APPLING INNOVATION

by David O’Sullivan
Preface

Few topics have exercised our minds as much as innovation. Yet for most of us, many aspects of it continue to remain a mystery. The application of innovation in our specific circumstances 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 better 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 customer’s and introduce ideas that can lead to 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.

The aim of this workshop is to give you some important insights into how ideas can be managed and transformed into innovation in any organisation. The workshop is a systematic approach to managing ideas, what causes them and where they will lead you. The workshop brings together a number of techniques that can be used to improve the innovation process. It includes a range of ideas that are easy to implement and have worked very successfully in leading companies throughout the world.

This booklet is accompanied with a case study and an assignment for you to complete. It is also accompanied by a prototype web application for helping you create and present your assignment. You can find all these resources at www.owl.ie I hope you enjoy your learning experience and please don’t hesitate to offer feedback.

David O’Sullivan
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Introduction

Innovation is an important force in creating and sustaining business growth. Effective innovation can mean the difference between leading with a particular product, process or service and simply following the pack with the risk of stagnation and decline. Innovation transforms mediocre companies into world leaders, and ordinary organisations into stimulating environments for employees.

Innovation is important for all organisations — profit and non profit. It is as relevant for a hospital as it is for a bank or manufacturing company. Innovation occurs at various levels within an organisation, from management teams and departments to project teams and even individuals. Innovation is often viewed as producing a new product or service. In fact it is about making all kinds of changes, both radical and incremental, throughout an organisation.

Innovation is defined as the process of making changes to something established by introducing something new. Innovation management is about putting tools, techniques and methods in place that can encourage individuals to work together in defining innovation goals, managing ideas and projects, and monitoring results. Innovation management is about building a community within an organisation whose common purpose is to generate ideas and change products, processes or services so that they can add value to customers and perhaps even exceed their demands.

This booklet contains a systematic approach to developing high-impact innovation in any organization. High-impact innovation requires close attention to the five key areas — goals, actions, teams, results and communities, and perhaps of equal importance, to the connections between them.

Learning Goals

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

- Explain the theory and process of innovation
- Describe how to manage innovation
- Apply skills for defining goals, generating ideas, empowering teams and monitoring the results of innovation
- Apply what you have learned to managing innovation in any organisation
Defining Innovation

Introduction

All organisations need to generate ideas and change in order to sustain their current activities and develop growth. Some changes are positive and lead to increased efficiency and revenue, while others are negative and risk stagnation and decline. The principal mechanism for change in any organisation is idea generation that leads to innovation. Innovation occurs to products, processes and services. This part of the booklet defines the main concepts behind innovation. Innovation is the process of generating new ideas that make changes to something established. Innovation is classified according to its impact on products, processes or services. The difference between radical and incremental innovation is discussed, with a particular focus on disruptive technologies.

Learning Goals

When you have completed this section 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

Definition of Innovation

Innovation is defined as ‘Making changes to something established by introducing something new’\(^1\). This definition does not suggest that the ideas behind change need to be radical or that they need to happen exclusively to products. Ideas are often mundane and incremental and can affect products, processes and services at every level within an organisation.

The term ‘innovation’ is often confused with the term ‘invention’. Invention is defined in the dictionary, as ‘Creating something new that has never existed before’. Invention is often about ideas that create something that has yet to be desired by a customer.

Sample: 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 had never existed before. The new flat-screen

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television, on the other hand, was an innovation. It met a desire from customers to have flatter, more high-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 another innovation by a company renowned for its innovation processes. They argued that it could destroy the traditional tube television market. However, customers found the new interactive TV too expensive and too cumbersome to use. The Interactive TV itself was ultimately destroyed by the innovation process and replaced by more successful ideas.

In innovation, destroying poor ideas is often as important as nurturing good ones. To express positive innovation, we need to add 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 in turn will lead to greater revenue and growth for the organisation.

Today’s innovation will become obsolete in the future. For organisations to sustain innovation, they must learn how to continuously 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.’

Alternative Definition

There are numerous alternative definitions to innovation. One popular alternative is to present innovation as an invention that has been exploited commercially. In this alternative definition, the term ‘innovation’ means exploiting the invention and making it commercially successful. We can denote this alternative definition of innovation with the following expression:

\[ \text{Innovation} = \text{Invention} + \text{Exploitation} \]

Innovation management therefore, is a systematic approach to creating an environment based on discovery, invention and
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commercial exploitation of ideas that meet unmet needs. This definition fits very well with many of the high-profile examples of innovation that we are familiar with, such as the invention of the transistor used in computers, or radio frequency identity tags used on credit cards. However, it also hides the millions of innovations that are often much smaller in scale or not necessarily exploited in the same commercial sense. This alternative definition also has a strong technology focus. This booklet focuses on the tools and techniques necessary for radical and incremental innovation as described earlier. The issues surrounding the definition in this section such as invention and exploitation are beyond the scope of this booklet but the reader is referred to a number of excellent books on this subject in the ‘Bibliography’ at the back of this booklet.

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 (i) introducing a new screen size in television sets, (ii) changing from the old tube television to flat screen televisions or (iii) adding functionality such as internet access to televisions.

**Process innovation** is about making changes to the processes that produce products or services. For example (i) building new machines that assemble televisions, (ii) redesigning the assembly line so that televisions can be manufactured more cheaply and (iii) outsourcing the production of the plastic covers on televisions so that those costs can be reduced, and quality improved.

**Service innovation** is about making changes to services that customers use. For example (i) changing the way dealers sell new televisions in order to keep costs low, (ii) changing the way customers get rid of their old televisions by introducing a ‘take back’ policy and (iii) 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.
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Sample: 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. They were attracted by the low cost and high efficiency that came with buying their own tickets online.

Radical and Incremental Innovation

The definition of innovation does not refer 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. On the other hand, a change such as changing the colour or the size of the screen is relatively small or incremental. Innovation can be:

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. 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. Most organisations engage in some radical innovations during the lifetime of their innovation or development plans.

Incremental innovation is about making small continuous changes to a product, process or service. These changes are often more

Figure 1: Radical and Incremental Innovation

 Incremental Innovation
Making small changes that have short-term impact on growth.

Radical Innovation
Making changes that have large ‘step’ changes in growth.

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numerous and less risky than radical changes but they also often have lower impact on growth. Some organisations such as manufacturing and more established service organisations rely totally on incremental innovation and deploy techniques such as ‘Total Quality Management’, ‘Continuous Improvement’ and ‘Lean Manufacturing’ to make many small changes to the organisation. Organisations engage in many incremental innovations during the lifetime of their innovation or development plans. Innovative organisations will typically have many incremental changes and a small number of radical changes occurring in the same planning period.

Sample: 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 to 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.

Disruptive Innovation

Every now and then a radical innovation is introduced that disrupts business practice. In other words, business practice changes radically. These disruptive innovations often occur mainly through new sciences and technologies. For example, many years ago the television depended on a technology called the ‘vacuum tube’ for its operation. Owners of these televisions waited for 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 seconds. The transistor dramatically changed or disrupted business practice around the design and manufacture of televisions. Early adopters of transistors made significant increases in market share. Slow adopters went out of business.

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

Arguably the largest disruptive technology to emerge has been the internet and World Wide Web. The web has radically disrupted
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huge ranges of products, processes and services across many business sectors. 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 customers. Services such as film rental now use the web to offer customers the latest films that are then downloaded directly to their television on demand.

Sample: Radio Frequency Identity Detection (RFID) 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. Waiting times to pay for goods can be long. RFID tags can be detected remotely by receivers. If all of the items in our basket have RFID tags, then all we need to do is push the shopping basket under a radio frequency receiver. It will remotely detect every item in the basket. The value for customers is shorter times at the ‘check out’ or the replacement of ‘check outs’ altogether.

Summary

Innovation is the process of making changes to something established by introducing something new. Innovation is not to be confused with invention. It can be radical or incremental and it can apply to products, processes and services. Disruptive innovation is radical innovations that disrupt forever the way business is normally conducted. All changes, large or small, to an organisation are classified as innovation.

For more information on innovation in your own language why not try: http://www.wikipedia.org

Reflections

Explain the difference between innovation and invention
Give one example of each of the following types of innovation:
(i) product, (ii) process and (iii) service
Give one example each of a radical innovation and an incremental innovation
What is a disruptive technology?
Managing Innovation

Introduction

Every organisation invests to a larger or lesser extent in innovation — making changes to something established. Organisations invest a proportion of turnover to make changes to its products, processes and services. There are particular reasons or goals that should be achieved because of this investment. However, research has shown that a very large percentage of innovations fail to meet these goals. The reasons behind failure give us clues on how avoid failure in the future. This section 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.

Learning Goals

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

- Give reasons why organizations invest in innovation
- Measure the amount of investment that organizations make
- Learn why organizations make these investments i.e. their goals
- Give reasons why most innovation fails.

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 little as a half a percent of turnover to anything over twenty percent of turnover for organisations. The average investment across all types of organizations is four percent. For an organisation with a turnover of, say, one billion euros, this represents an investment of forty million euros annually. This budget will typically be spread across various departments including marketing, product design, information systems, manufacturing systems, quality assurance and so on.

The principal goals to be achieved in return for this investment vary across organisations. The following have been found from a European survey. They are ranked in order of popularity:

- Improved quality
- Creation of new markets

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Extension of the product range
Reduced labour costs
Improved production processes
Reduced materials
Reduced environmental damage
Replacement of products/services
Reduced energy consumption and
Conformance to regulations.

These goals include 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, a marketing firm, a hospital or a local government organisation. 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.

Failure of Innovation

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 quotes figures as high as ninety percent\(^4\). From another perspective, one survey regarding product innovation states that out of three thousand ideas only one will become a success in the marketplace\(^5\). Failure is an inevitable part of the innovation process, and most successful organisations factor this into the change process. 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 higher resistance to change in the future.

The causes of failure have been widely researched. They can vary considerably between organisations. 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 from one organisation to another, but the following are common across all organisations at some stage:

1. Poor Leadership
2. Poor Organisation
3. Poor Communication


(4) Poor Empowerment
(5) Poor Knowledge Management

Common causes of failure within the innovation process can be distilled into five types:

(1) Poor goal definition
(2) Poor alignment of actions to goals
(3) Poor participation in teams
(4) Poor monitoring of results
(5) Poor communication and sense of community

Tackling poor goal definition requires that organisations state explicitly what their goals are in terms understandable to everyone involved in the innovation process. This often involves communicating goals in a number of ways. Poor alignment of actions to goals requires linking explicit actions such as ideas and projects to specific goals. It also calls for effective management of action portfolios or groups of projects. Poor participation in teams refers to the behaviour of individuals and teams and the explicit allocation of responsibility to individuals. It also refers to the payment and rewards systems that link individuals to goals. Finally, improving poor monitoring of results requires simple and effective monitoring of all goals, actions and teams involved in the innovation process.

High Impact Innovation

Every organisation would like to achieve a return on their investment. 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:

1. Better definition of Goals
2. More effective alignment between Actions and goals
3. Greater participation of individuals in Teams
4. Better monitoring of Results
5. Great communications and building of Communities

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

(i) Statements such as the mission and vision statement
(ii) Requirements of stakeholders such as customers and shareholders
(iii) Objectives such as strategic plans and
(iv) Indicators of performance such as output and profits
Defining these goals is a key factor in creating high impact innovation. We will deal with Goals in more detail in the section on: Defining Innovation Goals.

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

(i) Problem identification and solution  
(ii) Idea generation  
(iii) Managing initiatives and projects  
(iv) Balancing project portfolios

A key issue is that actions are in some way aligned with the goals of the organisation e.g. ideas have goals. We will deal with Actions in more detail in the section on: Managing Innovation Actions.

**Teams**: A team is defined 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:

(i) Assigning responsibility  
(ii) Building structure in teams  
(iii) Improving participation by individuals  
(iv) Appraising performance of individuals

We will deal with Teams in more detail in the section on: Empowering Innovation Teams.

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

(i) Goals, such as objectives and indicators  
(ii) Actions, such as ideas and projects and  
(iii) Teams, such as their contribution

There are clearly many things going on at once and organisations must learn to use techniques such as the ‘traffic lights' system that allows them focus on critical activities. Organisations also need to learn about meeting management. We will deal with Results in more detail in the section on: Monitoring Innovation Results.

**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 personal goals of the individuals in it. Building community is a time-consuming process and involves key issues such as:

(i) Organisation and Leadership  
(ii) Benchmarking
(iii) Communications
(iv) Knowledge Management

We will deal with Community in more detail in the section on: Building Innovation Community.

**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 2.

The innovation funnel can be visualised as containing four arrows flowing around a 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 to 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, allowing fewer ideas to flow through. The availability of more teams or other resources such as funding, 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.

![Innovation Funnel Diagram](image)

Figure 2: Innovation Funnel

An important aspect of the innovation funnel is the relationships created between actions and goals. Ideas, for example, that cannot be associated with goals will find it difficult to proceed into the funnel. This has two effects. Firstly, the individuals or teams...
generating the ideas will study the goals more closely in order to generate an idea that matches better. Secondly, good ideas that 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. When goals change, there is a knock-on effect in the generation of ideas that meet these goals, because the innovation community in now tuned to having new ideas meet organisational goals. The process offers the innovation community the ability to change the innovation process in response to changing demands of stakeholders.

**Summary**

Organisations spend on average just under 4% of turnover on innovation, trying to achieve goals such as better quality, lower lead times, more product variety and increased market share. Most innovation fails to achieve these goals and some analysts argue that failure could be as high as 90%. The 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. Process failures such as definition of goals and aligning actions with goals are also important but can be remedied in the shorter term through better information and knowledge management. 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 the morale and skills developed by participants in the innovation process. Reducing failure by just fifty percent provides potential savings of twenty million euros annually for a one billion euro turnover company. The benefits from goal attainment mirror the common goals mentioned earlier — improved quality, better productivity, better product ranges and so on.

**Reflections**

- List some of the main reasons why organisations invest in innovation
- What are main causes of failure in achieving innovation?
- What are main issues that every organisation addresses regularly to achieve better impact from innovation?
- What are the key stages in the innovation process?
Defining Goals

Introduction

Defining innovation goals is the first and perhaps the most important activity in creating an innovative organization. Well-defined goals inspire ideas and guide activities towards the achievement of performance targets. A number of goals need to be defined. These include statements, stakeholder requirements, strategic objectives and performance indicators. This section looks at a number of ways for defining goals. A road map for defining goals is presented. The roadmap outlines a number of steps that need to be taken for developing a comprehensive set of goals. The first step looks at defining various types of statements. Some of these statements i.e. SWOT have been presented in the previous section. The next step looks at defining stakeholder requirements that are used to inform the strategic planning process. Strategic planning involves a number of key elements including the identification of strategic thrusts and defining strategic objectives. The final step looks at defining key performance indicators. Together, these various types of goals form a comprehensive definition of the innovation goals of any organization.

Learning Goals

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

- Explain the drivers of innovation goals
- Outline a process for defining goals
- Explain the various types of goals that can be created
- Outline the process of creating performance indicators
- Create a simple chart for monitoring indicators

Defining Goals

Goal planning is now a common technique for most organisations. This was not always the case. In the past, goals resided only in the minds of owners and senior managers who communicated them to subordinates through verbal instructions. Today’s complex business and service environments require employees to understand and share common goals in order to engage in idea generation and change. Few owners and managers now have the ability to set goals for an organisation, and simultaneously generate and manage the actions required for innovation. The principal approach in modern management is to define high-level goals for change and innovation within the organisation. These goals then guide individuals and teams in generating actions such as ideas and projects. The goals of the organisation inform the imaginations of individuals and set
Defining Innovation Goals

indicators of performance that projects and other actions need to achieve.

The main drivers of innovation goals are emerging new technologies, the more innovative activities of competitors, best practice by similar organisations, new ideas from customers and employees, stakeholder requirements and exceptional performance (negative or positive) from within the organisation. Added to these drivers are general changes within the organisation’s environment. All of these drivers help to create a ‘sense of urgency’ around the need to create new innovation goals. A number of types of goals can be created. Figure 3 illustrates five primary types of goals for any organisation. As stated earlier many organisations will only require a subset of these goals to be defined in the short term (e.g. indicators).

Figure 3: Innovation Goals

**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. Other types of statements include Strengths, Weaknesses, Threats, Opportunities, Health and Safety, Quality, Core Values and so on.

**Requirements:** There are requirements of the various stakeholders for an organisation. Stakeholders can be seen as the ‘customers’ in the broadest sense of the term. Typical stakeholders include customers, shareholders, employees, suppliers and so on. A list of requirements from stakeholders is a powerful form of goal setting activity. These can be worked on as goals directly or they can be translated into strategic objectives or performance indicators.
**Defining Innovation Goals**

**Objectives:** Strategic objectives are a more detailed list of goals typically divided into groups called strategic thrusts. The development of strategic objectives is informed by stakeholder requirements. It is also informed by the drivers of innovation mentioned earlier. Strategic Objectives are a list of typically between 10 and 30 very specific statements for where change and innovation needs to take place in the future over a planning period.

**Standards:** Standards are sometimes used in place of strategic objectives. Many standards used for developing an organisation contain statements that must be met by an organisation. For example the ISO9000 standard is a set of objectives that must be met by an organisation. EFQM is a variation of a standard that presents organisations with a standard set of objectives. There are other standards around issues such as products, health and safety, environment and so on.

**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 by a performance indicator. Selecting 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 to make changes physically happen to the organisation.

Goals need to be kept general. They should be used to guide change for between one and five years into the future rather than suggest explicit and specific types of changes to be performed. They need to leave room for individuals to make their own decisions regarding specific ideas or projects. 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’. For the remainder of this section we focus on one of the more popular types of goals — performance indicators.

**Performance Indicators**

Performance indicators are a measurable way of defining goals. Performance indicators include a number of measurable elements. They include targets for the future, 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 organization worth
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significantly more or less than its current financial figures suggest. This is because organisations are now increasingly measured in terms of their potential. A knowledge-based organization, for example can innovate — change its products, processes and services — in response to changing market demands. Because of this, its value is often far greater than its present financial value. Most innovation indicators are non-financial.

Indicators show progress towards defined performance targets, and motivate people towards achieving goals. Key questions for a 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 indicators promotes problem solving, idea generation and other forms of corrective action.

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

Sample: 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. Below are a number of samples of indicators that are popular in some organisations.

1. **Process** e.g. Productivity (hours/unit); Throughput (units per day); Utilisation (output/capacity)
2. **Marketing** e.g. Sales per region (units/region); Sales per model (units/model); Marketing costs (€/year)
3. **People** e.g. Attrition (individuals/year); Overtime (hrs/month); Absenteeism (days/month)
4. **Design** e.g. R&D Expenditure (€/year); Warranty Costs (€/month); Revenue Created by New Products in last five years; Value Analysis Savings (€/unit)
5. **Environment** e.g. Emissions (CO₂/month); Scrap and Wastage (tonnes/month); Accidents (lost days/month); Litigation (€/year)
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Every indicator must have a unit of measure e.g. €/year. 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 — ‘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.

Performance Charts

Performance indicators are measurable and therefore can be represented graphically using a performance chart. The key attributes of the performance chart are illustrated in Figure 4. 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 are the record of values over the planning horizon. These are illustrated as small stars in Figure 4. 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, and draw attention to this indicator for remedial action. Charts should be kept simple.

![Performance Chart](image)

Figure 4: Performance Chart

Balanced Scorecard

The Balanced Scorecard is regarded by many analysts and practitioners as one of the most effective management technique in recent decades. The balanced scorecard was developed by David Norton and Robert Kaplan as an approach to strategic management
and associated performance measurement and development initiatives [14]. The model advocates a top-down approach to performance measurement where a framework structure is used to translate organizational goals into stated objectives and measures. In their research into the way current companies measured performance, Kaplan and Norton studied Analog Device’s approach called the ‘Corporate Scorecard’ that involved measuring customer delivery times, product quality, life cycles and effectiveness in innovation. They revised this approach and introduced new measures such as shareholder value, new compensation plans and productivity measurements. They integrated them into the measurement system we now know as the Balanced Scorecard. The Balanced Scorecard divides strategic objectives, performance measures and any associated development initiatives into four perspectives (see Figure 5):

- Financial Perspective
- Customer Perspective
- Internal Processes Perspective
- Learning & Growth Perspective

**Figure 5: Balanced Scorecard**

**Financial Perspective:** Financial measurement remains a key variable in performance measurement but is balanced with non
Defining Innovation Goals

financial measures in the scorecard technique. The Balanced Scorecard measures both tangible and intangible assets to give an accurate account of the company’s physical and non-physical value. The Balanced Scorecard encourages organizations to align financial objectives with corporate strategy by selecting objectives and measures that focus on all the scoreboard perspectives.

Customer Perspective: Kaplan and Norton found that changing the company’s perception on how they value their customers was becoming an important factor in planning and managing performance. Companies needed to become customer focused by introducing strategies that change their objectives. Implementing the customer perspective of the Balanced Scorecard focuses the organization’s missions and strategies into clear objectives. These objectives should include meeting customer demands through quality and growing its customer base and market shares. The Balanced Scorecard encourages the company to focus the company on five important measures. The company should then customize these five measures to the organization’s target customers.

1. Market Share: Measures customers/dollars spent and products sold in a given market
2. Customer retention: Measure of the rate the company retains existing customers
4. Customer satisfaction: Measures of how happy the customers are.
5. Customer profitability: Measures of the net profit of customers after expenses to support customers are taken into account

Internal Processes perspective: The internal business processes perspective focuses on which processes are critical for the company to operate and need to improve to survive. Measuring these processes allows managers to record how well the organization is operating and if products are meeting customer requirements. The Balanced Scorecard encourages the company to analyze the complete life cycle of the product, putting emphasis on researching future markets and customer needs, developing quality products and providing ongoing support and services to the customers after the sale of the product. Traditional methods of measuring internal processes involved measuring the performance of the process through output, but Kaplan and Norton incorporated the innovation process as a vital component of the internal business process as it allows the organization to invest in research, design and new products to compete in emerging markets.

Learning and Growth Perspective: The learning and growth perspective is primarily focused on employees within the
Defining Innovation Goals

organization. It deals with employee training, which encourages learning, improving and innovation to meet the goals and objective of the organization. The learning and growth perspective provides the platform to successfully carry out the other perspectives in the Balanced Scorecard. The Balanced Scorecard stresses the need to invest in the future. In this perspective the need to invest in people training, systems and procedures are key to excelling in the future. An example of a balanced scorecard is shown in Figure 6.

<table>
<thead>
<tr>
<th>Perspectives</th>
<th>Objectives</th>
<th>Indicators</th>
<th>Targets</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Firm</td>
</tr>
<tr>
<td>Financial</td>
<td>Maximum Returns</td>
<td>Return on Equity</td>
<td>12%</td>
</tr>
<tr>
<td></td>
<td>Revenue Growth</td>
<td>Utilization Rates</td>
<td>7%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>% Change in Revenue</td>
<td>+11%</td>
</tr>
<tr>
<td>Customer</td>
<td>Customer Retention</td>
<td>Retention %</td>
<td>75%</td>
</tr>
<tr>
<td></td>
<td>Customer Service</td>
<td>Survey Rating</td>
<td>85%</td>
</tr>
<tr>
<td></td>
<td>Customer Relations</td>
<td>% Self Initiated Calls</td>
<td>35%</td>
</tr>
<tr>
<td>Internal Processes</td>
<td>Fast Delivery</td>
<td>Turnaround Time</td>
<td>15m</td>
</tr>
<tr>
<td></td>
<td>1st Time Resolution</td>
<td>0.68</td>
<td>0.69</td>
</tr>
<tr>
<td></td>
<td>% cost of sales</td>
<td>66%</td>
<td>64%</td>
</tr>
<tr>
<td></td>
<td>Productivity Indicator</td>
<td>77%</td>
<td>80%</td>
</tr>
<tr>
<td>Learning &amp; Growth</td>
<td>High Skill Levels</td>
<td>Skill set ratio</td>
<td>65%</td>
</tr>
<tr>
<td></td>
<td>Employee Satisfaction</td>
<td>Survey Index</td>
<td>75%</td>
</tr>
</tbody>
</table>

Figure 6: Balanced Scorecard Example

Summary

Performance indicators are a measurable goal for an organization. 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 simply present historical financial data. Indicators can either lead or lag innovation expectations and typically only seven are necessary for any team within an organization. These seven can be linked hierarchically to other indicators within the organization so that any one group is focused on no more than seven. Performance indicators are typically illustrated using performance charts and tables.

Reflections

List five ways of defining a set of innovation goals
List five key attributes of a good performance indicator
Explain why seven indicators are better than thirty
Indicate the key data points in a simple performance chart
Managing Actions

Introduction

Actions are the activities that an organization carries out to make change physically happen to products, processes and services. Actions are usually carried out in response to a stimulus such as a problem or a goal. There are a number of different types of actions including solving problems, generating ideas, managing projects and balancing project portfolios. The terms project and initiative are interchangeable. They are unique non-permanent activities that require resources — time, money and labour. Problems and ideas can be either proactive or reactive. They can react to an existing problem or they can be proactive in responding to a potential problem or goal in the future. Ideas that don’t require significant resources can be implemented as ‘quick wins’. Ideas that require significant resources can become initiatives or projects. A typical organization will have many ideas and projects active at once and at various stages of implementation. These ideas and initiatives should have a strong relationship with the goals of the organization. The entire portfolio of projects needs to be balanced to maximize short-term and long-term benefits while simultaneously optimising scarce resources.

Learning Goals

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

- Describe the problem solving process and a number of tools for solving problems systematically
- Explain idea generation and use tools for generating new ideas
- Identify broader aspects of project management appropriate to the innovation process
- Explain the procedure for project portfolio management where a group of projects are chosen to meet short- and long-term goals

Managing Actions

There are four common types of actions illustrated in Figure 7 - problems, ideas, projects and initiatives. The terms ‘initiatives’ and ‘projects’ are interchangeable. Innovation management typically involves many of each type of action. For example, organisations will have a number of projects ongoing at once. Some of these may be radical while most may be incremental. Some projects will deal with changes to processes, while others will deal with products. Project management of an individual project is one issue that needs to be addressed in organisations. Of equal importance is balancing the portfolio of projects. Problems are
Managing Innovation Actions

often regarded as the seed of innovation e.g. a problem exists with a particular product when compared with a competitor. On the other hand ideas or goals are viewed as stimulating innovation. We begin this section by looking at problem solving. Later we explore idea generation and project portfolio management.

Figure 7: Innovation Actions

Solving Problems

From time to time, problems occur with products, processes and services. Problems are identified by employees, customers and other stakeholders. Customers are an excellent source of problem identification. Not only do they experience problems but they can often predict problems in the future. They use products, processes and services to add value to their own activities and have a strong focus on any problems they encounter. The solution to a problem can be either reactive or proactive. Reactive problem solving occurs after a problem has been identified. Proactive problem solving occurs before a potential problem has occurred. The terms ‘problem solving’ and ‘corrective action’ are interchangeable.

A large number of tools can be used for documenting, analysing, ranking and illustrating problems and later identifying solutions for solving them. Table 1 below illustrates a number of problem solving and idea generation tools.

Table 1: Problem Solving Tools/Techniques


It is not possible to discuss each of these tools and techniques individually. You are encouraged to visit the internet and search for...
information on any tools or techniques that catch your interest. What follows is a discussion on some popular tools: (i) Cause-Effect, (ii) Brainstorming (iii) Affinitising and (iv) FMEA.

**Cause-Effect:** This graphical technique identifies the effect or effects of a problem. It then looks for possible causes of the effect. Causes can be grouped into key areas. One popular grouping technique is to use (i) man, (ii) machine, (iii) method or (iv) material. The possible cause can be the person, the equipment or machine that they use, the method in which they use the equipment or any materials in the process.

**Brainstorming:** Brainstorming is a technique that relies heavily on group creativity. It is particularly effective in looking in the broad direction of a problem and in developing solutions to problems that cannot be logically deduced. Brainstorming encourages the use of divergent thinking. Two basic rules apply to creative thinking, these are: (i) suspended judgement during the creation of ideas and (ii) all ideas put forward are considered.

**Affinitising:** Once ideas have been generated, the next step is to rank them. A simple technique for ranking or affinitising is to rank them according to risk and impact. Each individual can be asked to place a number from one to five for both risk and impact on each idea. Alternatively, an open discussion between groups of individuals can attempt to reach a consensus on the ranking. Once the ideas have been ranked, perhaps the top three or five can be discussed further in detail. Pareto Analysis indicates that 20% of the problems cause 80% of the effects (the 80/20 rule).

**FMEA:** Failure Mode Effects Analysis is a technique for predicting future problems or failures and them allocating a score to each problem. The technique then identifies actions that can be carried out to prevent the failure occurring. The technique is popular in product design and in processes. The technique is highly successful in assuring high quality and greater reliability of products that in turn give organisations a competitive advantage over their competitors.

**Sample:** Customers and employees at a computer chip manufacturing company complained of long delays in releasing new chips. A group of employees including managers, designers, and lead customers developed a solution using cause-effect, brainstorming and affinitising. Figure 8 illustrates the cause-effect diagram that indicates the most likely causes of the long delays. This was followed by brainstorming which identified ideas for addressing the key causes and affinitising which ranked the ideas in terms of their risk versus impact.
Managing Innovation Actions

Figure 8: Cause-Effect Diagram

Generating Ideas

Ideas occur at every step of the innovation process, in defining goals, generating actions, specifying teams and monitoring results. In this section we focus on ideas that lead to actions or projects. Some ideas occur because of serendipity i.e. an idea suddenly arises without any prompting but most ideas are planned. They occur because of a planned set of activities. Good ideas go on to become initiatives and projects that require resources — time, labour and money — and need to be scheduled. Some ideas can be implemented immediately with very few resources. These are sometimes called ‘quick wins’. Creativity is one of the first steps in the idea generation process. 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 one hundred will progress to become a solution. There are a number of ways of encouraging the idea-creation process in any organization. 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.
**Sample**: A number of tools can be used in the idea creation process. Some of these were listed in Table 1: Problem Solving Tools/Techniques. 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 or thoughts, associations between concepts, and hierarchies of concepts. These are also called tree diagrams and topic maps. Mind maps can be used for a number of problem solving techniques mentioned earlier including cause-effect diagrams and brainstorming. Figure 9 illustrates a mind map for the concept of an ‘Innovation Team’. The diagram suggests that to understand an innovation team the reader needs to understand an number of associated concepts such as ‘creativity’, ‘problem solving’ and so on.

![Figure 9: Mind Map](image)

**Sources of Ideas**

There are many sources of ideas. Sources of ideas can be divided into six areas: (i) new knowledge, (ii) ideas of customers, (iii) lead users, (iv) empathetic design, (v) invention factories and, (vi) open market innovation.

**New Knowledge**: These are ideas from employees, suppliers, distributors and individuals in the organisation. Ideas are typically generated from new knowledge and insights gained from books, magazines, competitive benchmarking, collaborative

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Managing Innovation Actions

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.

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.

Invention Factories: Invention factories are special laboratories within organisations, and those shared between 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.

Open Market Innovation: This approach to generating ideas involves purchasing and taking over other organisations that 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 organization.

Evaluation of Ideas

The most direct way of evaluating an idea is judging its merits with respect to its impact on meeting the goals of the organization versus any 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 organization. There is little point in choosing a good idea if the competencies to implement and exploit the idea are not
available in the organization. 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. 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 10. 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 that your idea 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 life cycle from purchase, delivery and use to supplements, 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.

Figure 10: Buyer-Utility Map (Kim and Mauborgne, 2000)

**Sample:** 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 11.

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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.

**Product Development**

The development of a new product can take significant time and resources to bring an initial concept to successful market launch. While certain electronics products such as the iPod may be accomplished in less than a year, the development of other products such as a new pharmaceutical drug can take up to twelve years. Time-to-market can be crucial to the success of an innovations; being ‘first to market’ provides the organization with an initial monopoly in the market place. It also emphasizes the innovative nature of the offering since other organizations have not yet managed to introduce a similar offering. Being ‘first to market’ can offer an organization the opportunity for premium pricing and ease of access to distribution channels. Delays in bringing an innovation to the market can result in reduced competitive advantage, reduced market share and inability to charge premium pricing.

The stage gate process is a powerful tool for managing the new product development process [12]. Cooper describes the stages by which products flow from concept to market as a generic stage-gate process consisting of sequential stages.
Managing Innovation Actions

- Ideation Stage
- Detailed Investigation Stage
- Development Stage
- Testing and Validation Stage
- Commercialization Stage

**Ideation Stage:** Cooper’s stages for new product development begin with an initial ‘ideation’ stage where the ideas are initially screened for suitability. If successful, the concept passes to the ‘preliminary investigation’ stage where a relatively quick and inexpensive investigation is undertaken. Following this stage, the concept passes through a second stage-gate where it is evaluated relative to other potential ideas that are proposed. If deemed inappropriate, it is abandoned; otherwise it continues to flow on to the next stage of the process.

**Detailed Investigation Stage:** at this stage, a ‘detailed investigation’ of the concept is undertaken in order to build the business case for the prospective innovation. This stage studies the concept in much more detail and tests the market and technological potential of the concept. It is in this stage that significant information is compiled concerning the concept in order to aid management decide whether the idea should flow to the ‘development stage’ or be abandoned.

**Development Stage:** the third stage of Cooper’s process, views the concept undergoing ‘development’. This is a highly expensive stage of the process as the physical product begins to become tangible. Challenges such as technological feasibility are addressed in this stage through utilizing the knowledge competence of the organization and by using ongoing experimentation and testing. This stage attempts to align the aspirations of the concept with the technological feasibility of the state of the art. The duration, expense and difficulty of this stage will depend on the relative ambition of concept.

**Testing and Validation Stage:** this stage involves tests of prototypes relative to desired performance, market expectation and production systems. Positive outcomes can result in the product flowing on to the final stage of the process, however unsatisfactory results can often cause the concept to return to the development stage for rectification of problems. Sometimes (as is the case in the pharmaceutical development process) the inadequacies highlighted during the testing and validation stage can be so significant that they result in the abandonment of the concept altogether.

**Commercialization Stage:** during this stage the production plan is implemented to allow increases in scale of production to supply the
Managing Innovation Actions

If the development stage has not taken adequate cognizance of production and market needs during the determination of the final design, then difficulties can be encountered. This stage ensures full production is achievable given as quality, cost and time parameters.

Figure 12: Stage Gate Process

Stage Review: at each stage gate (Figure 12), the project team and senior management review the progress of the project during the previous stage. This review results in a decision as to the fate of the project. The success of a project depends exclusively on what happens inside the project, for example, is the project meeting its goals and progressing according to plan? If the outcome of the review is satisfactory, then it is allowed to proceed to the next stage of the process. Otherwise the decision can be made as to whether the project should return to the previous phase for further development or be abandoned altogether. The decision to ‘kill-off’ the project completely can be taken in scenarios where initial development and testing has highlighted unforeseen challenges that alter the attractiveness of the particular project.

Project Management

A project represents a large investment of time, money and resources. Planning a project effectively can maximize its positive contribution to the company's goals. Good planning is fundamental to the financial considerations of a project. It also has organizational implications and is crucial to the scheduling of resources and the control of progress and costs. Delays in implementing projects can be costly and can result in delays in payback that fundamentally affects the original cost justification. Effective planning needs to take into account the integration of existing and interfacing systems when formulating an execution plan for a project. A project plan acts as a map to guide people on
Managing Innovation Actions

the project team. Principle elements in the planning of a project are:

- Work packages
- Tasks
- Deliverables
- Milestones or Stages
- Resources

**Work packages:** These are a group of tasks, deliverables and milestones. Projects are often divided into a number of interrelated work packages to facilitate planning and management of the project implementation. These work packages typically include the deployment or subset of project objectives. Based on the Objectives, the project is divided into tasks. **Error! Reference source not found.** illustrates one work package from a project that has eight work packages in total. This work package outlines the tasks involved in managing the project. For better perspective on this work package see Table 2.

**Table 2: Work package Detail**

<table>
<thead>
<tr>
<th>Workpackage</th>
<th>Workpackage Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Title:</strong> Project Management</td>
<td></td>
</tr>
<tr>
<td><strong>Leader:</strong> R1</td>
<td></td>
</tr>
<tr>
<td><strong>Number:</strong> WP1</td>
<td></td>
</tr>
<tr>
<td><strong>Start Month:</strong> 0</td>
<td></td>
</tr>
<tr>
<td><strong>Objectives</strong></td>
<td>To manage the proposed project in a sound manner, addressing such issues as progress monitoring, reporting, reviews, organisation, and communication.</td>
</tr>
<tr>
<td>O1.1: Effective Project Management</td>
<td></td>
</tr>
<tr>
<td>O1.2: Project Control and Reporting</td>
<td></td>
</tr>
<tr>
<td>O1.3: Liaising with Project Stakeholders</td>
<td></td>
</tr>
<tr>
<td><strong>Description</strong></td>
<td>Description of work will be the overall responsibility of the co-ordinator, and is defined to be one workpackage on its own. The work in this workpackage will establish an organisational structure for the project, typically consisting of a Project Team, a Project Chairman, a Technical Project Manager, and Workpackage Leaders. Furthermore, to establish a management structure for the project. The workpackage contains the following tasks:</td>
</tr>
<tr>
<td><strong>Tasks</strong></td>
<td>T1.1: Establish Project, Consortium Agreement, Team Portal</td>
</tr>
<tr>
<td></td>
<td>T1.2: Manage meetings and goal attainment</td>
</tr>
<tr>
<td></td>
<td>T1.3: Undertake progress and cost reporting to the EC.</td>
</tr>
<tr>
<td><strong>Deliverables</strong></td>
<td>D1.1: Project Portal</td>
</tr>
<tr>
<td></td>
<td>D1.2: Signed Consortium Agreement</td>
</tr>
<tr>
<td></td>
<td>D1.3: Progress Report #1</td>
</tr>
<tr>
<td></td>
<td>D1.4: Progress Report #2</td>
</tr>
<tr>
<td></td>
<td>D1.5: Final Report</td>
</tr>
<tr>
<td><strong>Milestones</strong></td>
<td>M1.1: Completed portal</td>
</tr>
<tr>
<td></td>
<td>M1.2: Completed consortium agreement and other contractual documents</td>
</tr>
<tr>
<td></td>
<td>M1.3: Submitted progress report #1</td>
</tr>
<tr>
<td></td>
<td>M1.4: Submitted progress report #2</td>
</tr>
<tr>
<td></td>
<td>M1.5: Submitted progress report #3</td>
</tr>
</tbody>
</table>
Managing Innovation Actions

Tasks: These are the principle actions of a project. These actions are constrained by the project goals and resources. Their results are monitored and deployed against project goals. See examples in Table 3.

Deliverables: These are actions that typically result in the production of a document or event and typically occur at a milestone or stage. They are usually assigned to a single resource or leader in the project.

Milestones or Stages: These are sub actions that mark the end of a task or other event such as a deliverable in the implementation of the project.

Resources: These are the individuals or teams allocated for the execution of various tasks. Resources are usually expressed through individual names or teams and the number of man-days or man-months allocated to executing the task.

Table 3: Man-month Allocation

<table>
<thead>
<tr>
<th>Code</th>
<th>Workpackages and Tasks</th>
<th>Leader</th>
<th>R1</th>
<th>R2</th>
<th>R3</th>
<th>R4</th>
<th>R5</th>
<th>TOTAL</th>
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<td>WP1</td>
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<td>R1</td>
<td></td>
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<td></td>
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<td>T1.1</td>
<td>Establish Project, Consortium Agreement, Team Portal</td>
<td>R1</td>
<td>3</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>T1.2</td>
<td>Manage meetings and goal attainment</td>
<td>R1</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T1.3</td>
<td>Undertake pro</td>
<td>R1</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WP2</td>
<td>SOTA &amp; Best Practice</td>
<td>R2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>18</td>
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<tr>
<td>T2.1</td>
<td>State of the art in intra/inter enterprise constellations</td>
<td>R2</td>
<td>2 4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T2.2</td>
<td>Best practice in supporting ICTs across industrial sectors</td>
<td>R2</td>
<td>2 4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T2.3</td>
<td>Learning and Innovation for Virtual Teams</td>
<td>R3</td>
<td>2 4</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>WP3</td>
<td>Innovation Processes</td>
<td>R4</td>
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<tr>
<td>T3.1</td>
<td>Structure and typology in portfolio, program and project management</td>
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<td>Develop systems model for distributed innovation management</td>
<td>R4</td>
<td>2 1 4</td>
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<td>WP4</td>
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<td>R3</td>
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<td>T4.2</td>
<td>Testing and validation of learning model</td>
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<tr>
<td>WP5</td>
<td>Reference Architectures</td>
<td>R2</td>
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<td>Reference Architecture Requirements Definition</td>
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<td>Developing Draft Reference Architecture</td>
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<tr>
<td>T5.3</td>
<td>Validation of Reference Architecture</td>
<td>R2</td>
<td>2 4</td>
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<td>Ontology &amp; Semantics</td>
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<td>Review of relevant international standards and ontology languages</td>
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<td>T6.2</td>
<td>Design of an ontology model for innovation</td>
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<td>2 2</td>
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<td>WP7</td>
<td>Prototyping and Design</td>
<td>R1</td>
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<td>T7.1</td>
<td>Development of tool for programme innovation management</td>
<td>R2</td>
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<tr>
<td>T7.2</td>
<td>Development of Innovation Learning model</td>
<td>R3</td>
<td>1 2 4</td>
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<td></td>
<td></td>
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<tr>
<td>T7.3</td>
<td>Development of toolset and portals for distributed innovation management</td>
<td>R1</td>
<td>4 2 2 2</td>
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<tr>
<td>WP8</td>
<td>Dissemination and Exploitation</td>
<td>R1</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td>14</td>
</tr>
<tr>
<td>T8.1</td>
<td>Organise four regional dissemination workshops across Europe</td>
<td>R2</td>
<td>2 2 1 1</td>
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<tr>
<td>T8.2</td>
<td>Organise a number of focus exploitation workshops</td>
<td>R2</td>
<td>2</td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>T8.3</td>
<td>Development of Exploitation Plan</td>
<td>R1</td>
<td>2 1 1</td>
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</tr>
</tbody>
</table>

41 32 29 21 7 142

Man-Months
The intention of project planning is to smooth the path of an innovation from conceptualization to accomplishment. Planning lays the foundations for co-ordination and control of a project and can help to anticipate trouble and delays.

**Project Scheduling**

A schedule is the conversion of a project action plan into an operating timetable. It serves as a fundamental basis for monitoring and controlling project activity and, taken together with the plan and budget, is probably the major tool of the management of 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 organizations and many software tools now exist to support the creation and editing of Gantt charts. Displayed against a horizontal time scale the Gantt chart shows planned and actual progress for a number of tasks. It takes the form of a bar chart which provides a graphical picture of a schedule. On a Gantt chart the vertical axis indicates the activities to be carried out and the horizontal axis indicates the time. It is an effective and easy way to indicate the actual current status for each of a set of tasks compared to the planned progress for each item of the set. The Gantt chart can be useful in tracking dispatching, sequencing and reallocating resources among tasks. A simple Gantt chart is illustrated in Table 4. The activities used in this Gantt chart are the generic activities listed earlier.

**Table 4: Gantt Chart**

<table>
<thead>
<tr>
<th>Code</th>
<th>Workpackages and Tasks</th>
<th>Leader</th>
<th>Year 1</th>
<th>Year 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>WP1</td>
<td>Project Management</td>
<td>R1</td>
<td>Y1Q1</td>
<td>Y2Q1</td>
</tr>
<tr>
<td>WP2</td>
<td>SOTA &amp; Best Practice</td>
<td>R2</td>
<td>Y1Q2</td>
<td>Y2Q2</td>
</tr>
<tr>
<td>WP3</td>
<td>Innovation Processes</td>
<td>R3</td>
<td>Y1Q3</td>
<td>Y2Q3</td>
</tr>
<tr>
<td>WP4</td>
<td>Learning and Innovation</td>
<td>R4</td>
<td>Y1Q4</td>
<td>Y2Q4</td>
</tr>
<tr>
<td>WP5</td>
<td>Reference Architectures</td>
<td>R5</td>
<td>Y1Q1</td>
<td>Y2Q1</td>
</tr>
<tr>
<td>WP6</td>
<td>Ontology &amp; Semantics</td>
<td>R1</td>
<td>Y1Q2</td>
<td>Y2Q2</td>
</tr>
<tr>
<td>WP7</td>
<td>Prototyping and Design</td>
<td>R2</td>
<td>Y1Q3</td>
<td>Y2Q3</td>
</tr>
<tr>
<td>WP8</td>
<td>Dissemination and Exploitation</td>
<td>R3</td>
<td>Y1Q4</td>
<td>Y2Q4</td>
</tr>
</tbody>
</table>
**Managing Innovation Actions**

**Project Portfolios**

Most ideas transform into projects that demand scarce resources that need to be managed so that the organisation can optimise its return on investment. 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 would be implemented or not. There are four key approaches for portfolio management:

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

**Maximising Value of Portfolio:** This approach involves placing a value on each of the projects in the portfolio. ‘Payback’ is a simple yet effective way to place value on a project. This approach suggests reviewing projects simply in terms of their cost versus revenue potential. An alternative approach 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. The total scores for each project in the portfolio are then compared.

**Creating the Right Mix of Projects:** The previous approach ‘maximizing value’ often leads to only low-risk projects in the project portfolio. Low risk projects have predictable but often medium benefits. A complementary approach is to develop a mix of high-risk and low-risk 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 13).
Managing Innovation Actions

Figure 13: 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 a name representing their relative meaning.

Maximising Alignment with Goals: Maximising Alignment is an objective that selects projects that are aligned with particular goals. A powerful but simple technique used here is the matrix diagram (see Figure 18). The matrix diagram places the portfolio of initiatives or 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.

Optimising Resources: This is the process of balancing funds, people and skills required by the portfolio of projects. There is often a finite amount of money available for investment. In addition, the funding available can change. For example if revenues are particularly low for the organisation, then overall expenditure on innovation can be suddenly reduced. This can mean shelving particular low-ranked initiatives. The total number of person-hours and skills available for executing initiatives 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.

All four approaches discussed above can be used together to generate knowledge that can be used to decide which projects to pursue. Once a portfolio has been chosen there are two approaches
Managing Innovation Actions

for reviewing a portfolio while it is in the process of being executed: (i) the Gates Dominate approach and the (ii) Portfolio Dominates approach.

**Gates Dominate:** This review 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 view is sacrificed in favour of in-depth review of individual projects. The approach is suitable where portfolios are relatively static and unchanging and is typically found in large mature businesses.

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

**Summary**

Problems occur to products, processes and services regularly now and in the future. When these problems are identified either by employees, customers or other stakeholders, they need to be recorded and managed. Not all problems are important. Typically 20% of problems cause 80% of the negative effects. Ranking problems helps. Ideas evolve from problems and well-defined goals. Various stimuli can initiate the creativity process including new knowledge, ideas from customers and research laboratories. Most ideas are planned and many ideas are merged, postponed or rejected. The principal way to measure the potential success of an idea is to compare it with the goals of the organization. Organisations typically implement ideas through a portfolio of projects. The primary objective of portfolio management is to create a balance around issues such as cost-benefit, risk versus reward, and goal attainment. In dynamic organisations, where goals are changing, portfolio management is often more important than managing individual projects.

**Reflections**

* List three tools for problem solving or idea generation
* What are the six principal sources of ideas for any organization?
* Name the six utility levers that can be used by customers in evaluating the value of a product, process or service
* What are the four key overlapping strategies used in selecting projects in portfolio management?
Empowering Teams

Introduction

In previous sections we looked at the first two of five key areas surrounding the innovation funnel — goals, actions, teams, results and community. Goals set the objectives for the generation of actions by various individuals in the organisation. In this section we will look at the role that teams play in the innovation process. The first part looks at building teams — how to create team structure and foster team behaviour that leads to more effective innovation. Next we look at some of the concepts of leadership and the process of creating an innovation culture. We then explore some ideas around motivation and reward, and in particular we look at ways to tie an individual’s goal into the overall goals of the organisation. The final part of this section looks at organisational learning, where organisations can learn from mistakes and continue to improve the innovation process itself.

Learning Targets

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

- Define innovation teams structure and behaviour and explain how to build a team culture within the organisation
- Explain the importance of leadership in innovation
- Explore various ways of increasing motivation through intrinsic and extrinsic rewards
- Explain the need to create a learning organisation for sustainable innovation

Empowering Teams

There are two major resources used in the innovation process. The first is funding and the second individuals, and in particular teams. Individuals are necessary for setting goals, generating ideas, relating ideas to goals and executing projects. Individuals have many different skills and perspectives to bring to the innovation process. They also have differing levels of engagement and motivation. There are a number of key techniques for increasing the engagement and motivation of individuals in the innovation process. Some of them involve managing the information and structure surrounding teams. The most important techniques address the behaviour and motivation of teams. In terms of information and structure, we can visualise the innovation funnel as comprising a number of knowledge elements as illustrated in Figure 14. These are Individuals, Responsibilities, Teams, Workgroups and
Empowering Innovation Teams

Appraisals. Other knowledge elements can be easily added in Figure 14 and include the ‘Skills’ of various individuals and training ‘Courses’ available for individuals to complete. This section looks at each of these knowledge elements in four separate but interrelated discussions on leadership, teams, motivation and learning.

![Figure 14: Innovation Teams](image)

**Leading Innovation**

Leadership is the ability to influence a team 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.

Leadership is clearly important for good innovation. What is not so clear is what attributes a good leader needs to have. The following is a list of attributes identified as being important for successful leadership:

- Ambition and energy
- The desire to lead
- Honesty and integrity
- Self-confidence and intelligence
- Job-relevant knowledge

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Empowering Innovation Teams

Highly self-motivated

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 organization. A good leader in one organization may not be a good leader in another. It is this latter issue —organization and in particular how an organization changes — that suggests that good leadership requires dynamism and the ability to change.

Table 5 illustrates two main styles of leadership — transactional and transformational. 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 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 products, processes and services and the innovation process itself.

Table 5: 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>

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

Leadership Culture

Setting goals and generating ideas are two elements of a complex environment for innovation. New ideas will only succeed if the

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organizational culture is right to allow them to grow and prosper. There are many factors necessary for developing an effective innovation culture in any organization, including the following:

- Risk taking is encouraged and accepted
- New ideas are welcomed
- Information exchange is open and shared
- Extensive and uncontrolled access to new knowledge
- 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 relationship needs to be integral part of the skill-set of every innovation leader.

**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 swiftly.

**Information Exchange**: Information and knowledge within an organisation is 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?

**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.

**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 egos and sensitivities of the individuals who create them.

**Reward and Recognition**: Innovation and creativity demand appropriate reward and recognition for the individual or team that creates an idea. Creative energy is easily dissipated. Reward and recognition replenish this energy in the minds of individuals. Rewards can be either intrinsic (e.g. self actualisation) or extrinsic (e.g. a bonus) or both.
Empowering Innovation Teams

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 is:

- 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 not only want an appropriate increase in autonomy and discretion, they also need to feel that their contribution is meaningful and valued. They want the option of continuing learning on the job i.e. increase their enablement and knowledge that 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. 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 more training and experience.

One of the first steps in empowering individuals is to assign them 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 organization 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 Innovation Teams

Individuals versus Teams

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 can spark 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 are assigned to teams. These mentors are often senior members in the organisation 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.

Building 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. Most
organisations now operate a type of matrix organizational structure where individuals report on a permanent basis to permanent teams but also report on a temporary basis to non-permanent team. 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.

Management teams are another example of a permanent team. There are a number of different types of non-permanent project teams.

**Lightweight Project Team:** 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 mainly with the functional managers. The project manager typically has low status within the organization. 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 Team: 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 organization 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: 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 organization. This team also typically resides in the same office environment to allow complete dedication to achieving the project’s goals. Tiger team organization teams are deployed for projects which have a strategic significance for the organization 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.

All team both permanent and non-permanent e.g. management teams, departments and project teams can be called innovation teams. In the case of management teams, the innovation process is concerned with changes at a high level across the entire organisation. In the case of departments, the innovation process is concerned with changes within the department that add value to the departments’ customers. In the case of project teams, the innovation process is concerned with the goals and actions of the project and the precise change it is intended to make. Clearly all of the innovation activities in all three teams are interrelated.

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 4.2.
Empowering Innovation Teams

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 in to ‘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 i.e. fully empowered in figure 4.2. A key goal for every organization is to determine the correct mix of empowerment versus enablement for each individual project.

Openness and Consideration: The level of openness and consideration used by individuals in a communication is illustrated in Figure 16.
Empowering Innovation Teams

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.

Motivating Performance

One of the most practical ways to 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 and performance indicators. If the individual is made responsible for achieving these goals, then it can act both as a motivator and later on as a reward. There are many intrinsic and extrinsic means of motivating individual performance. Intrinsic techniques, such as giving the individual autonomy and discretion are generally deemed the most productive. Extrinsic techniques, such as linking performance to pay and other rewards, are also necessary incentives for the individual and help them to take more risks for the organisation.

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. Similarly, 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.

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. One compromise argues for a performance appraisal system for individuals with no reward, coupled with a group-based reward
Empowering Innovation Teams

system (similar to gain sharing) when a reward is shared equally across a team.

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 booklet, individuals can find themselves motivated to contribute to specific goals within the following areas:

- 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 indicators or a subset of the main indicators for the organisational 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 include: 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 and 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;
Empowering Innovation Teams

Self-Awareness; Self-development; Support; Training; Personal Integrity; Problem Solving; Responding to Feedback; Self-confidence and Teamwork.

The performance appraisal system also typically involves an opportunity for the individual to add other achievements outside of the objectives agreed. The whole process is formally recorded and entered into the individual’s employment record.

Summary

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 and recognises the contributions of individuals. Each organization consists of permanent and non-permanent teams. Individuals can be members of more than one team. Teams have a number of attributes, but in particular they are a group of individuals with a common purpose. Extrinsic reward involves developing a system where the individual’s performance can be linked to the performance of the organisation. The ability to learn faster than your competitors may ultimately be the only sustainable competitive advantage. Sustainable competitive advantage requires continuous innovation by organisations where individuals change regularly and innovations are planned regularly. Organisations need to create a learning culture that allows individuals take risks, conduct experiments, implement actions and most importantly reflect on the lessons learned. Organisations need to become more learning centred.

Reflections

Why is transformation leadership more desirable for effective innovation?
What are the two basic types of team?
Name three techniques for rewarding individuals with money.
What is a learning organisation?
Monitoring Results

Introduction

One of the primary causes of failure in the innovation process is ‘poor monitoring of results’. Results are defined in the dictionary as the outcome of an effort. Earlier sections discussed three types of efforts – the definition of goals, the management of actions and the empowerment of teams. This section continues these discussions by connecting goals, actions and teams together. The first part of this section looks at some simple techniques for reporting results. The ‘traffic lights’ system is now a simple and popular technique for indicating the progress of goals, actions or teams. Then we look at ways to map the connections between different lists or logs of information. The matrix diagram is a powerful yet simple decision support tool for assuring alignment between goals and actions and viewing the threads that link them. Finally, we look at various issues around managing innovation meetings.

Learning Goals

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

- Illustrate a simple way that results of goals, actions and teams can be tracked
- Map the connections between different lists or logs of innovation information
- Use techniques for managing innovation meetings and focusing on exceptions

Monitoring Results

The innovation funnel describes the innovation process as comprising four flows of structured information — goals, actions, teams and results. Results represent the progress, connections and outcome of goals, actions and teams. When monitoring the results of goals, actions and teams, three key types of information become important — progress, connections and exceptions (see Figure 17).
Progress

An innovation plan comprises lists or logs for each of the knowledge elements in Goals, Actions, Teams and Results e.g. ‘objectives’, ‘projects’, ‘ideas’. The innovation plan is a view of the future and the actions that will take an organisation towards their goals. There are a wide variety of techniques used to signal the progress of the entries in each of the logs in an innovation plan. One simple and easy-to-deploy technique is the traffic lights metaphor.

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. Table 6 illustrates the three states and their possible meaning.

Table 6: Traffic Lights

<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>
<tr>
<td>Blue</td>
<td>Activity completed</td>
<td>Activity completed</td>
<td>Blue check mark</td>
</tr>
</tbody>
</table>
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 to discuss the activity. If the light is red, then the individual responsible is signalling a need to discuss the activity within the team and not that the activity is performing poorly. 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 becomes a red circular unhappy face or ‘smiley’ (see Table 6).

**Connections**

All of the entries in the logs described in earlier sections (e.g. individuals, indicators, ideas, projects, etc.) can be connected to each other. For example indicators can be connected with projects and visa versa. A connection diagram or matrix can be created between entries in two lists. Building connections is a powerful way to indicate the results of the innovation activity and to decide what activities need to be executed. The matrix diagram is a decision support tool that facilitates systematic analysis of the relationships between two or more sets of data. Figure 18 illustrates a simple matrix diagram for two logs — goals and actions. It also illustrates the results of each entry in the logs.

**Figure 18: Matrix Diagram**
**Monitoring Innovation Results**

**Types of Diagram:** There are a number of types of matrix diagram depending on the logs selected. Table 7 illustrates most of the possible matrices that can be created among all of the knowledge elements discussed around the innovation funnel.

<table>
<thead>
<tr>
<th>Table 7: Types of Matrix</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Goals versus Goals</strong></td>
</tr>
<tr>
<td>Objectives versus Indicators</td>
</tr>
<tr>
<td>Indicators versus Requirements</td>
</tr>
<tr>
<td>Objectives versus Requirements</td>
</tr>
<tr>
<td><strong>Objectives versus Requirements</strong></td>
</tr>
<tr>
<td><strong>Goals versus Actions</strong></td>
</tr>
<tr>
<td>Objectives versus Initiatives</td>
</tr>
<tr>
<td>Objectives versus Ideas</td>
</tr>
<tr>
<td>Indicators versus Initiatives</td>
</tr>
<tr>
<td>Indicators versus Ideas</td>
</tr>
<tr>
<td><strong>Goals versus Teams</strong></td>
</tr>
<tr>
<td>Objectives versus Responsible</td>
</tr>
<tr>
<td>Indicators versus Responsible</td>
</tr>
<tr>
<td><strong>Objectives versus Responsible</strong></td>
</tr>
<tr>
<td><strong>Etc.</strong></td>
</tr>
<tr>
<td><strong>Actions versus Teams</strong></td>
</tr>
<tr>
<td>Initiatives versus Responsible</td>
</tr>
<tr>
<td>Initiatives versus Team</td>
</tr>
<tr>
<td><strong>Initiatives versus Team</strong></td>
</tr>
<tr>
<td><strong>Etc.</strong></td>
</tr>
<tr>
<td><strong>Teams versus Teams</strong></td>
</tr>
<tr>
<td>Individuals versus Skills</td>
</tr>
<tr>
<td>Individuals versus Courses</td>
</tr>
<tr>
<td>Leader versus Teams</td>
</tr>
<tr>
<td><strong>Etc.</strong></td>
</tr>
<tr>
<td><strong>Actions versus Actions</strong></td>
</tr>
<tr>
<td>Ideas versus Ranking Criteria</td>
</tr>
<tr>
<td>Problems versus Risk</td>
</tr>
<tr>
<td>Projects versus Schedules</td>
</tr>
<tr>
<td><strong>Etc.</strong></td>
</tr>
</tbody>
</table>

**Connections between Matrices:** Matrices can also be related to each other in a parent-child relationship. Focusing on the matrix in Figure 18, 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 project initiatives in a third matrix and so on.

**Exceptions**

All of the activities described in earlier sections (e.g. indicators, ideas, projects, etc.) can be monitored for progress as they are being executed. Positive exceptions are those activities that have a green signal. Negative exceptions have a red signal. The ways in which exceptions can be indicated and interpreted can be agreed by the innovation team. Meetings can be managed in such a way that focus is always kept on positive or negative exceptions.

**Meetings**

Meetings can be an expensive waste of time and potential source of conflict. On the other hand, they can be a powerful way to communicate goals, solve problems and motivate participants. To achieve positive results, meetings need to have a focus that appeals to participants and who feel they can make a meaningful
contribution. Participation and engagement of each individual is one of the keys to success in a meeting. Other issues include (i) the roles that certain individuals play at meetings, (ii) meeting agenda, (iii) opening and closing a meeting and (iv) time management.

Roles: There are a number of potential roles at each meeting. Meetings will typically have a chairperson, a reporter and sometimes a facilitator. The purpose of the chairperson is to lead the meeting and make sure that the agenda is implemented and adjusted accordingly. The chairperson is ultimately responsible for conducting the meeting in a timely fashion. It is good practice for each person at a meeting to ‘talk through the chair’ initially rather than address other individuals at the meeting.

Agenda: There can be fixed agenda, suggested agenda, hybrid, or exceptions only. Typical fixed agenda for an innovation team include: (i) Previous Minutes, (ii) Matters Arising, (iii) Goals, (iv) Actions, (v) Any Other Business. ‘Matters arising’ refers to the status of actions agreed in the minutes that will not otherwise arise under the normal agenda. Since many actions will arise under the normal agenda it is important that this item be managed sensibly.

Opening and Closing a Meeting: Always start a meeting on time. This respects those who showed up on time and reminds latecomers that punctuality is important. Meetings should begin by reviewing the agenda and giving participants a chance to understand all the major items to be discussed.

Time Management: This need not be a major challenge. Consider the time requirements in advance of a meeting and once a time slot is decided, communicate this in advance of the meeting with the agenda. Each item then needs to be allocated time within this time slot. A good chairperson will judge where allocated times can be shortened or lengthened during the meeting. Largely, meetings should be kept formal regarding timekeeping and always finish on time except in exceptional circumstances.

Summary

Tracking information on the results of activities is a critical part of effective innovation management. Status signals allow individuals to draw attention to poorly performing activities and encourage views on discussing corrective actions. Matrices are a simple yet powerful decision support tool for understanding relationships between two or more lists of data e.g. Goals vs. Actions. In its simplest form, the matrix is a visual representation of where relationships exist, where they don’t exist and perhaps where they should exist. Proper meeting management is a basic yet fundamental technique for communicating goals, actions and
Monitoring Innovation Results

results. Face-to-face meetings are a rich form of communication, motivation and understanding. Conducting effective meetings requires attention to creating the agenda, selecting the right people to attend, effective time management, and creating meeting minutes. It is important to follow up on actions agreed at a meeting.

Reflections

1. Why do you feel it is important to have simple monitoring of results?
2. Name all of the possible matrix diagrams that can be constructed for a log of indicators, a log of projects and a log of individuals.
3. Review documentation available on the internet for managing meetings more effectively.
Conclusions

Innovation is the process of making changes to something established by introducing something new. Innovation applies to every organisation — profit and non-profit. Many innovation teams can exist within an organisation, from management teams and departments to project teams and even individuals. Innovation can occur to products, processes and services. The degree of change can be incremental, radical or disruptive.

Innovation management is about putting a process in place for managing innovation. Every organisation, large and small, department or project team, will develop its own process. Common features of every process will include elements for defining goals, managing actions, empowering teams, monitoring results and building communities. Defining innovation goals can be seen as the starting point for innovation that informs individuals about the direction of change the organisation is willing to take. It leads to goal-centred ideas and projects that make change physically happen.

Innovation actions such as ideas or projects are about discovering ideas for innovation that meet goals and to do this on a continuous basis. Problem solving that includes both small and large changes to existing products and processes are an important part of this process. Idea generation can come from a number of sources including lead users and employees. Project portfolio management is a process of balancing the portfolio of projects between potential risk and potential benefit. High risk projects can also lead to high benefits. Individuals staff the innovation effort in organisations both at a leadership and operational level. Managers increasingly depend on other staff to generate and realise ideas. A key mechanism for engaging and motivating staff is linking the goals of the individual with the innovation goals of the organisation.

Monitoring innovation results is a critical part of effective innovation management. Progress signals draw attention to poorly performing activities and encourage views when discussing corrective actions. Matrices are a simple yet powerful decision support tool for understanding connections between two or more entries. Face-to-face meetings are a rich form of communication, motivation and understanding.
Applying Innovation, David O’Sullivan and Lawrence Dooley, Sage Publishing


Mastering the Dynamics of Innovation, James Utterback, HBS Press, 1996.


