • Guide participants toward a clear and specific definition of the problem.
   • Encourage participants to propose solutions. Examine the problem from a variety of different perspectives and discuss any and all solutions proposed.
   • Evaluate the costs verses the gains (cost-benefit analysis) of all proposed solutions and discuss them openly. Choose the best solution.
   • Reflect on the issue and discuss the conflict resolution process.
• Encourage participants to express their opinions as to how the process may be improved.

4 Check your answer to this question in the text.
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Section 13.1
Unit Introduction

Most organisations now operate a type of matrix organisational structure where individuals report on a permanent basis to functional departments but also report on a temporary basis to project organisations. Functional departments are examples of permanent teams. Once they are formed and structured, they can last for many years. Project organisations, on the other hand, are non-permanent teams. Project organisations only last for the duration of the project. The Innovation process requires both types of teams. The terms ‘team’ and ‘organisation’ are interchangeable. This section looks at teams and how they are used to stimulate, plan, execute and control an innovation plan.

Departments are examples of permanent teams; they can also be innovation teams.

Section 13.2
Unit Learning Objectives

When you have successfully completed the unit you will be able to:

- Define teams
- List the successful traits of highly effective teams
- Describe the different types of team in an organisation
- Explain the differences between empowerment and enablement
- Discuss issues around interpersonal communications in teams

Section 13.3
Defining Teams

A team is a group of people with a common purpose. This common purpose is typically expressed by a set of goals.

There are two types of teams — permanent and non-permanent.

Management teams, departments, committees and work groups are examples of permanent teams. Permanent teams don’t change significantly over a long period of time. Projects, on the other hand, are an example of a non-permanent team. They have a start date and end date defined by the project to be executed. Each time a non-permanent team forms to execute a particular initiative, it has an entirely new set of goals. As you learned earlier, each new
A number of common traits can be identified for an effective permanent or non-permanent team.

These have been compiled from a number of sources including (Majchrzak 1988) and (Pava 1983):

- Common goals
- Enablement
- Empowerment
- Structured meetings
- Mutual accountability
- Mutual Trust
- Effective leaders
- Equitable reward and recognition

An effective team has well-defined goals. All members of the team feel a common ownership for achieving these goals. The team is enabled to achieve these goals — they have the right mix of skills and know-how to achieve their goals. An effective team is also empowered to achieve these goals. They understand the level of their power in making any necessary decisions. Effective teams are well managed e.g. they have regular and well-structured meetings. There is mutual accountability and trust among members of the team, and an expectation that conflicts can be resolved in the interests of the common good. Effective teams have effective team leaders who are capable of motivating and engaging team members, resolving conflicts and keeping the focus on common goals. Effective teams are ones whose members experience equitable reward and recognition. Each member of the team feels that their efforts are recognised.

Section 13.4
Innovative Organisations

Innovation is often seen as an individual act, where one person creates an idea and perhaps another validates and implements the idea. Most innovations, however, are the result of group or team behaviour. Teams can create greater innovation because they bring together different competencies, insights and perspectives. Team composition means a diversity of thinking styles and skills. This diversity has a number of advantages:

- Diversity creates creative friction between individuals that sparks new ideas.
• Diversity is a safeguard against groupthink where a group of individuals has a tendency over time to allow their thinking to converge.
• Diversity creates an environment where different perspectives are developed and where good ideas can be identified and supported.

Innovative organisations have high employee involvement in teams.

The attributes of such organisations include:

• Employee involvement ‘policy’
• Clear organisational strategy towards involvement
• Formal measures of ‘involvement’
• Internal consulting staff
• Team champions
• Large training activity
• External consultants

Innovative organisations have a formal policy for engaging employees in teams and regularly create strategic objectives whose aims are to enhance involvement. They have formal measures of team involvement such as how many ideas are being generated and how much time is being spent on project activities by individuals. Innovative organisations often have internal consulting staff that can consult and train various teams in an effort to increase effectiveness and participation. Team champions or mentors who are often senior members in the organisation are assigned to teams and can act in the interests of the team at senior board meetings.

Innovative organisations have a large training activity and use external consultants for training and facilitation on various team-building activities.

Section 13.5
Team Structure

The structure and behaviour of the team is an important part of the innovation process.

The structure of a team can represent a wide cross-section of functions and disciplines in the organisation.

Multiple disciplines are necessary because no single type of skill provides the systems knowledge necessary to implement the wide variety of actions that
will be executed. However, multiple disciplines and a wide variety of skills within the organisation can have a tendency to increase the size of teams to a point where they become difficult to manage.

There are a number of strategies for limiting the number of participants in a team:

1. Tier membership
2. Stage membership
3. Specialist subgroups

Teams with a large number of participants may be divided into two tiers. One tier may be concerned with steering the organisation and involve relatively senior members. The second tier may be concerned with executing the various tasks of the organisation and mainly involve specialists and users. A senior manager can liaise between both groups. Stage membership involves only engaging certain individuals for a particular stage in the project. They can be called into the team when a particular stage begins, and leave when the stage is complete. Teams may also be divided into specialist subgroups that are responsible for executing special parts of the team’s functions. The leader of the specialist’s subgroup would again act as the liaison between the subgroup and the main team.

Section 13.6
Project Teams

There are many different types of team for executing an initiative or project.

The type of team depends on the scope and definition of the task.

For example, a project that involves the replacement of computers may be populated exclusively by computer specialists from one function or department. On the other hand, if the task is to develop a new business process, then the team will typically involve managers and specialists from a number of functions.

In general there are four types of project team:

1. Functional organisation
2. Lightweight project manager
3. Heavyweight project manager
4. Tiger team organisation

Source: Wheelwright 1992

(see Figure 13.1).
Functional organisation: This type of project team is typically populated by members from the same function or department. If a number of functions are involved in a project, then a specialist subgroup would be set up for each function. Coordination between the subgroups would be done by the next highest functional manager in the hierarchy. This organisation encourages projects to be divided in two phases where one function completes each phase and delivers the results to the next function at the end of the phase. This is often referred to as an 'over the wall' approach i.e. each function does not care much about what happens in the project once their particular task is complete and their results have been passed on to the next function. Functional organisation teams are typically deployed where a project has a significant functional requirement e.g. replacing computer hardware.

Lightweight project manager: This project team has a project manager who coordinates the activities of individuals from different functions. The level of empowerment of the project manager is low. The main decision-making power regarding the activities of the various individuals involved resides with the functional managers. The project manager typically has low status within the organisation. He or she is often a functional specialist (e.g. an engineer or systems analyst) and the project has a significant functional requirement. Lightweight project manager teams are typically deployed where the project has a large requirement from one function but also requires participation from other functions e.g. installing a new computer system in the sales office.

Heavyweight project manager: This project manager has significant power and authority for leading what is a significant project for the organisation. Members of the team are effectively seconded from their functions into the project on project-related issues and report directly to the project manager. The project manager typically has senior status within the organisation, and appropriate experience and skills for taking the necessary decisions in reaching the goals of the project. Heavyweight project manager teams are typically
deployed where the project requires significant input from a number of functions e.g. designing a new process for the sales office that includes computer systems, application software, training, and so on.

**Tiger team organisation:** This team removes individuals temporarily from their functions and makes them exclusively responsible to the project manager for the duration of the project on all issues related to their role in the organisation. This team also typically resides in the same office environment to allow complete dedication to achieving the project’s goals.

Tiger team organisation teams are deployed for projects which have a strategic significance for the organisation and require a significant investment in time, money and people.

An example of such a project would include designing and installing a new manufacturing facility for a newly innovated and radically different product from the existing product family.

Each of these project teams is more or less appropriate for different projects. Not every project can attract the resources of a heavyweight project manager. There are simply too many projects in an organisation to be executed. Heavyweight project manager structures are important when the impact of the project crosses a number of functional boundaries and where the project is strategically important for the organisation. Tiger team organisations are used for extremely important, resource intensive and high risk projects—typically those that involve disruptions to current business practice. The functional organisation team is very common where the projects are relatively specialised round one function. There are often a large number of projects in any organisation whose goals can be executed by one functional department. Various product design projects, computer technology projects and engineering projects are managed and executed by the respective functions or departments.

**Section 13.7**  
Empowerment and Enablement

A key issue in teams is achieving the correct balance between empowerment and enablement.

Enablement is the ability of the team and individuals within the team to execute the tasks of the project. Enablement represents the combined skills and knowledge of each individual in the team. Empowerment is the amount of authority and discretion that the team has for taking the necessary decisions to execute project activities. There are four possible scenarios in the balance between empowerment and enablement – see Figure 13.2.
Teams with low enablement (e.g. skills) and low empowerment (e.g. decision-making power) are weak. They can be referred to as occupying ‘entrenched bunkers’. They’re both incapable of making changes and also highly resistant to change. Giving this team more power (i.e. higher empowerment) only turns them into ‘loose cannons’. They have the power to make decisions but they do not have the skills to make the right decisions. A team with the right skills (i.e. high enablement) but who also have a low empowerment are referred to as ‘caged eagles’. They know what needs to be done and have the skills to do it but they do not have the necessary decision-making power. This team is often frustrated.

Full empowerment is reached when the team reaches high enablement and high empowerment.

A key goal for every organisation is to determine the correct mix of empowerment versus enablement for each individual project.

Learning Activity 13.1
Search Online for useful resources for Management Team Building. Write a brief note on the three best sources you find. Include the URLs and a brief description of the resource. Share these with other course participants on the course discussion forum.

Section 13.8
Team Communications

Communications between members of a team is a key factor in generating ideas, solving problems and executing common tasks efficiently. Poor communications is a major barrier to achieving the goals of the organisation.
Two factors are important in opening up communications and allowing for a free flow of thoughts and ideas:

1. sending and receiving messages, and
2. openness and consideration.

**Sending and receiving messages:** In every communication there is a sender and a receiver. Every message needs to be constructed and sent by the sender, and then received and deconstructed by the receiver. There are a large number of ways that this process can go wrong, i.e. where the intended message is not the one received. When the process is repeated many times as in a short conversation, the chances of unintentional error increase dramatically. Reflect on the number of times you have found yourself observing two people who talked with each other as if disagreeing, but were in fact ‘saying the same thing’ in your opinion. There are many reasons for these problems, including personality clashes, unresolved conflicts from the past, or simply misreading the intended communication.

Research can demonstrate that a message communicated between two people is composed of the following elements:

- 7% Words
- 38% Verbal Expression
- 55% Facial Expression

In other words, we look for cues to the meaning of the message mainly from verbal and facial expressions.

Consider the sentence ‘What are you doing?’ It can clearly be positive, neutral or negative in the mind of the receiver. A calm voice and friendly facial expression makes the communication positive and non-confrontational and much more likely to receive a positive response. The same sentence said with a harsh voice and frowning or agitated expression would appear as negative, and is more likely to receive a defensive response.

**Openness and consideration:** We saw earlier that ‘lying low’ in a meeting can be used consciously or unconsciously as a counter implementation game. There are a number of other important facets to this stance, and these can be explored by considering the openness and consideration used in communication.
Figure 13.3: Openness and Consideration

The level of openness and consideration used by individuals in a communication is illustrated in Figure 13.3. Individuals with low openness and low consideration have a ‘concealed aggressive’ communication. These individuals often lie low and then suddenly burst into a communication in an aggressive way i.e. with low consideration for others. Individuals with low openness and high consideration are ‘passive’. These individuals also lie low but rarely contradict or challenge an idea. Individuals with high openness and no consideration are ‘openly aggressive’. These individuals are not afraid to say what they think but are inconsiderate to the views of others. Finally, individuals with high openness and high consideration are ‘assertive’. These individuals speak their mind but are also considerate and mindful of the views of others.

Speak your mind but also be considerate of the views of others

Section 13.9
Case Study

SwitchIt Ltd. has a number of teams. The Innovation Team which has overall responsibility for innovation is led by the general manager. Each project has a project team with a project leader who takes responsibility for managing the project and communicating results to the innovation team. There are other teams such as a cross-functional team for organising the social club, department teams, assembly-line workgroups or teams, and so on. Each team has someone responsible for managing the goals, actions and results of the team’s common purpose. A simple relationship matrix can illustrate all of the teams, who is responsible and who is a member of each team. All individuals at SwitchIt Ltd. are encouraged to be a permanent member of a team. Hourly paid or blue collar workers are allowed up to 15% of their time per week to participate in team activities — attending meetings, discussing goals, results and so on.
Section 13.10
Unit Review

Each organisation consists of permanent and non-permanent teams. The organisation used in your activities is an example of a permanent team.

Individuals in this organisation can also be members of project teams which are non-permanent.

Teams have a number of attributes, but in particular they are a group of individuals with a common purpose. This common purpose is typically expressed by a set of goals.

A number of common traits can be identified for an effective permanent or non-permanent team:

- Common goals
- Enablement
- Empowerment
- Structured meetings
- Mutual accountability
- Mutual Trust
- Effective leaders
- Equitable reward and recognition

Innovative organisations have high employee involvement in teams.

Innovative organisations have a large training activity and use external consultants for training and facilitation on various team-building activities.

There are a number of strategies for limiting the number of participants in a team:

1. tier membership
2. stage membership
3. specialist subgroups

The type of team depends on the scope and definition of the task.

In general there are four types of project team:

1. Functional organisation
2. Lightweight project manager
3. Heavyweight project manager
4. Tiger team organisation
Tiger team organisation teams are deployed for projects which have a strategic significance for the organisation and require a significant investment in time, money and people.

Effective teams depend on a number of factors such as effective communications, empowerment, enablement and structure.

A key issue in teams is achieving the correct balance between empowerment and enablement.

The structure of a team can represent a wide cross-section of functions and disciplines in the organisation.

Full empowerment is reached when the team reaches high enablement and high empowerment.

A key goal for every organisation is to determine the correct mix of empowerment versus enablement for each individual project.

Effective communications requires us to identify when members of the team are beginning to adopt stances such as 'lying low', with the risk of concealed aggression or simply not participating.

It is important to speak your mind but also be considerate of the views of others.

Section 13.11
Self-Assessment Questions

1 What is a team?

2 List the traits of highly-effective teams.

3 What are the attributes of innovative organisations for creating successful teams?

4 Name the four different types of teams that can be used for managing projects or projects.

5 Explain the difference between someone who would be regarded as fully empowered and someone who would be regarded as assertive.

6 Use a diagram to explain how issues of openness and consideration affect communications in teams.
Section 13.12
Answers to Self-Assessment Questions

1. A team is a group of people with a common purpose, a set of common goals.

2. Traits of highly-effective teams:
   - Common goals
   - Enablement
   - Empowerment
   - Structured meetings
   - Mutual accountability
   - Mutual trust
   - Effective leaders
   - Equitable reward and recognition

3. Innovative organisations have:
   1. an employee involvement ‘policy’
   2. clear organisational strategy towards involvement
   3. formal measures of 'involvement'
   4. internal consulting staff
   5. team champions
   6. large training activity
   7. external consultants

4. • Functional organisation
   • Lightweight project manager
   • Heavyweight project manager
   • Tiger team organisation

5. An individual who is fully empowered is regarded as having a high level of enablement (e.g. skills) and a high level of empowerment (e.g. decision-making power). An individual who is assertive is regarded as having a high openness to communication and a high consideration for the views of others.

6. The level of openness and consideration used by individuals in a communication is illustrated in Figure 13.3. Individuals with low openness and low consideration have a ‘concealed aggressive’ communication. These individuals often lie low and then suddenly burst into a communication in an aggressive way i.e. with low consideration for others. Individuals with low openness and high consideration are ‘passive’. These individuals also lie low, but rarely contradict or challenge an idea. Individuals with high openness and no consideration are ‘openly aggressive’. These individuals are not afraid to say what they think but are inconsiderate to the views of others.
People who are neither open nor considerate may burst out with a statement that raises other people's anger. They are not considerate about other people's reactions. Passive people are inclined to stay silent, letting others do the talking even though they might not agree with the point being made. People who are open and inconsiderate may alienate others by their abrasive interventions. Assertive people make their views known clearly, but in a way that takes other people's feelings and views into consideration.
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Motivating Performance

Section 14.1
Unit Introduction

One of the most practical ways of tying individuals into the innovation process is to link their personal performance with the performance of the organisation. The performance of the organisation is articulated through such goals as strategic objectives, performance indicators and meeting stakeholder requirements. If the individual is made responsible for achieving these goals, this can act both as a motivator, and later on as one of their performance appraisal mechanisms. There are many intrinsic and extrinsic means of motivating individual performance. Intrinsic techniques, such as giving the individual autonomy and discretion and the chance of self-actualising, are generally deemed the most productive. Extrinsic techniques such as linking performance to pay and other rewards are also necessary to incentivise the individual, take them out of their comfort zone and help them take more risks for the organisation. This section looks at motivation, and in particular at a number of techniques for providing extrinsic rewards for individuals and teams.

Individuals can be motivated by having responsibility for achieving goals and later being measured as part of a performance appraisal mechanism.

Section 14.2
Unit Learning Objectives

When you have successfully completed the unit you will be able to:

- Explain the difference between intrinsic and extrinsic motivation
- Outline the process of using gain-sharing to link team performance to organisational performance
- Explain the profit-sharing approach to the motivation of individuals and teams
- Design a simple performance appraisal system for individual motivation and performance

Section 14.3
Motivation

Employee motivation is clearly essential for achieving organisational objectives.

There are two types of motivation — intrinsic and extrinsic.
Intrinsic motivation is motivation that comes mainly from within the individual, such as having a meaningful job that stimulates and satisfies their intellectual capability. Extrinsic motivation comes mainly from outside the individual, and includes such factors as level of pay, bonuses and other recognition projects.

Intrinsic motivation has long been recognised as a more powerful and potent motivational force. Money, on the other hand, is losing its force as a motivational factor. As living standards rise, individuals are becoming increasingly affluent and well educated, and this makes money less valuable in helping them achieve a sense of meaningful purpose. Maslow presents a very succinct way to illustrate these ideas. He has created the so-called hierarchy of human needs (Maslow 1954).

Intrinsic motivation has long been recognised as a powerful and potent motivational force.

Maslow’s hierarchy divides human needs into five areas, with physiological lowest:

- Physiological Needs
- Safety Needs
- Social Needs
- Ego or Esteem Needs
- Self-fulfilment Needs

Maslow has identified that needs only become motivators when they are left unsatisfied.

When one need is satisfied, the need for the next higher level in the hierarchy replaces it. For example, typical physiological needs include food and water — we need them to live. When this hunger is satisfied our needs change to safety needs — for example we need a safe place to live. When both these needs are satisfied, they are replaced by social needs (e.g. the need to be loved) and so the movement up the hierarchy continues. Most of us have needs right up to the highest level in the hierarchy i.e. self-fulfilment needs. Self-fulfilment needs include the feeling that our professional lives are fulfilled. Maslow’s insights touch on a number of concepts discussed earlier, including empowerment and enablement and the psychological job criteria that identify such issues as the need for optimal variety and more discretion in our jobs.
Section 14.4
Extrinsic Motivation

Intrinsic motivation that comes from within the individual and such factors as self-actualisation are clearly important, however a number of forces act against this and require extrinsic motivation. Forces that act against exclusively intrinsic motivation include:

- Individuals are risk adverse, loss averse, and tend to remain content rather than stretch their efforts.
- Individuals need to see a clear link between their effort and the resulting performance, between performance and reward, and between the form of reward and what they value.
- Individuals already receiving a guaranteed reward in return for reasonable performance are unlikely to stretch further in terms of levels of time commitment, effort, and risk-taking to achieve a relatively small and uncertain additional reward.

To counteract these forces, extrinsic motivation remains present in most innovative organisations. There are three principal techniques used for providing extrinsic motivation and linking reward with performance:

- Gain-Sharing,
- Profit-Sharing and
- Performance Appraisal

The ideal scenario for many organisations is to maximise the factors that provide intrinsic motivation and optimise extrinsic-based systems.

Section 14.5
Gain-Sharing

Gain-sharing is a group bonus scheme where the entire organisation share in the benefits that result from improved innovation.

The system links remuneration to organisational performance, rather than individual performance. Organisational growth is the primary objective. When growth occurs, individuals benefit as a whole through a cash bonus. Because gain-sharing is shared across the organisation, there is less competition among team members. On the other hand, some individuals may receive reward for very little effort. In addition, the system promotes all individuals to operate at a similar level of productivity i.e. highly productive individuals may reduce their overall effort. Overall, the system promotes team-work and a more pragmatic sharing of reward.
Learning Activity 14.1
Search Online for a number of organisations that provide solutions for deploying Gainsharing in companies, and review their methodology. How does this compare with practices in your own organisation? What form of reward do you find most motivating and why?

Gain-sharing uses a formula that is simple to understand and easily related to growth — productivity or profitability.

A successful gain-sharing program relies on two objectives:

- the formula
- training on how to improve benefits

The formula needs to be based on a careful examination of the company's past performance. Factors such as productivity, quality, cost of worker's compensation, reduction in lead-times, and so on can be used in developing a relevant formula.

An example of a gain-sharing formula: 'if workers keep labour costs below 12 per cent of sales, they get a bonus amounting to the difference between actual labour costs and the twelve per cent target'.

Gain-sharing formulas must be kept simple and understandable to individuals.

Benefits that are commonly attributed to gain-sharing include (Lawler 1992):

- Co-ordination, teamwork, and sharing of knowledge
- Social needs are recognised via participation and mutual reinforcing of group behaviour
- Attention is focused on goals such as performance indicators
- Acceptance of change due to technology, market, and new methods is greater
- Individuals demand better performance from each other
- Increased innovation
- Where unions are present, union-management relations become more flexible
There are four critical components to developing a successful gain-sharing plan:

- Management commitment
- Employee involvement
- Structures
- Communication

Source: Smyth 1999

**Management commitment:** Management must wholeheartedly support the plan. They must also work to develop a company culture of respect, open communication and co-operation. Management must give individuals and teams the power to change their jobs so that they can realise innovation gains.

**Individual involvement:** Teams must have a variety of ways of sharing information, tackling problems and monitoring results that focus on individual requirements. This includes training on personal skills, interpersonal skills and technical or management skills.

**Structures:** Structures must be put in place that facilitate and encourage individuals to participate in the innovation process i.e. idea generation, problem solving, team participation, and results monitoring. Structures include meetings, teams, regular training, procedures, and so on.

**Communication:** Information that traditionally belonged to management must be shared with everyone, e.g. news of upcoming orders, customer opinions about products and quality results. Feedback on organisational performance and internal difficulties is also an important part of any gain-sharing plan.

**Section 14.6**
**Profit-Sharing**

Profit-sharing is an incentive plan that pays bonuses based exclusively on profits as opposed to growth in, say, productivity or market share.

The plan is at least partially share-based and gives individuals the potential for high rewards if the company thrives. Profit-sharing schemes can develop a sense of ownership among individuals, which in turn brings the benefits of increased employee motivation, productivity and performance.

Profit-sharing and gain-sharing differ in that gain-sharing holds employees accountable for a few key expenses that they can control (e.g. material costs, output, etc.) and it is generally paid out on a monthly basis. Profit-sharing, on the other hand, holds employees accountable for elements they cannot control (e.g. market fluctuations), and is generally paid on a five-yearly basis.
There are many variations of profit-sharing plans, including:

- Approved share participation plans
- Share subscription plans
- Share option plans
- Save As You Earn (SAYE) plans
- Restricted share plans

Source: Smyth 1999

Each plan has its own individual merits.

On joining the ‘Save As You Earn’ (SAYE) plan, the employee agrees to save a fixed sum out of net pay for a pre-determined period (usually five years). The employee is granted share options on the basis of the amount they agree to save. At the end of the five years, the employee has the following choices (i) use the proceeds to buy some or all of the shares covered by the option, (ii) take the proceeds as a tax-free cash sum, (ii) continue to invest in order to qualify for a higher sum in the future.

The employee can decide to stop saving before the five years are completed. In this case, the employee can keep the proceedings of the savings in cash.

Share prices may be subject to sudden and often dramatic fluctuations, often outside the control of the particular company. A good underlying company performance will over time reflect itself in increased share value. That fact, together with the variable nature of the investment, must be clearly communicated to individuals through an effective communication programme. It is essential that individuals completely understand what is involved in profit-sharing plans.

Section 14.7
Performance Appraisal

Performance appraisal is a very common way to reward individuals through annual salary increases.

It is a structured interaction between an individual and their superior to formally appraise the individual’s progress on a number of goals, both organisational and personal.

In many organisations — but not all — appraisal results are used, either directly or indirectly, to help determine reward outcomes. That is, the appraisal results are used to identify the better performing employees who should get the majority of available merit pay increases, bonuses, and promotions. By the same token, appraisal results are used to identify the poorer performers who may require some form of counselling, or in extreme cases, demotion, dismissal or decreases in pay.
Performance appraisal is a very common way to reward individuals through a combination of intrinsic and extrinsic motivational factors.

Researchers and managers disagree on the need to link appraisal with reward. Advocates argue that it can lead to significant increases in innovation and productivity. Critics argue that increases in productivity do not require a link with rewards, and that linking both can ultimately be damaging for team morale.

Learning Activity 14.2
Search Online: http://www.ted.com for a lecture from Charles Leadbeater that innovation isn’t just for professionals anymore. 
Make notes.
Add to your portfolio.

One compromise argues for a performance appraisal system for individuals with no reward, coupled with a group-based reward system (similar to gain-sharing) when a reward is shared equally across a team. The process typically involves agreeing specific development topics at the beginning of each year, and then appraising the individual's and team's performance at the end of the year.

The performance appraisal system is typically constructed around a range of organisational and personal development topics. In the context of the approach adopted in this module, individuals can find themselves motivated to contribute to specific goals within the following areas (Wreath 2002):

- Contribution to specific objectives
- Contribution to specific indicators
- Development of specific technical/management skills
- Development of specific interpersonal skills
- Development of specific personal skills

**Specific objectives:** The individual is given a number of objectives that they take responsibility for achieving either individually or as a team. These are typically the same objectives, or a subset of the main objectives for the organisational as a whole. Individuals are usually measured on up to three of the most important objectives.

**Specific indicators:** The individual is given up to three performance indicators that they take responsibility for achieving either individually or as a team. These are typically the same indicator or a subset of the main indicators for the organisation as a whole. Individuals are usually measured on up to three of the most important indicators.

**Technical/management skills:** The individual agrees to develop specific technical and management skills over the course of the appraisal period e.g. computer programming skills, project management skills and so on. These skills may be achieved simply through the completion of particular training programmes.
**Interpersonal skills:** The individual is assigned a number of interpersonal skills to develop either independently or through attendance at particular courses of study. The list of potential skills includes: Articulating Ideas; Coaching; Customer Orientation; Delegation; Developing Others; Giving Recognition; Good Listener; Handling Pressure; Initiative and Risk-taking; Mentoring; Monitoring Performance; Motivating; Open and Ethical Communication; Organisation; Personal Integrity; Problem Solving; Responding to Feedback; Self-confidence; Teamwork.

**Personal skills:** The individual is assigned a number of personal skills to develop either independently or through attendance at particular courses of study. The list of potential skills include: Commitment; Communication skills; Emotional resilience; Encouraging motivation; Future scanning; Listening to others; Managing conflict; Networking; Positive self-regard; Responsibility; Self-awareness; Self-development; Support; Training; Personal integrity; Problem solving; Responding to feedback; Self-confidence; Teamwork.

The performance appraisal system allows an opportunity for the individual to add other achievements outside of the objectives agreed.

**Learning Activity 14.3**
Search Online [http://www.managementhelp.org](http://www.managementhelp.org) and look up the MBO technique.
Make notes.
Add to your portfolio.

**Section 14.8**
**Case Study**

SwitchIt operates a performance appraisal system for its entire monthly paid staff. Each staff member has someone to whom they report. At the beginning of the year, both manager and employee meet to discuss what the goals for the individual employee are for the year. These goals are typically related to the goals of the organisation. They also discuss what actions the individual employee may be working on at the time, and has planned for the future i.e. what projects they will support in the future. Finally, they also discuss what skills—technical, personal and interpersonal—the individual employee will develop over the year. They complete a form (See Figure 14.1). At various times during the year, the status of the various employee goals, actions and skills are reviewed informally to see if changes need to be made or remedial actions need to take place. At the end of the year, both meet to review what was achieved and to agree a new set of goals for the next year.
Learning Activity 14.4
Write a short note about the performance appraisal system used in your own organisation. What is it based on? Has it profit-sharing and gain-sharing elements? Is it linked to the reward system? Do you think it is a fair system? Why/why not?
Suggest ways to improve the performance appraisal system.
Add to your portfolio.

Section 14.9
Unit Review

Maslow has identified that needs only become motivators when they are left unsatisfied.

Motivating performance can be achieved through a combination of intrinsic and extrinsic techniques. Intrinsic motivation has long been recognised as a powerful and potent motivational force.

Intrinsic reward involves creating a stimulating and motivating work environment that appeals to the individual's need for self-actualisation in their career.

Extrinsic reward involves developing a system where the individual's performance can be linked to the performance of the organisation and for some organisations lead to tangible rewards such as share options and pay increments.
The ideal scenario for many organisations is to maximise the factors that provide intrinsic motivation and optimise extrinsic-based systems.

The overall performance appraisal system combines elements of both. It specifically ties an individual's personal goal with the goals of the organisation.

Gain-sharing is a group bonus scheme where the entire organisation share in the benefits that result from improved innovation. Gain-sharing uses a formula that is simple to understand and easily related to growth — productivity or profitability.

There are four critical components to developing a successful gain-sharing plan:

- Management commitment
- Employee involvement
- Structures
- Communication

Profit-sharing is an incentive plan that pays bonuses based exclusively on profits as opposed to growth in, say, productivity or market share.

Performance appraisal is a very common way to reward individuals through a combination of intrinsic and extrinsic motivational factors.

The performance appraisal system allows an opportunity for the individual to add other achievements outside of the objectives agreed.

**Section 14.10**

**Self-Assessment Questions**

1. Give an example of intrinsic motivational factors mentioned in this and previous sections of the module.

2. What is the principal difference between the gain-sharing and profit-sharing approaches to motivation and reward?

3. Explain what management approach you would adopt if you were to implement the performance appraisal approach with your organization, i.e. how many meetings, who would attend meetings, what would be discussed at meetings, etc.
Section 14.11
Answers to Self-Assessment Questions

1 Intrinsic motivation comes from within the individual. Maslow showed how individuals graduate from social needs and ego needs to self-actualisation needs. An environment that provides self-actualisation may be one that fulfils the psychological job criteria discussed earlier in the module, i.e. autonomy and discretion, sense of meaningful contribution, opportunity to learn and continue learning on the job, optimal variety, opportunity to exchange help and respect, prospect of a meaningful future. On the other hand, this motivating environment could be characterised by the points raised in Unit 13 about team behaviour, i.e. common goals, enablement, empowerment, structured meetings, mutual accountability, mutual trust, effective leaders and equitable reward and recognition. Effective leadership can be a powerful motivational force and a number of points of effective leadership were discussed in Unit 12 re Leadership Competencies.

2 Gain-sharing involves developing a formula for measuring gains in the organisation and a set of decisions based around the results of the formula. If positive, the entire team shares in some reward. Profit-sharing allows an individual the option of purchasing a share in profits. If profits rise, then the individual's stake rises. There are risks and benefits with both approaches for both parties involved.

3 One example: Once a year the manager meets each individual to mutually agree a set of individual targets that are linked to the organisation's overall goals. Manager reviews progress towards those goals say every three months at a short meeting. At the end of the year, a thorough review of agreed goals is carried out. In addition, any salient issues are raised as to why goals were particularly easy or hard to achieve. In addition the reviewee can state any additional goals or activities that were met. The reviewee is given an overall score which is entered in the employee record, and the process begins again.
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<td>214</td>
</tr>
</tbody>
</table>
Section 15.1
Unit Introduction

One of the primary causes of failure in the innovation process is poor monitoring of results.

This section looks at ways of communicating the results of goals, actions and teams in any organisation. It is critical to point out that when we wish to share information within a team we must carefully consider the audience for whom the information is intended. The basic principle is to share information of use to each individual involved in the team. Any information that is only of use to one or a subset of individuals needs to be treated separately. General information of use to a group can be ‘drilled into’ during a meeting through reports from the individuals responsible. Focusing on information of use to the team as a whole avoids cluttering valuable communications channels, wasting valuable time and creating ‘communications noise’ that distracts the team from important decisions. Reporting usually takes place over particular periods, e.g. weeks or months, and is usually accompanied by bilateral, subgroup and full team meetings. It is at these meetings that results can be discussed and any future actions agreed that help the organisation to meet its objectives.

Section 15.2
Unit Learning Objectives

When you have successfully completed the unit you will be able to:

- Assign status to various goals, actions and teams
- Record various lessons for each goal and action
- Explain the importance of sharing concise and simple results

Section 15.3
Status Signals

There are a wide variety of techniques to signal the status of an activity to team members. In this section we will focus on a number of simple and easy-to-deploy techniques:

- status fields
- traffic lights
**Status fields:** Status fields indicate various aspects of the status of an activity. The table below lists a number of common approaches. The % Complete field is an indication of how complete an activity is. 0% indicates that the activity has not started and 100% represents full completion. The progress field is a visual signal for indicating various states of progress e.g. 'In Progress' and 'Waiting'.

<table>
<thead>
<tr>
<th>Data Field</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>% Complete</td>
<td>0–100%</td>
</tr>
<tr>
<td>Priority</td>
<td>High, Normal, Low</td>
</tr>
<tr>
<td>Progress</td>
<td>Not Started, In Progress, Completed, Waiting, Deferred, Abandoned</td>
</tr>
<tr>
<td>Status</td>
<td>(See Traffic Lights example below)</td>
</tr>
</tbody>
</table>

**Traffic lights:** The traffic lights system of signalling the status of an activity has become very popular in organisations for its simplicity and visual impact. The meaning of each traffic light state (i.e. green, amber or red) varies between organisations. The table below illustrates the three states and their possible meaning.

<table>
<thead>
<tr>
<th>Image</th>
<th>Interpretation</th>
<th>Alternative Interpretation</th>
<th>Alternative Image</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green</td>
<td>Activity progressing well inside control limits</td>
<td>Activity progressing well</td>
<td>Green / smiley face</td>
</tr>
<tr>
<td>Amber</td>
<td>Activity entering or leaving ‘out of control’ area</td>
<td>Discussion required if time available</td>
<td>Amber / neutral face</td>
</tr>
<tr>
<td>Red</td>
<td>Activity out of control</td>
<td>Discussion required</td>
<td>Red / unhappy face</td>
</tr>
</tbody>
</table>

**Learning Activity 15.1**
Search online for examples of useful control system descriptions of the type described here, samples from companies etc. Post a short description of useful sites plus their URLs on the class site for other course participants to share.

Some organisations have a control perspective on the meaning of each state. If the light is red, then the activity is seen as out of control and the individual responsible needs to report on the causes and remedies. This interpretation can lead some individuals to hide the true status since they equate a red signal with their own personal failure even if the activity is a group event.

A softer interpretation is to equate each signal with the need or not to discuss the activity.
If the light is red, then the individual responsible is signalling a need to discuss the activity within the team. The culture within the team in this case is one where the team takes ultimate responsibility for the activity being in or out of control. The individual labelled as responsible takes on the role of ‘watchdog’ and brings the activity to the attention of the team when necessary.

A criticism of the traffic light system is how to address the issue of individuals with colour blindness. A simple way of overcoming this is to provide an additional graphic element e.g. the traditional red circle become a red circular unhappy face or ‘smiley’.

Case: Adco Animal Products Ltd. monitors and discusses the status of its strategic objectives each month. It uses two data fields to signal status — % Complete and Status. Any objectives with a red light are automatically discussed as its monthly meeting. Amber lights can also be discussed if they are in transition from green to red. It is up to the individual responsible to indicate the status of the objective. He or she voluntarily switches a signal based on their own perceived status of the objective. Turning a signal red is an indication of concern and also an indication that the individual responsible wants the activity discussed in the meeting. Figure 15.1 illustrates the status of their strategic objectives at a moment in time.

Figure 15.1: Status of Objectives at Adco Animal Products Ltd
Section 15.4
Capturing Lessons Learned

Previously we discussed the importance of organisational learning that among other things allows for reflection on the lessons learned during the execution of a particular activity. There are a number of simple techniques useful for tracking these experiences of executing an activity: capturing (i) Highs, (ii) Lows and (iii) Future actions.

**Highs:** these are the things that went right in the preceding reporting period such as any performance gains, increase in participation, good news, etc. Tracking highs gives a historical account of the positive attributes of a particular activity, and how they may be repeated in the future.

**Lows:** these are the things that went wrong or poorly in the preceding reporting period such as performance expected but not achieved, disputes, bad news and so on. Tracking and discussing lows within the team environment is important for sharing and solving problems, and if possible avoiding the same lows on other activities in the future.

**Future actions:** these are the future actions that will be conducted in the next reporting period to attempt to remedy any lows that have occurred in the past. They represent attempted solutions to any problems that have occurred. Tracking future actions for a particular activity allows them to be revisited in the next reporting period to assess if they have been successful.

Learning Activity 15.2
Create a highs, lows, actions chart for the next month for one of the following at your place of work: a project team/work system/your own work team/some other suitable team activity at your organisation. Make notes on the learning from this activity. Add to your portfolio.

Capturing a limited amount of information in lessons learned helps to foster a learning organisation culture.

Case: Each of SwitchITs innovation activities is provided with a means to record highs, lows and future actions to be discussed at their weekly project portfolio meeting. All activities — goals, actions and team — have the same fields to allow consistency of communication across their entire portfolio regarding any lessons that need to be learned. Figure 15.2 illustrates a truncated project sheet and the fields used by the individual responsible for communicating highs, lows and future actions.
Section 15.5
Structuring Results

Results can be structured using the following data fields. Each of these data fields can be placed within the various forms and tables that have been described earlier and where someone has been given responsibility for reporting the results.

1. Percentage Complete
2. Status

Percentage Complete is a simple number from 0–100% that indicates how much of the activity is complete. The Status could be the ‘traffic light’ signal i.e. green, amber or red, described above.

Section 15.6
Case Study

SwitchIt uses a small number of common fields across all of the forms it uses for Objectives, Indicators, Ideas and Projects. Each form contains the fields: Status and Percentage Complete. Over the years, attempts have been made to add new fields such as Effort and Overdue. These were initially tried but found to create excessive information ‘noise’ that detracted from the other fields and also increased the resistance by users in completing the fields. SwitchIt Ltd. proudly boasts that it has learned to depend on a maximum of 16 common fields across all its information systems used collaboratively by the innovation team. Individuals can of course choose to add many other fields within their own personal information systems. See sample view in Figure 15.3.
Section 15.7  
Unit Review

One of the primary causes of failure in the innovation process is poor monitoring of results.

Tracking information on the results of activities for sharing with other members of the innovation team is a critical part of effective innovation management. There are a wide variety of techniques to signal the status of an activity to team members.

Status signals allow individuals to draw attention to poorly performing activities and encourage views on discussing corrective actions. This unit looked at two popular methods of tracking activities:

- status fields
- traffic lights

Capturing a limited amount of information in lessons learned helps to foster a learning organisation culture.

Tracking high and lows from preceding reporting periods allows all members of the team to look at any lessons that can be learned from an activity. Over the entire life of the activity, all of the high and lows can be reflected upon in the context of the overall achievement of the activity.

This unit described a number of very simple techniques that require very little effort to implement, but can potentially have a very high impact in getting team members to communicate with each other on issues of common interest.
Section 15.8
Self-Assessment Questions

1 Why is it important to have fewer status signals?

2 Discuss the role of data fields in capturing lessons from executed activities in previous reporting periods.

3 Why do you feel it may be important for all activities to have the same or similar data structures for capturing results?
Section 15.9
Answers to Self-Assessment Questions

1. At team meetings there are many goal issues (indicators, objectives, requirements) and actions (ideas, problems, projects, projects) that may need to be discussed. It's important to have some indication of status for these activities. If there are too many fields to be completed, then individuals responsible will be less inclined to complete them and other team members will be less inclined to read them. One or two status signals that everyone agrees to update and read enhance communication and participation.

2. Highs capture the positive things that happened in a previous reporting period. This positive information can be shared across the team and allow everyone the opportunity to learn something positive. Lows capture the negative things that happened in the preceding period. Any problems can be discussed openly in the team. Others may learn from any mistakes but also contribute views that may remedy the situation in the next reporting period.

3. Consistency of look and feel across all activities (goals, actions and teams) enhances ease of use and communication. In the examples given above, individuals need only handle five data fields. Additional information can be shared verbally in a group situation or between individuals at separate meetings and through other information-sharing techniques (e.g. e-mail).
Mapping Relationships

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Section 16.1
Unit Introduction

So far, we have discussed a variety of information types used in managing innovation in any organisation. These have included various types of goals, actions, teams and results. Each of these information sources is important in its own right, however their importance increases significantly when they are related to one another. For example, projects must have goals, and understanding the relationship between projects and, say, performance indicators allows the innovation team to make more informed decisions. In this unit, a simple yet powerful technique is presented which can show the relationships between any two sets of information. Understanding relationships facilitates more informed decision-making and illustrates not only relationships, but also where gaps in a possible relationship exist.

The importance of information increases significantly when related to other information.

Section 16.2
Unit Learning Objectives

When you have successfully completed the unit you will be able to:

- Explain the concept of relationships between different sets of data
- Discuss how matrices can be used for discovering gaps in potential relationships
- Design a matrix for two or more sets of data

Section 16.3
Relationships

There are a number of ways of showing the relationship between two or more sets of information. Table 16.1 shows some of the more obvious techniques.

Table 16.1: Techniques for Showing Relationships between Information Sets

<table>
<thead>
<tr>
<th>Relationship</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>One to one</td>
<td>Where one data element is related to another data element e.g. Initiative3A is being led by Individual4B</td>
</tr>
<tr>
<td>One to many</td>
<td>Where one data element is related to a number of other data elements e.g. Initiative3A has team members Individual4B, Individual5C and Individual2E</td>
</tr>
</tbody>
</table>
The first three types are easy to implement in a knowledge management system.

**Table 16.1 (continued)**

<table>
<thead>
<tr>
<th>Relationship</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Many to one</td>
<td>Where many data elements are related to one data element e.g. Initiative3A and Initiative4D are managed by Individual4B</td>
</tr>
<tr>
<td>Many to many</td>
<td>Where many data elements are related to many other data elements. This is the same as One to Many and Many to One but represented together in a matrix</td>
</tr>
<tr>
<td>Parent-Child</td>
<td>Where one data element is the parent of another data element. There is a hierarchical relationship between the data elements e.g. Indicator2A is a subset or child of Indicator3S.</td>
</tr>
</tbody>
</table>

The representation of many-to-many relationships can be achieved through the use of a simple matrix diagram.

The diagram illustrates where relationships exist and where they do not exist. Matrix diagrams are used to identify the relationships between pairs of lists. Representation of parent-child relationships can be achieved using a tree diagram. Both of these diagrams are good at illustrating the many-to-many relationships that exist when comparing two lists. They can also be used to describe the strength of relationships between pairs of data.

**Section 16.4**

**Matrix Diagram**

The matrix diagram is a decision-making tool that facilitates systematic analysis of the relationships between two or more sets of data. It typically consists of a table whose first column and top row contain the data sets.

One of the more complex matrix diagrams is the house of quality used in quality function deployment.

The cells that form the matrix between the data sets can contain symbols or numbers that denote the strengths of relationship between the data sets. Figure 16.1 illustrates a simple matrix diagram for two data sets — goals and actions. It also illustrates an additional row and column for indicating the results of each element in the data sets.

The matrix consists of cells that can contain symbols that denote the strength of a relationship between a pair of data elements. This provides a strong visual signal that is easy to interpret quickly. The symbols can be simple dots, or they can be assigned values that can be summed up to give a numeric indication of
the strength of a relationship. The data list on the left-hand column can be interpreted as representing the ‘what’ of a problem, the data list on the horizontal row then represents the solution or ‘how’ to the problem.

In general, the data elements belonging to the same row or column should have something in common, so that they comprise a set that represents something e.g. a set of objectives or a set of ideas. The strength of relationship between each pair of data elements is indicated on the cell where they intersect with a symbol (e.g. circle, partially shaded circle or fully shaded circle) or a number (say, 1-3, with 3 denoting the strongest relationship).

The basic questions that the analyst can ask of the matrix are:

- What is the relationship between any two data elements?
- Why particular row elements are not related to particular column elements?
- Why are particular column elements not related to particular row elements?

In the case of a matrix between, say, objectives and projects the specific questions would be: (i) why some projects have no objectives and (ii) why some objectives have no projects. The answers to these questions will result in some action being taken, i.e. sanction or discontinue projects that have no alignment with objectives, or create new projects.

**Section 16.5**

**Types of Matrix Diagram**

There are a number of types of matrix diagram, from very cumbersome three-dimensional diagrams to the simple two-dimensional matrix illustrated in Figure 16.1.

![Figure 16.1: L-shaped Matrix Diagram](image)
Table 16.2 shows L-shaped matrices that can be created among the various data sets or lists discussed in previous units of this module.

Table 16.2: Relationships for L-Shaped Matrices

<table>
<thead>
<tr>
<th>Goals versus Goals:</th>
<th>Goals versus Actions:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objectives versus Indicators</td>
<td>Objectives versus Projects</td>
</tr>
<tr>
<td>Indicators versus Requirements</td>
<td>Objectives versus Ideas</td>
</tr>
<tr>
<td>Objectives versus Requirements</td>
<td>Indicators versus Projects</td>
</tr>
<tr>
<td>Etc.</td>
<td>Indicators versus Ideas</td>
</tr>
<tr>
<td></td>
<td>Etc.</td>
</tr>
<tr>
<td>Goals versus Teams:</td>
<td>Actions versus Teams:</td>
</tr>
<tr>
<td>Objectives versus Responsible</td>
<td>Projects versus Responsible</td>
</tr>
<tr>
<td>Indicators versus Responsible</td>
<td>Projects versus Team</td>
</tr>
<tr>
<td>Etc.</td>
<td>Projects versus Creator</td>
</tr>
<tr>
<td></td>
<td>Etc.</td>
</tr>
<tr>
<td>Teams versus Teams:</td>
<td>Actions versus Actions:</td>
</tr>
<tr>
<td>Individuals versus Skills</td>
<td>Ideas versus Ranking Criteria</td>
</tr>
<tr>
<td>Individuals versus Courses</td>
<td>Problems versus Risk</td>
</tr>
<tr>
<td>Leader versus Teams</td>
<td>Projects versus Schedules</td>
</tr>
<tr>
<td>Etc.</td>
<td>Etc.</td>
</tr>
<tr>
<td>Actions versus Teams:</td>
<td></td>
</tr>
<tr>
<td>Projects versus Responsible</td>
<td></td>
</tr>
<tr>
<td>Projects versus Team</td>
<td></td>
</tr>
<tr>
<td>Projects versus Creator</td>
<td></td>
</tr>
<tr>
<td>Etc.</td>
<td></td>
</tr>
<tr>
<td>Teams versus Teams:</td>
<td></td>
</tr>
<tr>
<td>Individuals versus Skills</td>
<td></td>
</tr>
<tr>
<td>Individuals versus Courses</td>
<td></td>
</tr>
<tr>
<td>Leader versus Teams</td>
<td></td>
</tr>
<tr>
<td>Etc.</td>
<td></td>
</tr>
<tr>
<td>Actions versus Actions:</td>
<td></td>
</tr>
<tr>
<td>Ideas versus Ranking Criteria</td>
<td></td>
</tr>
<tr>
<td>Problems versus Risk</td>
<td></td>
</tr>
<tr>
<td>Projects versus Schedules</td>
<td></td>
</tr>
<tr>
<td>Etc.</td>
<td></td>
</tr>
</tbody>
</table>

Section 16.6
Hierarchy of Matrices

Matrices can also be related to each other in a parent-child relationship. Focusing on the L-shaped matrix, the row or top list of the matrix can be transposed into the first column of a new matrix. A new list can then be related to these data elements. For example, customer requirements can be related to, say, design features in the first matrix. Design features can then be related to, say, performance indicators in a second matrix. Performance indicators can then be related to projects in a third matrix and so on.

Relationship matrices can be linked to each other in a hierarchy, where one matrix is the parent of another.

Section 16.7
Case Study

The relationships between Projects and Objectives and Project and Indicators at SwitchIt Ltd. are illustrated in Figure 16.2 and Figure 16.3 respectively.
## Relationships

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Projects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Install Robotic Welding</td>
<td></td>
</tr>
<tr>
<td>Redesign Assembly Line</td>
<td></td>
</tr>
<tr>
<td>Investigate ERP System</td>
<td></td>
</tr>
<tr>
<td>Investigate Workgroup Procedures</td>
<td></td>
</tr>
<tr>
<td>Develop Workgroup Procedures</td>
<td></td>
</tr>
<tr>
<td>Restart Sports and Social Activities</td>
<td></td>
</tr>
<tr>
<td>Implement Innovation Training</td>
<td></td>
</tr>
<tr>
<td>Implement Changes on selected items</td>
<td></td>
</tr>
</tbody>
</table>

**Figure 16.2: Objectives vs. Projects**

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Projects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shipped Weight per Employee</td>
<td></td>
</tr>
<tr>
<td>Delivery Performance</td>
<td></td>
</tr>
<tr>
<td>Absenteeism</td>
<td></td>
</tr>
<tr>
<td>Defects per Unit</td>
<td></td>
</tr>
<tr>
<td>Warranty per 1000 units per month</td>
<td></td>
</tr>
<tr>
<td>Manufacturing Lead Time</td>
<td></td>
</tr>
<tr>
<td>Cost Savings</td>
<td></td>
</tr>
<tr>
<td>...</td>
<td></td>
</tr>
</tbody>
</table>

**Figure 16.3: Indicators vs. Projects**
Learning Activity 16.1
Create two matrices for your own organization or work team based on figures 16.2 and 16.3. Projects v organizational Objectives; Indicators v Projects. Add to your portfolio.

Section 16.8
Unit Review

Matrices are a simple yet powerful decision-support tool for understanding relationships between two or more lists of data. Their simplest form, the L-shared matrix, is a visual representation of where relationships exist, where they don’t exist and perhaps where they should exist. The cells where two data elements intersect can be filled with graphical elements or numbers. There are a large number of possible matrices in any innovation plan. Matrices are a simple, yet effective, decision-support tool for innovation teams.

Learning Activity 16.2
Spend some time reviewing how Microsoft Excel or an equivalent software package can be used for creating relationship matrices automatically.

Section 16.9
Self-Assessment Questions

1 List all of the possible matrix diagrams that can be constructed for a list of indicators, a list of ideas and a list of individuals.

2 Construct a matrix diagram that relates a list of projects with a list of ranking criteria such as '%Complete', 'Rank', and 'Status'

3 Explain the concept of relationships between different sets of data

4 Discuss how matrices can be used for discovering gaps in potential relationships
Section 16.10 Answers to Self-Assessment Questions

1 Indicators vs. Ideas, Indicators vs. Responsible, Ideas vs. Responsible, Ideas vs. Creators, Ideas vs. Ranking, etc.

2 This type of matrix is common throughout your module activities and is sometimes called a 'view' since it represents each of the data elements associated with a particular list in a database.

3 There are a number of basic relationships between sets of data based on words. Mentioned above are one to one, one to many, many to many and hierarchical relationships.

4 The matrix will typically illustrate two sets of data. The matrix illustrates two key concepts (i) the relationship between the pairs of data elements and (ii) where relationships do not exist.
References


References


Further Reading


