

# The Role of Innovation

*'innovation – n., introducing something new.'*

*(Oxford English Dictionary)*

## Introduction

Innovation, innovation . . . innovation. There have been countless management books and articles published in recent years on the need for companies to become more innovative. It is also widely recognized that, without innovation, companies will quickly lose their competitive edge. Peter Drucker has stated that although the importance of innovation is clear, how to achieve it remains a largely unanswered question.<sup>1</sup> In practice, recognizing the need to become more innovative and achieving it are two vastly different things, as many managers have realized. Increasing the capacity of an organization to be innovative – whether it is in the manufacturing or the service sector – is a real challenge. Consequently this book concentrates on presenting leading-edge techniques and examples of how to meet the challenge of developing and implementing an innovation strategy.

This book was written to meet the needs of MBA students following courses on the strategic management of innovation, or conducting in-company projects related to innovation management. The content of the book will also be very relevant to managers in either the service or manufacturing sectors. Specifically, it addresses how to develop and successfully implement an innovation strategy. It provides both MBA students and managers with selected tools and techniques and examples of managing innovation, which are based on the findings of the latest management research. The choice of which tools and techniques to present was based not only on an extensive review of the literature but also on the authors' own experience in industry, teaching and research. In making these choices we have focused on the approaches that really can improve the process of innovation management.

Managing innovation is complex and so there are no 'quick fixes'. The challenges with managing innovation are also compounded by the fact that many ideas that are effective in one organization cannot be easily transferred; managers must adapt them to the situation their company faces. This book describes the results of management research and it does not try to oversimplify the issues. Where the results of research are ambiguous, or solutions to innovation problems are difficult to manage, these are clearly identified.

Companies aiming to increase their innovation levels need to improve the management of a number of areas, including the generation of ideas and their

quick implementation. In this sense, innovation management is like competing in an event like the Olympic pentathlon; excellent performance in one discipline alone will not guarantee a gold medal. Too many companies have focused on just one area of innovation management – for example on improving new product development – when there are other aspects that are equally important. Leading companies take a broad view of innovation management, considering a range of issues from idea generation, to implementation, to business culture. We have categorized the main issues into five different areas, which we will refer to as the Innovation Pentathlon Framework. This framework, which is presented in this chapter, forms the structure of the book.

This chapter introduces the role and characteristics of innovation, and the ‘art’ of managing innovation. It covers issues that are equally important to companies in both the service and manufacturing sectors, including:

- ▶ The drivers of the need for innovation.
- ▶ Characteristics of innovation.
- ▶ An overview of the management research on innovation.
- ▶ The Innovation Pentathlon Framework.
- ▶ The structure of this book.
- ▶ A detailed case study on NTT-DoCoMo, a Japanese company in the service sector, which shows how a broad approach to innovation can lead to successful market segmentation.

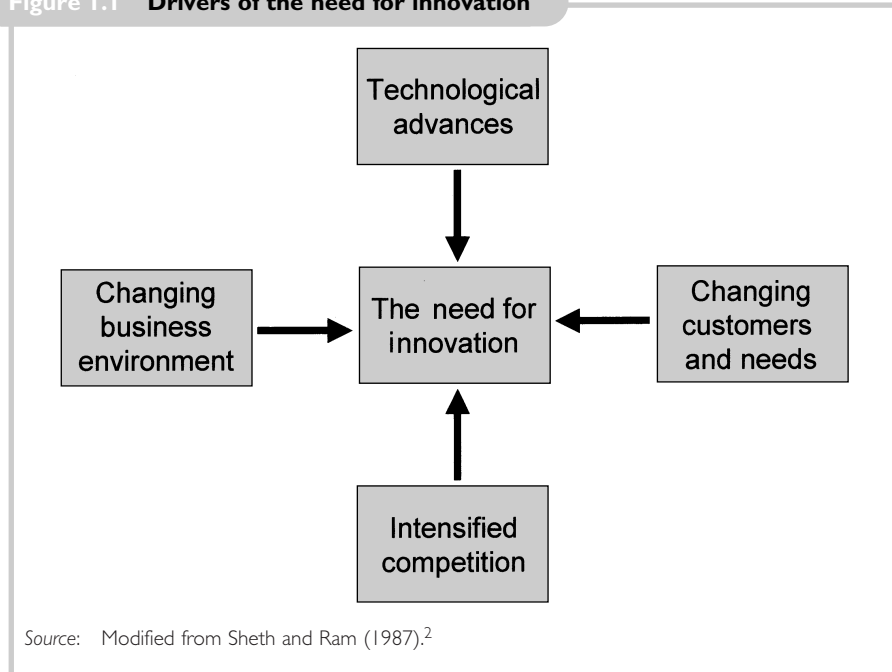
## **Innovation Drivers**

Four main factors drive market change and, in combination, create the need for innovation. Figure 1.1 shows these to be: technological advances, changing customers, intensified competition and the changing business environment.

## **Technological Advances**

The rate at which knowledge is being created has accelerated and there are numerous examples of where new technologies are having a major influence on markets. For instance, logistics will be revolutionized by RFID technology – radio frequency identification labels – which automatically transmit information about the nature and location of articles. New technologies can also create new industries and both biotechnology and multi-media have created significant employment over the last decade.<sup>3</sup> Companies need to constantly monitor new technology, as it may influence or potentially transform their markets. Existing technologies must also be considered, as today these are being more widely applied. For instance, sophisticated electronics are now an important aspect of car design. With such a vast array of technological developments taking place, even multinational companies that used to conduct all their own basic research are finding that they cannot keep abreast of developments, using internal resources alone. This means organizations need to become good at tracking the

Figure 1.1 Drivers of the need for innovation



progress of a wide range of technologies. This includes monitoring both the performance of the technologies they currently use and those which may replace existing technologies.

Technology is equally important for service companies and R&D is increasingly having a major impact on how service companies do business. For example, banks are developing technologies that will allow them to have customized services for specific customer segments. Fedex, the leading courier services company, has long recognized the importance of investing in technology and was at the leading edge of the development of hand-held bar-coding devices, which enabled them to provide the first parcel tracking capability. Bank of America and some other service organizations have created innovation departments to monitor new technology and test it with actual customers (see box case: 'Metro's Future Store').

#### Box case 1.1 Metro AG's 'Future Store' – prototyping a supermarket

Technology can help companies in the service sector make it much easier for their customers to receive a service and reduce costs. Take the retail trade, where RFID 'smart-tag' technology is poised to make a big impact. Chip manufacturer Intel and supply-chain software giant SAP have joined forces with the world's fifth largest retailer, the German company Metro AG, to create a fully running prototype of the supermarket of the future, in the small town of Rheinberg, Germany.<sup>4</sup>

Products in the supermarket are all labelled with RFID in order to automate stock-keeping and make shopping easier for customers. Each shopping trolley has a touch screen computer with a scanner and, as the customer selects each item, it is scanned in. The computer displays a range of useful information for the customer. This includes detailed product information on the item scanned, the total amount spent, special offers, the customer's 'standard' shopping list, and a map with the customer's position in the store. One big advantage is that the items in the trolley do not need to be unloaded at the cashier's desk and this saves time for the customer. The trolley's computer automatically indicates the total amount to be paid and, having paid the cashier, the customer can simply push their trolley to their car. Queuing is virtually eliminated.

Metro has named the project the 'Future Store Initiative' and through the extensive use of technology is looking for major improvements in supply-chain efficiency. The main limitation at the moment is that smart tags cost 0.5 euros each and are therefore too expensive to be used for every individual item in every supermarket. The cost of tags is expected to fall quickly, though, as they are more widely used.

Manufacturing companies often use prototypes to gain detailed customer feedback on new products. Extending the idea to the testing of a new service concept is a bold approach that few service companies have yet contemplated. Metro's prototype is helping the company to identify: 'real advantages for both the retail industry and consumers'.<sup>5</sup> And the rollout of the concept across other locations in Germany is expected soon.

### **Changing Customers and Needs**

The second driver of innovation is the changing characteristics and requirements of customers. The demographics for the next 50 years show that many markets will evolve. For instance the aging population in many countries will have different requirements, and the size and nature of many consumer markets will change. In contrast, other markets (for example Southeast Asia) are largely made up of young consumers with different aspirations. The earnings in many newly industrialized countries will soar (as short-term economic difficulties are weathered) and demand for particular products and services will consequently develop. The Whirlpool Corporation has recently launched the 'Ideale', the world's cheapest automatic washing machine, which retails at around \$150 in countries such as Brazil and China.<sup>6</sup>

Changing customers also means that traditional market segments are disappearing or fragmenting and companies will need to adjust their product ranges accordingly – for example, car manufacturers now target over 15 key segments in the USA, as opposed to only five in the late 1960s. Contrast this to the type of market faced by Henry Ford! At the same time, there are additional pressures such as customer demand for more environmentally acceptable products and services. As basic needs are met, there is an additional challenge to innovation – determining customers' hidden needs.

### **Intensified Competition**

The third driver shown in Figure 1.1 is the evolving nature and sources of competition. Logistics costs have plummeted and, consequently, 'safe, home markets' are being threatened by foreign competition. Companies may also face competition from sources normally outside their industries. An example of this is the bicycle industry in Japan where a new entrant, Nippon Bicycle, has taken a significant share of the market by offering made-to-order, highly customized mountain bikes with a fast delivery time. Interestingly, Nippon is owned by the consumer electronics company Panasonic, which has made use of its expertise in logistics to become successful in a new market.

### **Changing Business Environments**

Finally, business environments are changing. Worldwide, markets are becoming more open as the market economy is embraced by most governments and through the efforts to reduce tariffs by trade groupings such as the European Union and North American Free Trade Association. Additionally, the regulations affecting specific markets are being relaxed in many Western countries (for example, the deregulation of transport, post and telecommunications). An example of changing regulations that could drastically change one market is the US Food and Drug Administration's (FDA) planned faster approval of generic drugs.

In the last decade, an additional factor in the business environment has emerged which also influences the need for innovation. Management has largely focused on cost-cutting through a reduction of the resources required for key business processes. Many companies have redesigned their business processes and significant efficiency gains have been achieved. A continued focus on efficiency gains will only bring diminishing returns and cost-reduction myopia needs to be replaced by a focus on increasing revenues and profits. For many companies the most promising approach is to develop more new products and services.

A clear symptom of the amount of market change is the short product life-cycles and high levels of new product failures reported in many markets. Therefore, companies in both service and manufacturing are becoming more dependent on constant innovation. A recent survey of manufacturing managers showed that the ability to introduce new products was perceived as one of the key challenges facing European companies.<sup>7</sup> Survey evidence from the service sector in Europe also shows that innovation is becoming more important and is perceived by managers as the most important way to improve the quality of services to customers.<sup>8</sup>

### **Responding to the Need**

Although the need for innovation is clear to see, responding to this need is challenging. The *Financial Times* suggested that 'there is no doubt that properly

managed innovation can bring industry the solutions which it needs and help it to achieve a competitive edge'.<sup>9</sup> However, is 'properly managed innovation' easy to achieve and how are companies attempting to manage innovation?

To be innovative, companies can choose to invest in research and development (R&D). Different industries make very different levels of investment. Increasing R&D spending can lead to more innovation but it should be recognized that such investments are inputs to the innovation process. They do not guarantee outputs or commercial success, as innovation performance is also very dependent on the people in an organization. Therefore, many companies are taking other steps to stimulate innovation.

### **Companies' Innovation Management – Examples**

Companies are taking steps to improve their innovation performance and of the management initiatives, the 3M Company's highly publicized initiatives have become icons of innovation management. In order to start to understand the scope of innovation, it is useful to review some of these service and manufacturing companies' initiatives, starting with 3M:

- ▶ If your company's portfolio already has over 60,000 products, where do you start if you want to increase innovative levels rapidly? The 3M Company has launched a host of initiatives to drive innovation. The cornerstone of 3M's management of innovation has been a focus on a clear measure of innovation performance – the percentage of revenues generated by new products. For example in 1995 the company aimed (and succeeded) in generating 30 per cent of revenues from products less than four years old. In 1997 tougher goals were set including 10 per cent of revenues from products less than one year old. The use of tough, financially based measures is only one aspect of 3M's initiatives. Their approach to stimulating creativity is legendary – employees are allowed 10 per cent of their time to work on ideas and projects that they have themselves devised. Ideas developed during this 'free' time can be nominated for special funding.
- ▶ Service firms and organizations are becoming more focused on process innovation and are looking at how technology and new approaches can both speed and improve customer service. Companies such as American Express and Mastercard are looking at how new 'contactless' technology can avoid credit cards having to be swiped through a reader and thus speed up the process of payment. Hospitals are increasingly applying process management concepts, which were originally developed in the manufacturing sector, such as just-in-time management.
- ▶ Consultants Arthur D. Little recently organized a convention of research-intensive companies including Philips, Renault, Nestlé, ABB, Audi, 3M, Nokia, BASF & BMW. These manufacturers identified three common aims in their innovation management.<sup>10</sup> Firstly, they wanted to develop 'seamless innovation processes', which break down 'barriers' between departments such as R&D, manufacturing and marketing. Secondly, these firms

are pushing to make their R&D departments more commercially aware. Thirdly, each company is making more use of external sources of technology.

- ▶ Budget airlines such as Ryanair and Easyjet can be said to have rewritten the rules of the air travel business. Prices for air travel have been slashed through a focus on 'no-frills' service, flying to airports with lower or subsidized handling fees, and also improved business processes (for example maximizing aircraft utilization).
- ▶ Some companies are announcing that they are focusing more on increasing new product output. For example, Vorwerk, a household products company decided that it needed to renew its entire product portfolio within two years.<sup>11</sup> The automotive manufacturer DaimlerChrysler also has a strategy to develop more new products.<sup>12</sup>
- ▶ Some major financial service providers, such as HSBC and Bank of America, have chosen innovation as an area on which to focus. For example, HSBC management have strongly communicated to staff the importance of innovation, and workshops are used to create ideas for new or improved customer services. In addition, HSBC have developed fast processes for implementing innovative ideas.
- ▶ Johnson & Johnson, the healthcare products company, has recently chosen to make innovation one of their core values. To support a coherent view of innovation throughout the company, the company has identified three ways in which innovation supports the business: it forges a vision of the future; fuels business growth; and promotes continuous learning. Regular articles in the company magazine give examples of successful innovation within the company, with process innovation being given as much attention as new products.

The above examples demonstrate the multifaceted nature of innovation management. Innovation management includes ways to motivate employees, selecting clear performance measures and creating a positive business culture. It also includes an emphasis on R&D, new products, technology and process innovation. Overall, this shows the wide range of approaches to stimulating and managing innovation that we need to consider. The main theme of this chapter is to introduce *how* innovation can be managed. Before we can discuss *managing innovation*, we need to establish what is actually meant by *innovation* itself and the terminology that we will be using in this book.

## Characteristics of Innovation

Although the need for more innovation is widely recognized, there is no commonly accepted view of what innovation means in a business context. Many employees think of it primarily as radically new products delivered by R&D departments; this is a narrow view, as we will see.

The dictionary definition of *innovation* – introducing something new – is

clear, but this does not help managers or employees understand the nature of innovation sufficiently. It focuses on newness and can lead us to overlook the fact that innovation can be based on modifying existing ideas. The dictionary definition also fails to give insights into the following questions. What are the most important types of innovation? How can innovation lead to sustainable competitive advantage? What is the most effective way to improve the innovation performance of a company? This book suggests answers to these questions and this section looks in detail at:

- ▶ Definitions of innovation.
- ▶ The different *dimensions* of innovation.
- ▶ The different *degrees* of innovation.
- ▶ The *phases* of an innovation.
- ▶ The functional areas involved.

### Definitions of Innovation

Various definitions of innovation have been developed and these will be reviewed, in order to develop our terminology. Managers have different views on the nature of innovation.<sup>13</sup> Therefore, establishing a clear understanding of the characteristics of innovation is not only essential for this book but also in organizations, where diffuse views on innovation arising from different functional perspectives, may hinder the implementation of innovation strategy.

The Austrian economist Joseph Schumpeter has strongly influenced the understanding of innovation and this will be discussed in Chapter 2. Schumpeter considered five different aspects of innovation and, although developed over 70 years ago, his definition is comprehensive:<sup>14</sup>

- 1 The introduction of a good (product), which is new to consumers, or one of higher quality than was available in the past;
- 2 Methods of production, which are new to a particular branch of industry. These are not necessarily based on new scientific discoveries and may have, for example, already been used in other industrial sectors;
- 3 The opening of new markets;
- 4 The use of new sources of supply;
- 5 New forms of competition, that leads to the restructuring of an industry.

Michael Porter defined innovation:

to include both improvements in technology and better methods or ways of doing things. It can be manifested in product changes, process changes, new approaches to marketing, new forms of distribution, and new concepts of scope . . . [innovation] results as much from organizational learning as from formal R&D.<sup>15</sup>

This definition covers very similar points to Schumpeter's but indicates that innovation can stem from an organization's learning and not just the R&D department.



Both Porter and Schumpeter use the word 'new' in their definitions. It should not be forgotten that many commercial innovations are not totally original and Everett Rogers, an expert on how innovations spread through markets, reminds us that innovation '... is an idea, practice, or object that is perceived as new by the individual or other unit of adoption'. The perception of newness is important rather than the originality.

Innovation is a term that can lead to confusion in the service sector.<sup>16</sup> A useful definition for the service sector is,

innovations in the service sector comprises [*sic*] new services and new ways of producing or delivering services as well as significant changes in services or their production or delivery. An innovation has been implemented if it has been introduced to the market (product innovation) or used in producing services (process innovation).<sup>17</sup>

The definition from the Organization for Economic Cooperation and Development (OECD)<sup>18</sup> is:

innovation consists of all those scientific, technical, commercial and financial steps necessary for the successful development and marketing of new or improved manufactured products, the commercial use of new or improved processes or equipment or the introduction of a new approach to a social service. R&D is only one of these steps.

Similar to Porter's definition, this points out that R&D is not the only element to innovation. In addition, the OECD definition adds understanding of the different steps involved and points out that innovations can be important in sectors other than the private economy.

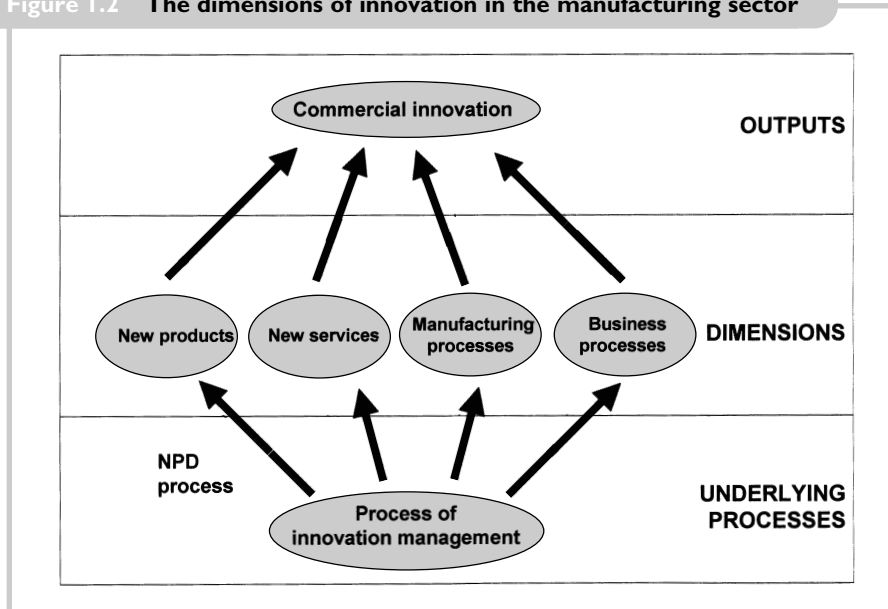
Psychologists view innovation as a social process, 'the intentional introduction and application within a role, group, or organization of ideas, processes, products or procedures, new to the relevant unit of adoption, designed to significantly benefit the individual, the group, organization or wider society'.<sup>19</sup> This indicates that the emergence of innovative ideas depends on the culture of an organization.

Comparing the various definitions of innovation given above, it can be seen that they have many common attributes covering: *what* is changed (such as product or process changes); *how much* is changed (whether it is completely new or only perceived as such); the *source* of the change (sometimes technology); the *influence* of the change (for its example social or commercial value).

### **Dimensions of Innovation**

Based on the broad understanding collated from the definitions of innovation, Figure 1.2 shows what we will refer to as the *dimensions of innovation*. These can be applied to the service sector but we will first discuss how they apply to manufacturing. *Product innovation* is important and can be thought of as the first dimension of innovation. However, opportunities for sustainable competitive advantage can be missed if an organization focuses solely on product innovation

Figure 1.2 The dimensions of innovation in the manufacturing sector



(see box case: Gillette). Companies in the manufacturing sector can also create services to help differentiate their products – *service innovation* is the second dimension. Improvements can also be made to the manufacturing and delivery process (normally referred to as *process innovation*). Finally, companies can use *business process innovation*; optimizing processes to make it easier for customers to do business with the company (for example order fulfilment), or to cut costs. The term business process innovation covers a wide range of possibilities and we need to differentiate it from process innovation. Process innovation refers to enhancements in the actual manufacturing process (or service delivery process in the service sector). Business process innovation can be improvements to any business process other than the actual manufacturing: ranging from supply chain improvements, to faster transactions with customers. Improving business processes often requires innovative approaches to the formal organization of companies.

#### Box case 1.2 Gillette – first-to-market risks

Some managers perceive innovation as being intimately linked to a first-to-market strategy. Breakthrough products such as the Sony Walkman have captured the imagination of many people so that they see innovation as only consisting of radically new products. Unfortunately, this view can lead managers to forget the biggest downside of being first-to-market – competitors may copy your innovation if you do not think of ways to protect it. What is worst, competitors may learn from the limitations of the first-to-market product and the ‘copy’ is likely to be better than the original.

The Gillette 'Mach 3' razor is a first-to-market product. Gillette developed this advanced razor, with its characteristic three blades set at different very precise angles, at a very high cost. A UK supermarket chain was quickly able to introduce a good copy of the product at a fraction of the development costs. This has meant that Gillette is more dependent on expensive television advertising to try and protect sales of their product. When products are easy to copy, competitors can even 'leapfrog' the original features and the Wilkinson Sword Company has now introduced a four-blade razor.

It is not only for academic clarity that it is important to consider how innovation should be defined. Promoting a clear understanding of the nature of innovation throughout a company is one of the key roles of top management because innovating in a number of dimensions can enable sustainable competitive advantage. Most products are relatively easy to copy and patents seldom give sufficient protection. For example, Cannon worked round several hundred patents owned by the Xerox Company in the development of their first and very successful photocopier. Leading companies have recognized the risk of their products being copied, and actively to combat this are focusing on other dimensions of innovation, such as manufacturing processes, to gain a sustainable competitive advantage<sup>20</sup> (see box case: Tetley's Teabags and contrast this to the earlier one on Gillette). Taking what we will call a *multi-dimensional* view of innovation leads companies to look for ways to complement product innovation through service, process and business process innovation.

**Box case 1.3 Tetley's Teabags – sustainable competitive advantage<sup>21</sup>**

Tetley is a market leader in the world teabag market and the company was the originator of the round teabag. On the face of it, the round teabag is only an incremental innovation over the traditional square version. However, through the process innovation required to support the production of the new product, Tetley found a way of gaining a sustainable competitive advantage. When the company developed the round teabag, it knew that with suitable marketing this new product could capture significant market share. Advertising copy was based around the better cup of tea that would result from bags where the tea could circulate better. However, Tetley also knew that competitors would quickly try to copy this product innovation. Therefore, the company decided not to talk to its normal supplier of manufacturing equipment about the new requirements. Instead, it hired Cambridge Consultants Ltd to develop a new manufacturing line for round teabags. When the new product was introduced the competition was unable to obtain similar manufacturing equipment quickly and Tetley maintained its lead. Even ten years later, the company is still enjoying a strong market position.

Management are the guardians of the underlying process that stimulates innovation within a company – the *process of innovation management* shown in Figure 1.2. Some parts of this overall process will be formally defined and documented,

such as the new product development (NPD) process. Others will be less tangible, such as the management of company culture to ensure bright new ideas are constantly being generated. Therefore, managers need to look for ways to improve the fundamental way by which innovation occurs in their organizations.

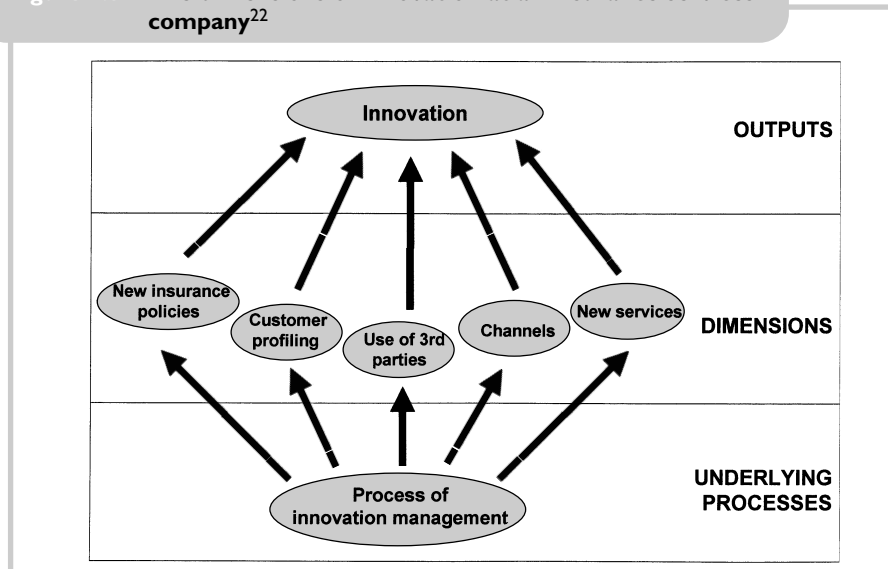
Consider the following analogy: in a modern manufacturing company, the line operators are not simply responsible for manufacturing products. They are also given full responsibility for constantly improving the manufacturing processes (through continuous improvement and other means). Some companies even talk about their operators being 'process owners'. Therefore, senior managers need to see themselves as the process owners for innovation management and not simply as managing the outputs of new products and services. With this different perspective, managers view the processes in their organizations as one of their biggest assets.

### **Dimensions of Innovation in Services**

Service-sector managers also perceive the need for innovation to be high though the dimensions of innovation differ in services. An insurance and financial services company was concerned that its output of new products was low and decided to examine its overall innovation performance. A group of senior and product managers took part in a workshop to identify all of the dimensions of innovation relevant to their markets. To stimulate the team to come-up with ideas, the discussion was based on the parallels to innovation in manufacturing companies (Figure 1.2).

The workshop results are summarized on Figure 1.3. New products – in this

**Figure 1.3 The dimensions of innovation at an insurance services company<sup>22</sup>**



case new insurance policies – are important for competitive advantage. However, a range of other dimensions was identified. This included customer profiling to identify and contact customers with a unique value proposition; closer contact with third parties to help them contribute more to innovation (as most of the insurance policies were underwritten by suppliers); use of different sales channels (including banks, the Internet and brokers); and the creation of innovative new services – typically better ways for customers’ enquiries to be handled – in order to increase customer loyalty.

Through the review of the role of innovation in their markets, this company recognized that they had more possibilities to innovate than they had previously thought. Now, as each new product is developed, the company looks for ways to innovate in all of the dimensions shown in Figure 1.3, with the goal of making their new insurance products ‘hard to copy’. It is becoming crucial for service companies to examine the different dimensions of innovation and how these can complement one another.

#### **Box case 1.4 Les Concierges – serving Indian professionals<sup>23</sup>**

The ‘cash-rich, time-poor’ market segment consists of professional people who are top earners, but because of their demanding jobs and family commitments have very little spare time. Providing services for this segment in India has allowed founder and CEO of Les Concierges, Dipali Sikand, to build a business of over \$1M with over 350 staff. The company was started in the Bangalore area, which is the centre of India’s software industry, but is now active in half a dozen Indian cities.

The idea behind Les Concierges is simple and extends the concept of the ‘travel desk’ operated by travel companies for large employers. Sikand’s business targets large employers (rather than individuals) and offers to make their employees’ life easier by taking on some of their personal tasks and family organization. This means that a company can help its employees focus more on their work and Les Concierges has posted one or two of its staff to 70 companies, mainly in the information technology industry. The host company provides a desk and an intranet connection for Les Concierges and then the ‘help desk’ can go live, offering four categories of service: shopping, everyday tasks, entertainment and travel. The host company pays a retainer each year based on its number of employees (but it sees the return through increased employee productivity) and a transaction fee is normally paid by the employee (who saves precious time in a busy schedule).

The interaction with customers is highly important and Sikand refers to this as ‘high touch’. She has hired almost exclusively women, as she feels that they are more sympathetic to customers’ needs. With such empathy, Les Concierges can often delight its end-customers by coming up with original ideas for birthday presents and the like. The importance of the behind the scenes organization is also recognized and Sikand has concentrated on making this high-tech – including proprietary software to track each customer

transaction and coordinate the many tasks passed daily to outside suppliers. The idea behind Les Concierges may be simple, but recognizing the need and developing a 'high-touch, high-tech' solution are Sikand's real innovations.

The above discussions on both the service and manufacturing sector demonstrated the multi-dimensional nature of innovation. In 2002, the R&D manager from an industrial safety equipment company told the authors 'if I ask five different people at our company what innovation is, I will get at least five different answers'. This illustrates the need for a common understanding of the goals of innovation and this manager has focused strongly on communications as part of his innovation strategy. AXA Insurance made a similar experience and their 'definition' of innovation will be discussed in the main case study at the end of Chapter 3 on managing innovation in services.

### Degrees of Innovation

Innovation can be dramatic. Breakthroughs such as penicillin, the Walkman personal stereo, and the ubiquitous Post-It are often examples that people name when they talk about innovation. However, it is important to recognize that there are different *degrees of innovation*. There can be breakthroughs, which are normally referred to as *radical* innovations. They may be based on new technology and can create new markets or completely change existing ones. In addition, though, there are *incremental* innovations, small changes to existing products, services or processes that can also be important.

Although radical innovations such as breakthrough products often capture the imagination of the public, a lower degree of innovation is more common. Research at INSEAD business school in France investigating over 100 companies showed that 84 per cent of product innovations were 'line extensions' (that is incremental innovation) and that on average 62 per cent of revenues came from such products.<sup>24</sup> As might be expected, though, 38 per cent of revenues (and 61 per cent of profits) came from the radical product innovations.

The degrees of innovation – from no change, to incremental, to radical – is an important concept. Consultants Booz-Allen and Hamilton proposed that there are six degrees of product innovation (Table 1.1). The first degree is the improvement of existing products to provide improved performance or greater perceived value to customers. Developing new products that provide similar performance at lower cost is the second degree, followed by existing products that are targeted to new markets. New products that supplement a company's established product lines is the fourth degree. Another form of product innovation is the creation of new product lines. The last degree is defined as 'new-to-the-world' products that create entirely new markets. Table 1.1 shows that three categories are related to 'old product development' and three to 'new product development'. The degree of innovation is a somewhat controversial subject, as some observers will view certain innovations as radical, whereas others may perceive them to be incremental. This discourse often heard in academia. However, the search for an

**Table 1.1** Degrees of product innovation<sup>25</sup>

	Degree of product innovation	Old–New product development
1.	Improvement and revisions of existing products	Old
2.	New products that provide similar performance at lower cost	Old
3.	Existing products that are targeted to new markets	Old
4.	Addition of products to an existing product line	New
5.	Creation of new product lines	New
6.	New-to-the-world products	New

unambiguous definition of, for example, radical innovation is probably not a very productive one – since the degree of innovation is context-dependent.

### Evaluating Dimensions and Degrees

The concepts of the dimensions and degrees of innovation can be used to analyse the competitiveness of individual innovation projects and also a company's portfolio of innovation projects. We refer to this as a *dimensions and degrees analysis*. Consider the example of an innovation project to develop an incremental product. This product might not be very competitive, as it is based on previous products. Table 1.2 shows a typology and the tick in the column 'product' indicates that it is an incremental product innovation ('improvements'). Although the degree of product innovation is low, the new product could be supported by related services, which can be provided at lower cost (see tick under column 'service'). In the manufacturing process, radical innovation is

**Table 1.2** Example of a dimensions and degrees analysis

	Degrees of innovation	Dimensions of innovation			
		Product	Service	Process	Business process
1.	No innovation				✓
2.	Improvements	✓			
3.	Similar performance at lower cost		✓		
4.	Targeting to new markets				
5.	Addition to an existing product line				
6.	Creation of new product line(s)				
7.	New-to-the-world			✓	

planned in the way the product will be produced, as this will lead to a sustainable advantage in terms of lower costs. The utility of Table 1.2, in analysing individual projects, is that it forces organizations to think how they can innovate in the various dimensions to become and remain competitive. For example, the Mars Group, manufacturers of confectionary and other products, always consider where their prowess in manufacturing can be utilized for each new product.

Table 1.2 can also be used as the basis for reviewing the range of innovation projects that a company is in the process of implementing. Each individual project can be analyzed and then the overall balance in the portfolio, for instance the mix between incremental and radical products, can be determined and compared to the goals of the innovation strategy.

Continuous improvements can improve manufacturing processes or service operations, leading to higher-quality output at lower cost. Incremental improvements add up over time to significant increases in performance. Many manufacturers have and continue to reap rewards from continuous improvement – *kaizen* in Japanese. The challenge is for management to communicate to employees the potential contribution of continuous improvement to innovation.

The service sector has been relatively slow to adopt continuous improvement and other techniques to improve processes. This is partly because an intimate part of the service delivery process is the interaction between a company's employees and the client or customer. Although the service delivery process is dependent on people, this does not prevent constant improvements being possible. On the contrary, continuous improvement is essential in the service sector because even small improvements to operations are quickly recognized by customers and can increase satisfaction levels significantly.

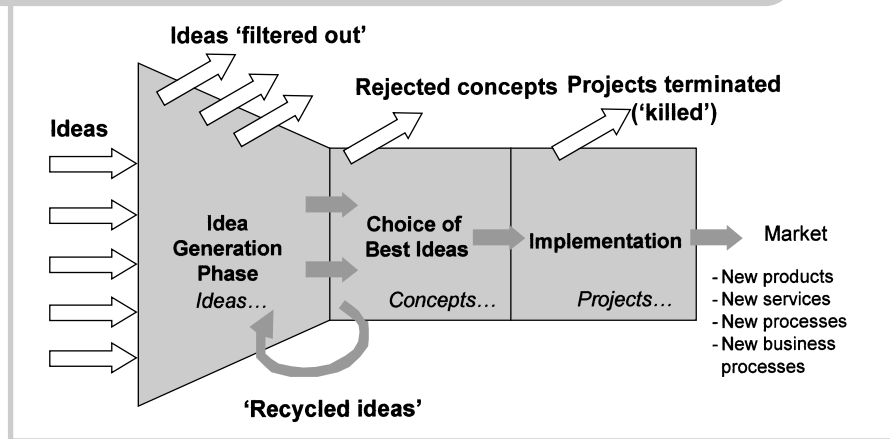
### **Phases of Innovation**

Any innovation must progress through a number of *phases* before it is commercially viable. This is true, irrespective of the type of innovation – whether it is a new product, a new service, a new process, an improved business process, or any combination of these. All innovations begin with the generation of ideas and the road to implementation and commercial success can be a long one. Additionally, many ideas fall by the wayside. For example, in the pharmaceutical industry, ideas for new drugs are based on novel chemical structures called 'new chemical entities' (NCEs). These take years to develop, test and to introduce to the market. The majority of NCEs are rejected along the way for one reason or another (for example undesirable side effects) and typically only one NCE in a thousand will be commercially successful. Within any organization, ideas in every dimension of innovation need to be generated because as researchers have recognized, 'too much of the focus of new product development is on product features. Successful NPD should focus on not only product features but on the entire product/service/financial offering . . .'.<sup>26</sup>

Irrespective of the dimensions and degrees of innovation involved, ideas are generated, some are selected and developed into *concepts*, and the best of these concepts are chosen for implementation. Figure 1.4 shows the typical phases of



Figure 1.4 The typical phases of an innovation ('the development funnel')<sup>27</sup>



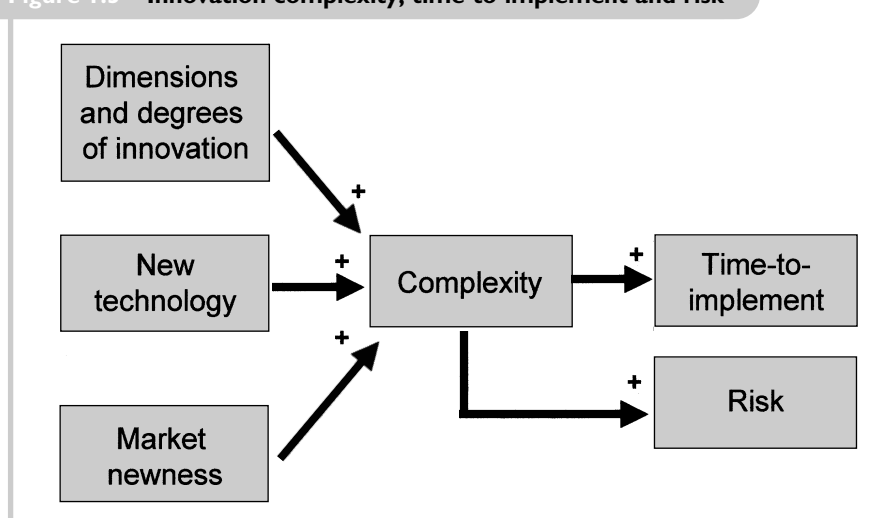
innovation, with a funnel of ideas being generated and collected by an organization. Some ideas are filtered out quickly whereas others progress further and are developed into what are normally called concepts. An initial idea might be developed into a concept by a small team of people from different functional areas of the business working together part-time over a few weeks or, for more complex ideas, the process of developing the concept may take longer. At the concept stage, an idea for a new product or new service will have been formalized to the extent that some questions such as the size of the potential market and the best way the product or service can be designed will have been considered (although these questions will not have been answered to a high level of detail). Similarly, at the concept stage, ideas for new processes will have been analysed as to the investments required and the returns these can bring. Normally, management takes the decision on which concepts will be chosen to become *projects* (the implementation phase), although the way in which an organization chooses the particular concepts for development may not be transparent to many of the employees. Certain concepts may be rejected as currently uninteresting, to emerge later as 'recycled ideas'.

Obviously, the innovations developed will have varying levels of success. The analogy to a funnel used in Figure 1.4 is not new; Simon Majaro of the Cranfield School of Management has used it for many years. Kim Clark and Steven Wheelwright from Harvard Business School have also used it as a basis for discussions with managers on the typical phases of innovation.<sup>28</sup> They asked managers to draw their own versions of the how their organizations manage ideas through to implementation. From this it was found that managers perceived that the different phases often overlap, problems are common and so iterations are necessary. Therefore, it must be recognized that Figure 1.4 is a simplification and the efficient and linear flow from idea, to concept, to implementation is desirable but not necessarily easy to achieve.

### Innovation Complexity

The time required for the implementation of an innovation depends on several factors, as shown by Figure 1.5. Firstly, the degree of innovation influences it. A radical innovation will normally take longer to develop than an incremental improvement. This is because it may involve techniques and technologies that are new to the company. In process innovation, incremental ideas are normally improvements to existing operations, whereas new equipment (for example, for a manufacturing line, or new information technology for a bank's operations) can often be viewed as a radical innovation. (The Fruit of the Loom company views new manufacturing equipment as a radical innovation because of the investment required, the risks involved, and the significant improvements in performance levels that are expected from the equipment. Wipro Technologies, the Indian R&D off-shoring company has helped its financial services clients achieve radical improvements in customer service levels through better IT.) Secondly, the number of dimensions of innovation involved can add complexity. For example, a new insurance policy which is dependent on new information technology and establishing a new set of distribution channels, will take longer to develop than an incremental product innovation, which uses existing systems and channels. Overall, the complexity and risk of an innovation project depends on the dimensions of innovation involved, the degree of innovation in each dimension, whether new technologies are required, and the market being targeted. In Figure 1.5, the '+' signs indicate that the factors increase complexity, which in turn normally increases both the implementation time and the risk. However, management can take steps to prevent complexity increasing both the risk and the time required for innovation projects.

Figure 1.5 Innovation complexity, time-to-implement and risk



### **Innovation throughout the Organization**

An essential point to note is that if an organization is to be fully effective, every part of that organization needs to actively contribute to innovation. Innovation is certainly not just the responsibility of an R&D department in a manufacturing company, or the strategic planning group in a service operation. The main functional areas that should be involved are:

- ▶ *Research and development*: for many managers, R&D is *the* source of innovation and it is true that this function should drive many of the ideas for new products and services in a company. However, companies that concentrate solely on R&D can fall into the trap of producing sophisticated products that the market does not require. This has been recognized by a leading economist who said ‘the proper management of innovation is much more than establishing and maintaining a research and development laboratory that produces a great deal of technical output’.<sup>29</sup>
- ▶ *Marketing*: has a key role to play in generating ideas for innovation, through creative forms of market research. Marketing can make the difference between a good idea and a successful product. Without marketing and sales, a product innovation, or a new service will not attract customers’ interest and developing an effective sales channel is fundamental.
- ▶ *Operations*: this function, which is often called *production* or simply *manufacturing* in the manufacturing sector, also should contribute to innovation. Unfortunately, many operations managers do not perceive that they have a key role in driving innovation. This limits the ability of a company to obtain longer-term competitive advantage, through process innovations that are often harder to copy than product innovations. Service sector companies often underestimate the potential value of operations’ contribution to innovation.
- ▶ *Finance and accounting*: is normally not perceived as being able to make a contribution to innovation. However, it can provide essential support in calculating return on investment for innovation projects.<sup>30</sup> At leading companies such as Agilent Technologies, the controlling function plays a leading key role in determining which projects offer the best combination of low risk, high return and a good match to the available resources. The finance function can make a considerable contribution to developing effective pricing packages. An example of this is the ‘power by the hour’ leasing offered by major aero-engine manufacturers.
- ▶ *Human resource management*: hiring, developing and motivating good people are essential and challenging aspects of innovation management. The creative atmosphere of small teams can easily be lost as organizations grow and so the human resource function can and should proactively support the maintenance of an innovative culture in their organization.
- ▶ *Outside resources*: are very necessary. For example, suppliers in the automotive industry conduct significant parts of the product development for car manufacturers. Similarly, universities and research institutes can enable

small organizations to economically partake in the development of new technologies, and develop new core competencies.

The task of general management is to stimulate the cross-functional teamwork that is needed for effective innovation. Researchers have identified the friction and lack of understanding that commonly arise between different functions, particularly marketing and R&D.<sup>31</sup> Ensuring the active involvement of the different functions is a task for management, and Akio Morita, the late Chairman of SONY, recognized this saying, ‘this is the job of top management – to arrange good communications [between functions]’.<sup>32</sup>

Our discussion on the characteristics of innovation shows its broad nature. Earlier we discussed the different ways companies are attempting to stimulate innovation. This shows that managing innovation involves many aspects. Next we will discuss the research findings in order to understand how innovation can be managed.

### Key Research on Innovation

Innovation is an area in which both economists and management researchers have been active. Throughout the chapters of this book, the pertinent research will be presented but here we will give an overview of the field, in order to understand how the different topics interrelate. This will help us develop a framework through which to view and plan the management of innovation. The three levels at which innovation has been researched are:

- ▶ The *macro level*: research on the sources and impact of innovation within economies and industries.
- ▶ The *micro or company level*: investigations of how companies manage innovation and the advantages that it brings them in terms of revenues and profits.
- ▶ The *project level*: which looks at the management of innovation projects, particularly NPD.

Before the theory is discussed it is important to introduce some concepts about management research.

### Research Methodology

Many popular articles on innovation management are based on anecdotal evidence – often pure opinions, or a single company example where improved performance was achieved. Although such evidence can be interesting, it leaves open the questions whether the improvements were the result of the actions taken (or of extraneous factors), and are the results applicable to another organization? Management research tries to address these points by taking scientific approach to gathering and analysing empirical data. Conclusions based on hard data should allow us to have confidence in our understanding how innovation

can be better managed, provided they are based on research that has high *validity*.

There are two related concepts here: the *internal* and *external validity* of research. Internal validity refers to how systematically, or rigorously, a study was conducted and, consequently, whether the finding can be believed. Consider, for example, a study of the influence of teamwork on product time-to-market. Did this research accurately determine how good the teamwork was and show whether there was, indeed, a clear link to the faster NPD? Many management articles assume links are clear – especially links between management actions and profitability – whereas systematic research is necessary to prove such links exist. Often it is nearly impossible to establish that direct – causal – links exist. Some studies have low internal validity and, if repeated by a different researcher, very different results would emerge. Therefore, in assessing the value of research it is important to consider internal validity; or in other words how reliable were the findings for the sample studied.

External validity refers to how broadly the findings of research conducted with specific organizations can be applied, for example, to organizations outside those which were included in the study. Has the study been conducted with organizations that are *representative* of the population to which we want to apply the results? This is a crucial point and the relevance of research based on a single company to other organizations is questionable. Only if findings are *generalizable* – they can be reasonably assumed to apply to other companies – are they interesting to managers looking for approaches to use themselves. It is surprising how many of the articles in the popular management press are based on cursory investigations that have questionable external validity because, for example, they looked at a very limited number of companies or companies in very specific business environments. As a result, innovation management is plagued with ‘quick fixes’ – approaches that have worked at one company and which their proponents claim are universal solutions. There are no panaceas for the management of innovation and the context in which an organization finds itself plays a key role. In assessing research, it is important to consider both the internal and external validity of the studies that are being described and we will consider the validity of research throughout this book.

### **Macro-Level Investigations**

For many years economists have researched innovation, and in the 1800s it was recognized that new products have an impact on the economy. Schumpeter, realized that process innovations in manufacturing also have a strong influence plus, when innovations emerge, they can threaten established industries. In their studies, economists have normally used measures of innovation such as R&D expenditures, the number of major innovations generated in an industry over time, and patent counts.<sup>33</sup> The studies made at the macro-economic level fall into two categories: research on the factors that influence innovative performance, and the spread and influence of innovation.

Typical of the studies on the factors that influence performance are those looking at the effect of the size of companies. Part of Schumpeter's work was the recognition that larger companies are at an advantage when it comes to innovation, because of the economies of scale they have in R&D.<sup>34</sup> Much of the subsequent research has focused on the size of companies and innovation. It has been shown, for example, that entrants are more likely to develop pioneering products and small firms are important innovators.<sup>35</sup> The effects of educational levels and national culture on product innovation have also been investigated (by looking at the correlations between qualification levels and patent counts), and the success rate of government policies that aim to support innovation.<sup>36</sup> The field of *development economics* is also relevant to the study of innovation. This has looked at the reasons why developing countries remain behind advanced countries. Factors such as infrastructure, human capital (in turn, determined by health and education), and the availability of credit to fund innovation all influence growth.

Studies on the impact of innovation are numerous and Everett Rogers has led much of this work. Innovations are adopted slowly at first but, as they become known and information is more widely communicated, the market quickly embraces them.<sup>37</sup> As an innovation is widely adopted, this stimulates growth through sales of new products and services. It may also change the basis of competition; change the structure of an industry. Innovations have been shown to be a driver of long-term business cycles, and to directly influence employment levels.<sup>38</sup> The work of economists on innovation is useful in demonstrating the interaction between the market environment and the firm. It indicates to firms the gravity of conducting a thorough analysis of their business environment and so Chapter 4 will focus on this topic.

Although the relationship between industry structure, company size and innovation has received considerable attention, economists have seldom investigated the actions of individual companies.<sup>39</sup> Management researchers from a number of disciplines including marketing, strategy, organizational behaviour and operations management have been active in this area and their findings provide many insights.

### **Micro-Level Investigations**

Managing innovation is a challenge because of the wide range of factors influencing its success or failure, including the allocation of resources, the skills of key staff, the generation of ideas and the organization of development teams.<sup>40</sup> Also, innovation is not necessarily a logical process and it is far from clear how companies can best improve their performance,<sup>41</sup> or what the key aspects of innovation management are.

One of the most common forms of research at a company level has been the quest to unearth the characteristics of innovative organizations. The companies chosen for these studies are normally large, have a reputation for being innovative and exhibit high market share and growth. For example, leading companies

develop over twice as many new products, develop them faster, use more technologies, and compete in more geographical markets.<sup>42</sup> The limitation of such studies has been demonstrated by a meta-study, which showed that over half the key factors identified were unique to specific studies.<sup>43</sup> This strongly demonstrates the need to carefully consider context when taking ideas or innovation best practices from one situation to another. In this book we will point to the contextual issues related to applying ideas and best practices.

It is important to ensure that innovation plays a central role within the business strategy.<sup>44</sup> It should be fully evaluated during strategic planning and clear processes are defined to manage the path from ideas to new products and services. Technology can be a prime component of innovation and therefore it should be given full management attention.<sup>45</sup> The work of Kim Clark of Harvard shows that general managers must investigate the value of technology to their companies.<sup>46</sup> In manufacturing firms, R&D needs not only to develop new products but it must also give a lead to other departments in becoming a continuously innovating company.<sup>47</sup>

Michael Tushman of Harvard has been a major contributor to the study of organizations and innovation. He and others determined that the formal organization and the underlying culture of a company have widely been identified as playing a key role in innovation.<sup>48</sup> This requires firms to be good at not only the internal coordination of the work of different functions but also at managing the linkages to other organizations. It has been shown that leading companies often change their formal organizations and so executives need to create organizational architectures that are both efficient and adaptive.<sup>49</sup> Company culture is recognized as being fundamental in supporting innovation, however, culture is a concept that can be difficult to manage.<sup>50</sup> Studies have concluded that the innovative companies display certain key cultural attributes. These include the propensity to experiment with ideas and the capability to motivate individual employees to be creative and to develop radical ideas. Successful projects are often discussed within such organizations and these 'stories' help focus the organization on the values of innovation.

Most of the literature on innovation concentrates on product innovation – new products – and either neglects or totally ignores other aspects. There are limitations to this because for manufacturers, 'the traditional emphasis on [product] innovation is no longer enough to succeed in an environment of increasingly intense competition'.<sup>51</sup> New services are also essential, and process innovation – developing efficient manufacturing – is often a key source of competitive advantage because it is difficult to copy.<sup>52</sup>

### **Project-Level Investigations**

The third level at which researchers have investigated innovation is the project level. Most of the projects studied have been new product development ones but we should bear in mind that the challenges faced are similar for new service products and also in the management of process innovation projects.

New products are a key source of competitive advantage and so studies at the project – new product development – level are common. Unfortunately, the success rate for new products is considered by many observers to be very low.<sup>53</sup> This is due to the many problems with product innovation, which can occur at every stage of development: from the creation of ideas, to NPD, to the introduction of products onto the market.<sup>54</sup> The literature has looked at these problems and the main findings can be grouped into articles on the benefits of faster NPD, the need for robust NPD processes, teams, techniques for accelerated development, and evaluation of product development.

### Faster New Product Development

The need for companies to develop new products faster is widely recognized.<sup>55</sup> The time required to develop and introduce a new product to the market is referred to as *time-to-market* or *cycle time*. It is becoming increasingly important for companies to reduce cycle time, and faster NPD has been a key focus in manufacturing for nearly twenty years.<sup>56</sup>

Fast cycle time is considered to have two main advantages. If a product is a totally new concept, then being first-to-market enables a company to define key market requirements before competitors enter the market. In established markets, being faster leads to increased profit and market share. Although the advantages of short cycle times appear clear in the popular business literature, they are not backed by unequivocal evidence and the link between fast cycle time and profitability is weak. To make NPD not only fast but also efficient, there are a number of requirements. These include the process, teamwork organization and leadership, specific techniques, and project evaluation.

### The NPD Process

Much has been written about the need for a clear new product development process, which defines the responsibilities of different functions, such as R&D and marketing, at different phases of NPD. Robert Cooper and Eltjo Kleinschmidt of McMasters University in Canada have published many definitive studies on the NPD processes. One investigation looked at companies' practices and led to a recommended *Stage-Gate*<sup>TM</sup> approach.<sup>57</sup> In this approach, management meets at the end of each stage of product development and has to approve the progression to the next stage. At each stage the various functions of a firm have clearly defined responsibilities, to ensure that an effective new product or new service product is developed. Many companies in both the service and manufacturing sectors have developed formal processes based on Cooper and Kleinschmidt's recommendations. Companies with formal processes were more satisfied with their performance.<sup>58</sup> However, having a process alone will not necessarily lead to faster NPD. Firms need to collect data on NPD projects, so that companies can learn from the past and improve by, for example, avoiding bottlenecks in the process.<sup>59</sup>



### Team Organization and Leadership

The skills and the motivation of people working on product development are crucial and such teams need to be well-organized and led.<sup>60</sup> Steven Wheelwright and Kim Clark have investigated many aspects of product development teams. One approach that has been widely applied to projects is to form NPD teams, drawing members from a number of functions. Including manufacturing and marketing and not just R&D ensures that all aspects of the business are considered in parallel at the design stage. For example, R&D and manufacturing will consider how to make the product easy to manufacture. Although they can be difficult to implement, it has generally been recognized that cross-functional teams have made NPD more efficient.<sup>61</sup> The people chosen to lead NPD teams need particular skills in motivating the team and managing communications both within the team and externally. Relatively recent research has shown that problems in managing new product teams are also prevalent in the service sector.<sup>62</sup>

### Techniques for NPD

After the importance of faster NPD was recognized at the end of the 1980s, there followed a wave of prescriptive articles on which techniques could be used to achieve it. Many of these were based on anecdotal rather than hard evidence.<sup>63</sup> One technique hailed as a major advance in reducing cycle time was *Quality Function Deployment* (QFD) – a Japanese method for ensuring that customer requirements are accurately captured – but this method is not a panacea.<sup>64</sup> (We will discuss the advantages and limitations of QFD in Chapter 7.) There are many techniques for improving NPD but the use of any of these will not, in itself, guarantee reduced cycle times. Bringing products to market faster is just not that simple – the situation and the way techniques are implemented play a key role.<sup>65</sup>

Overall, tools and techniques for new product development is a contentious area. Whilst many of the articles in the popular management literature have extolled the benefits of certain tools, the evidence on the utility of such tools is sparse. Managers need to deal with this by recognizing that there are no ‘quick fixes’ and the application of any tool or technique to speed NPD will take time and effort to make it effective within the particular situation faced by the organization in question.

### Evaluating NPD Projects

If NPD is to be improved, then the efficiency of the process and not simply the success of the product needs to be evaluated. Several studies have found that many companies do not evaluate their projects effectively and to evaluate NPD, suitable measures are necessary. Few companies capture accurately the time-to-market and this type of measurement is essential because, without it, valid

comparisons are impossible. Abbie Griffin of the University of Illinois has studied the topic of NPD measures extensively and recommends that metrics should cover the outcomes and characteristics of the project (inputs), and the process of NPD itself.<sup>66</sup> However, it has been recognized that ‘the performance of individual projects can be influenced by idiosyncratic factors . . . that may be difficult to duplicate from project to project’.<sup>67</sup>

### **Service Innovation Research**

Throughout this book we will be lamenting the fact that most of the research on innovation has focused on products and not services.<sup>68</sup> Although from a historical perspective this is understandable – most economies were manufacturing-driven when innovation research first started – today, the developed economies are mainly service-driven. Fortunately, researchers are now catching up and our knowledge of the impacts and management of service innovation is improving.

A major issue in the macro-level studies of the service sector is that the categories of innovation used in manufacturing studies (product, process and service innovation) are difficult to apply in services. Often innovations in the service sector do not neatly fit into these categories as, for example, a service product is often difficult to differentiate from the way it is delivered.<sup>69</sup> Measures of ‘innovation’ in services are also more difficult than in the manufacturing sector; for example the spending on innovation related activities is difficult to ascertain.<sup>70</sup>

Studies in the service sector have looked at the nature of innovation (and how it is different from the manufacturing sector). Such research has concluded that in addition to new service products, ways to improve the quality of the service, the process of its delivery, achieve lower costs, and make innovations harder to copy are all important aspects of service innovation (see box case on Singapore Airlines). Because of the intangible nature of service products, service innovation can be very challenging to manage and it is recommended that managers adopt formal process management to increase service innovation levels.<sup>71</sup> In Chapter 3 we will focus on the contrast between the service and manufacturing sectors.

#### **Box case 1.5 Singapore Airlines – sustainable competitive advantage<sup>72</sup>**

Singapore International Airlines (SIA) has often been voted the world’s best airline in surveys by travel magazines such as *Condé Nast Traveler* and the quality of its services is legendary. Its business strategy is based on a solid service product and attention to every detail of way it is delivered. A first-to-market innovation strategy has been an important part of SIA’s approach for years.

The SIA product itself – air travel – is reliable and the range of routes offered has been extended through alliances with other airlines. The way the service is delivered by SIA is designed to achieve maximum customer satisfaction and includes both people and technology-related ideas. Cabin staff are renowned for being friendly and helpful and this has been strongly promoted through the *Singapore Girl* advertising. Staff receive longer and more detailed

training than that offered by other airlines. For example, all cabin trainees spend time in homes for the aged in order to understand the problems faced by older travellers (a growing segment worldwide). Technology is also constantly updated and the aircraft fleet is one of the most modern in the industry. Having more modern aircraft has helped SIA differentiate their service product; passenger areas have larger than average seating, and a French fashion house designed the décor and all of the service ware (including the tableware). In-flight services have been constantly enhanced and the list of firsts here is long: first in-flight telephones; first in-flight fax machines; first Dolby surround sound and personal video screens in coach class. SIA has also led in the introduction of electronic tickets, but it is also flexible in allowing flight confirmations by telephone, fax or email.

It is interesting to note that competitors have quickly copied the technology-based innovations, whereas the quality of the service provided by staff has been harder for competitors to follow. In managing service innovation, a key question to ask is which dimensions of innovation can bring a sustainable competitive advantage?

## Managing Innovation – The Challenge

The theory illustrated the number of levels at which research has been conducted and it also demonstrated the complexity of managing innovation in firms. Many aspects of the nature of innovation need to be considered, as do different functional areas of a company. This leads us to the question of how can an integrated approach be achieved? How can the recommendations from the different fields of research be related to the situation facing an organization?

### Need for a Framework

The skills required to manage innovation effectively are different from general management principles in various respects. Innovation management often requires managers to match 'technical' expertise, in areas such as technology and project management, with 'soft' skills in people management, to promote creativity. The skills needed for technology management relate closely to engineering and the physical sciences, whereas the soft skills are closer to the social sciences. Few managers have been educated in both of these areas. Developing new products, services and processes is inherently uncertain and dealing with risk and uncertainty is central to innovation management. This also requires managers to be aware of techniques for dealing with risk. Another point is that innovation often requires significant investment and the interplay of financial and technical considerations are complex but essential, if good decisions are to be made. The management of innovation requires a distinct mix of skills and this is what makes it such a fascinating challenge.

In many ways innovation management is in its infancy. Although there are tools, theories and approaches, there is not yet a clear methodology to help managers improve innovation performance. A similar situation existed in the 1980s in the area of quality management, where even the meaning of ‘quality’ was being debated (for example should an ‘internal’ or ‘customer’ viewpoint be adopted?).<sup>73</sup> Quality management tools, such as Statistical Process Control (SPC) and cause and effect figures, were emerging, as were approaches to people management such as quality circles (groups of manufacturing employees meeting on a regular basis to discuss how their manufacturing could be made more efficient). Today, this collection of tools and techniques has been combined into the widely recommended methodology of ‘Six Sigma’ quality management.<sup>74</sup> The Motorola Company was largely responsible for creating this integrated approach. Currently, innovation management has not reached this level of maturity. Therefore, no integrated methodology is available and managers are faced with the challenge of having to merge ideas from different areas of research.

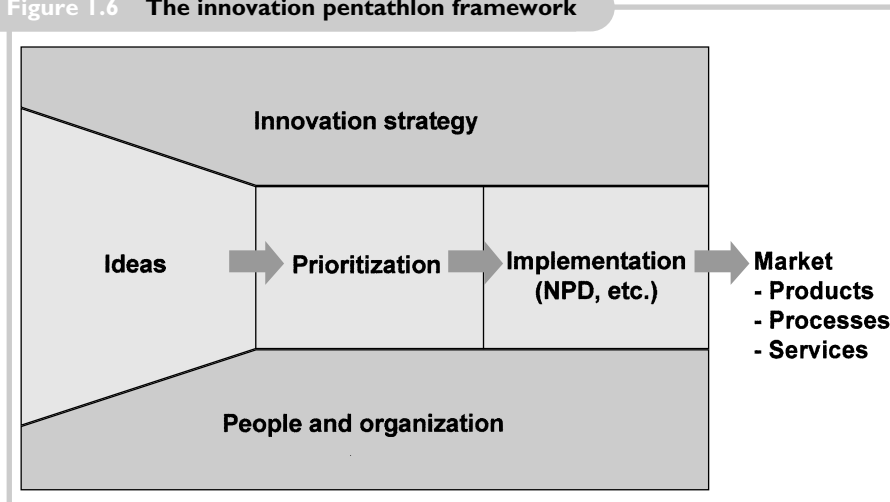
In research interviews with managers, it has emerged that they identify many facets to managing innovation: they cite strategy (for example, whether to be first-to-market, or to follow); people management (for example, motivating teams); and good project management (for example, in striving to meet challenging time-to-market goals).<sup>75</sup> Integrating the many facets of innovation management is a major challenge. For example, the director of one company in the manufacturing sector said he really needed a ‘systematic way to encourage and manage innovation’. Taking the main areas of the research literature at the company and project level, we have developed a framework to illustrate the main elements of innovation management and their relationships.

### **The Innovation Pentathlon Framework**

Figure 1.4 gave a simple representation of the way a business generates and implements innovation; the process of innovation within an organization or, as Wheelwright and Clark termed it the *development funnel*. The development funnel is a simplified representation of what may not be a strictly chronological flow, as iterations are common. The development funnel illustrates the process of ideas, through selection, to implementation but it does not show the link to a firm’s strategic intent (the importance of which emerges from the literature), or the link to a company’s culture. However, the development funnel does offer a very useful simple visual representation of a key business process – innovation.

To build on this work, two extra elements – *innovation strategy* and *people and organization* – need to be added because top managers perceived the importance of both linking the portfolio of projects to their overall strategy, and supporting the innovation levels of their organizations through effective people management. As its name suggests, the *Innovation Pentathlon* framework identifies five what we will term main *areas* or *elements* of innovation management, as shown in Figure 1.6. In each of the five areas, there are a number of key topics to be managed:

Figure 1.6 The innovation pentathlon framework



- ▶ *Innovation strategy.* Developing and achieving the goals of the innovation strategy is the responsibility of top management and this requires a focus on a number of issues. Assessing market trends and determining how these drive the need for innovation in the company's chosen sector(s) is the first step. The role of technology, the opportunities it can open, and how to acquire expertise in the relevant technologies needs to be considered. Management needs to communicate the role of innovation within a company – product, service, process and business process innovation – and match the resources to the strategy. For example, first-to-market approaches require particular capabilities in R&D and market development. Lastly, gauging innovation performance, through the use of appropriate measures is essential.
- ▶ *Ideas.* Ideas are the raw material for innovation and managers need to focus on creating an organizational environment that supports creativity at both the individual and team level, and the use of suitable creativity techniques. Creativity should harness the knowledge both within and outside the organization. A large enough volume of creative ideas needs to be generated, which addresses either existing or latent customer requirements for products and related services, or streamlining processes that serve customers. Good ideas blend technical, customer and market requirements. As innovation includes new products, services and new or improved processes, the scope for idea generation needs to be kept wide.
- ▶ *Prioritization.* An efficient process is required to ensure that the best ideas are chosen for development into new products, services and process innovations. This requires the use of suitable tools to analyse the risk and return of individual projects. Limited resources for the implementation of innovation projects need to be carefully assigned. Managers need to collate the information from across the range of projects, to check that the portfolio of

innovation projects is appropriately balanced and matched to the company's innovation strategy. Collecting information on portfolio decisions, so that in the future management teams can review and learn from their previous decisions.

- ▶ *Implementation.* This phase should focus on quickly and efficiently developing new products, services or processes, or a combination of these. Faster development times can be achieved through effective cross-functional teams, prototyping and testing. Commercialization is the last step in implementation and, for example, a successful market launch is essential for new products. The implementation process is an area where companies can learn from each project, so that the future performance can be greater.
- ▶ *People and organization.* Underlying innovation are many issues related to the management of human resources. These include hiring and training policies, job design, and creating effective organizational structures, which will increase innovation outputs. Creating a company culture in which employees are motivated to be constantly innovative is also fundamental. Effective reward and recognition programmes will need to be maintained.

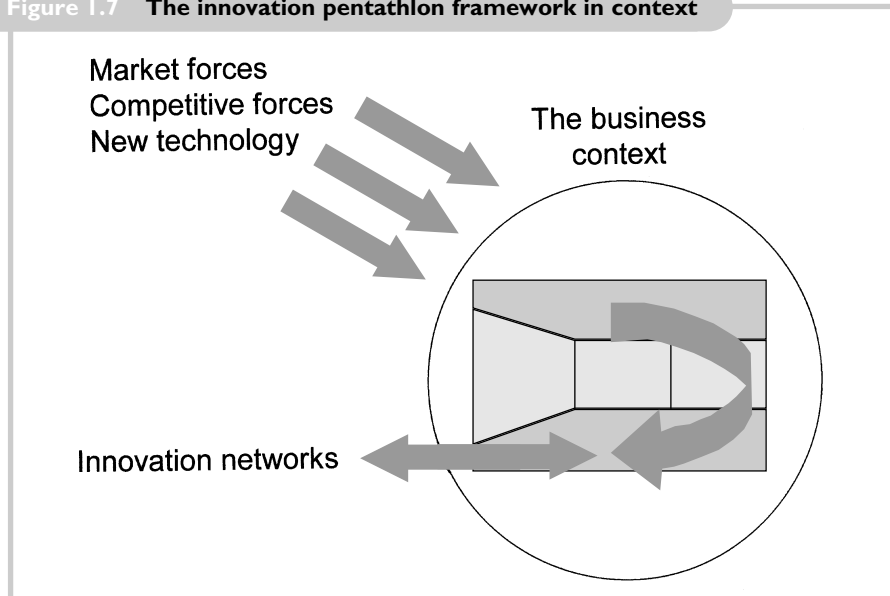
### The Pentathlon Analogy

Innovation management has been previously compared to a marathon race.<sup>76</sup> Innovation management needs constant and long-term attention from managers and, in this sense the analogy to a marathon is valid. However, the implication that innovation management consists of high performance in a single discipline is misleading. Innovation management is far more complex and requires good performance in all of the different disciplines. Consequently, a better analogy is a pentathlon, where good performance in five disciplines – the five areas – is essential.

There are two key points to note from Figure 1.6 and the above discussion of the five elements. Firstly, each of the elements is, in itself, a complex area and so it is not surprising that innovation management – which is made up of these inter-related factors – is hugely challenging. Secondly, top performance in one area alone will not lead to long-term competitiveness. Therefore, the focus of many companies over the last decade on NPD alone, to the detriment of the other areas, is misguided. Similarly, many companies make the mistake of confusing innovation with creativity and so start initiatives to increase the volume of creative business ideas, without considering how the best ideas can be selected and quickly implemented. Overall, the framework allows us to split a large topic into more understandable and manageable parts.

The Pentathlon essentially represents the innovation processes within one organization. The context – the business situation – strongly influences innovation management and this is shown in Figure 1.7, where the market and other forces directly impact how an organization should manage its innovation. The figure also indicates that an organization must look outside its boundaries to increase innovation levels. Innovation networks, such as links to suppliers and

Figure 1.7 The innovation pentathlon framework in context



technical institutes are increasingly important (the main case study at the end of this chapter on NTT-DoCoMo looks at partnerships and alliances).

### Applying the Framework

The Pentathlon Framework can be applied to identify the areas of innovation management in which an organization is both strong and weak. To demonstrate this two examples will be given, one from the service sector and one from manufacturing. Each of these has been disguised, to ensure confidentiality and Figures 1.8 and 1.9 indicate the areas of innovation management where the companies were relatively weak.

#### Example 1 International Bank – innovation processes

A business division of a major international bank spent time considering the lessons it could learn from innovation management in the manufacturing sector. Two conclusions were quickly reached: the bank's innovation strategy needed to be re-thought and new service product development needed a more formalized process.

Having observed that most manufacturing companies have Stage-Gate™ processes, the bank identified a weakness in NPD management. This was the result of no formal processes being applied at the bank, although an NPD process had been defined several years previously. The old processes were too bureaucratic, with many approvals required (for example, over ten managers

Figure 1.8 Innovation management at an international bank



needed to agree to new advertising copy). A new process was defined with the aim of implementing new service products faster, with appropriate but streamlined levels of approval.

Idea generation was also identified as a weak element in the bank's innovation management. Regular cross-functional workshops were introduced to generate initial ideas. The bank's management was impressed by the way that leading manufacturers used prototype products to get qualified feedback from customers. Consequently, the bank focused on turning ideas as quickly as possible into 'service prototypes' (with, for example, material on explaining the new service to customers and proposed advertising).

The improvements at the bank were also closely linked to the overall innovation strategy, which was then clearly communicated to all staff.

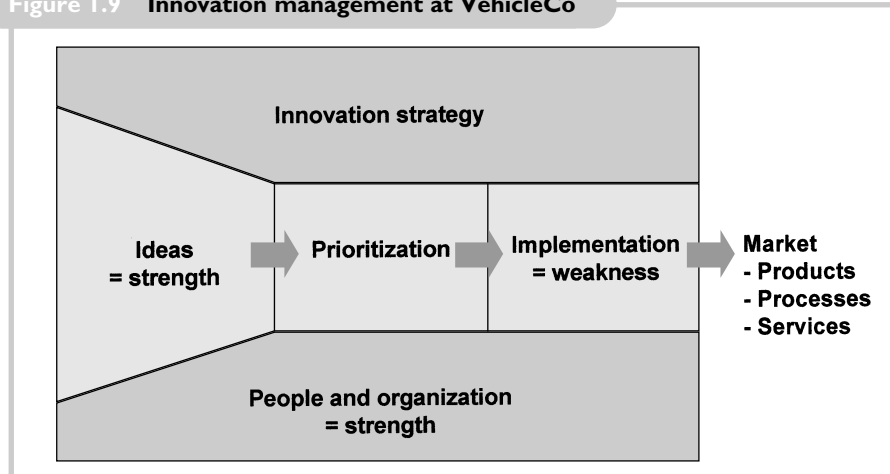
#### Example 2 VehicleCo – cross-functional creativity

Setting the right atmosphere for creativity is essential and the physical environment, the people and the business culture can all play a role. At a UK specialist vehicle manufacturer, which we will refer to as VehicleCo, the charismatic founder still takes an active role in generating technical ideas and ensuring that they are commercially feasible. By asking critical questions about new products – acting in some ways as a devil's advocate – he has created a culture that blends three distinct elements. A focus on developing first-to-market technical solutions is blended with a strong commercial awareness in R&D and an emphasis on constant 'prototyping', right from the concept stage. Prototypes are used as the basis for both internal discussions on new concepts and for discussions with customer groups.

The factory has an ideal physical environment for creativity; it is open plan with marketing and R&D sitting together, separated from production by a



Figure 1.9 Innovation management at VehicleCo



glass wall. Similarly, only a glass wall separates the workshop used for producing prototypes and so its work is clearly visible to all.

At VehicleCo it is normal for different departments to contribute to ideas. For example, although most companies use continuous improvement teams, these are normally only staffed by manufacturing employees. At VehicleCo, marketing and other functions are represented in kaizen projects, to bring a commercial focus and 'outside ideas' to brainstorming sessions. Similarly, production people are present in new product development discussions. Brainstorming has become synonymous within the company with mixing different functional perspectives. With such a strong cross-functional orientation, it is not surprising that the functional R&D organization has gone – replaced by business teams where R&D and marketing are combined in small groups with clear target markets. Over the last decade, the organization has been changed several times and is expected to change again. Employees see this as inevitable and not negative; it means the organization is flexible enough to react to market changes.

It would be wrong to leave the impression that VehicleCo have no issues with innovation management. For example, they only recently introduced a formal NPD process and so still have challenges to face.

### Limitations of the Framework

The Pentathlon Framework has limitations that we need to consider. Firstly, it is a categorization of the main elements of innovation management and not a predictive model of innovation performance. The framework provides a visual means of assessing the different aspects of innovation within an organization and can be used as a diagnostic tool for determining priorities for improvement.

However, the five different elements of the pentathlon are difficult to assess quantitatively and so care must be taken in concluding whether performance in one area is sufficient. Also, the interaction between the elements of the pentathlon, for example how changes in a company culture will influence the generation of ideas, are hard to predict and context specific. Within these limitations, the framework enables clearer discussions on the nature of innovation (just as the development funnel enabled managers to better understand how ideas are developed into products). It also can be used as a communication tool, to explain to employees where, why and how improvements in innovation management are to be made.

### The Structure of this Book

The structure of this book is based around the Pentathlon Framework with chapters as follows:

- ▶ *Chapter 2: Innovation and Economics* presents the macro-economic theory of the influence of innovation on markets.
- ▶ *Chapter 3: Contrasting Services with Manufacturing* discusses the innovation management issues in service industries, compared to those in manufacturing. It also introduces much of the terminology of innovation.
- ▶ *Chapter 4: Developing an Innovation Strategy* explains the first element of the Pentathlon framework. It covers the importance of companies setting an appropriate innovation strategy based on their market situation, and determining the resources required to achieve it.
- ▶ *Chapter 5: Ideas: Managing Creativity and Knowledge* discusses how to generate ideas for new products, new service products, and new processes. It covers approaches to improve both individual and organizational creativity.
- ▶ *Chapter 6: Prioritization: Selecting and Managing the Portfolio* discusses how the decisions can be reached on the best ideas which should be selected for commercialization.
- ▶ *Chapter 7: Implementation* explains how innovation projects can be managed to ensure that they are quickly and efficiently completed and commercialized.
- ▶ *Chapter 8: People, Organization and Innovation* discusses the role of people management in supporting increased innovation performance, including the influence of company culture.
- ▶ *Chapter 9: Boosting Innovation Performance.* This chapter on innovation change management first discusses how to audit innovation performance. It then indicates how improvements can be made to increase overall performance – as in a pentathlon, good performance in one area alone is not enough. Performance measures are also discussed at length.
- ▶ *Chapter 10: The Future of Innovation Management* concludes with directions for the future. As companies are becoming more effective at managing innovation, where will the leaders be looking for competitive advantage? This and other key trends are covered.

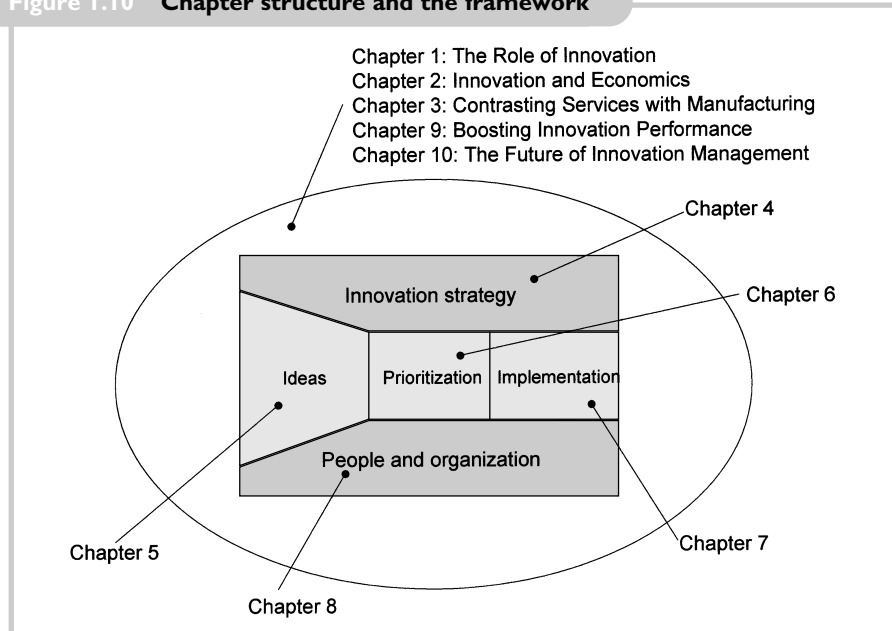
**Figure 1.10 Chapter structure and the framework**

Figure 1.10 illustrates the structure of this book, showing the five Chapters 4, 5, 6, 7 and 8 as being directly related to specific elements of the Pentathlon. The outer circle indicates that Chapters 1, 2, 3, 9 and 10 discuss topics that are related to the whole topic of innovation management.

### **Format of the Chapters**

Each chapter follows a similar style:

- ▶ The most relevant management tools and concepts, are presented covering both service and manufacturing. These have been selected from an extensive review of the literature, through our own experience in both managing innovation directly, and in teaching and consultancy.
- ▶ The relevant theory is discussed, in order to provide a solid theoretical understanding of the issues involved and insights into the latest research.
- ▶ The theory and tools are backed by examples, including four or five short 'box cases' (mini case studies) per chapter, selected to illustrate key aspects of how companies manage innovation in both the service and manufacturing sectors.
- ▶ At the end of each chapter a several-page case study is given with a set of questions for readers to consider. These main chapter case studies have been carefully selected to illustrate the challenges facing companies, how solutions have been developed, and the main learning points from each

chapter. Half the chapters have main cases based on manufacturing companies and the other half focus on the service sector.

- ▶ A summary recaps the main points and gives practical recommendations for the management of innovation.
- ▶ Two or three annotated recommendations for readings – either books or papers – are given for readers who want to go deeper into the topics covered in chapter.
- ▶ The references for the chapter are listed in the order in which they were cited at the end of the book.

For this introductory chapter, we start with a main case from the service sector, looking at the innovation management challenges facing a Japanese mobile telephony service provider, NTT-DoCoMo.

## Summary

The aim of this book is to present ways to improve innovation performance through the development and successful implementation of an innovation strategy. This chapter has showed that:

- ▶ The need for innovation is increasing and being driven by technology, customers, new forms of competition, and the business environment.
- ▶ There are four main dimensions of innovation – product, service, process and business process innovation. Companies need to identify which types of innovation are important for them and how successful they have been in the past.
- ▶ Innovation has different degrees. It consists of not only of breakthroughs (radical innovations) but also incremental improvements, which are equally important to companies in both the manufacturing and service sectors.
- ▶ Extensive research has shown that innovation management is complex and multi-faceted. Its scope is wide, ranging from business strategy, managing technology and new product development, to organization and people management. The Innovation Pentathlon Framework is a diagnostic framework for managing innovation.

## Management Recommendations

- ▶ Determine the intended role of innovation in your organization and clearly communicate this to employees.
- ▶ Consider how innovation can be enhanced from contributions throughout the organization.
- ▶ Use dimension & degree analysis to identify whether your products or service products can be made more competitive.
- ▶ Use the Pentathlon Framework to pinpoint the areas of innovation management that your organization needs to improve.

## Recommended Reading

- (1) Tidd, J., Bessant, J. and Pavitt, K., *Managing Innovation: Integrating Technological, Market and Organizational Change* (Chichester, UK: Wiley, 2nd edn 2001), ISBN 0-471-49615-4. An Excellent introduction to the issues in managing innovation. Chapter 2 shows how a clear understanding of innovation is needed within an organization.
- (2) Kim, W. C. and Mauborgne, R., 'Value Innovation: The Strategic Logic of High Growth', *Harvard Business Review*, vol. 75, no. 1 (January–February 1997), pp. 103–12. Presents how product innovation needs to be complemented by service and other forms of innovation.

## Main Case Study **NTT-DoCoMo, Japan – partnerships for innovation**<sup>77</sup>

Before reading this case, consider the following generic innovation management issues:

- ▶ How can partnerships and alliances help a company in the service sector achieve its innovation strategy?
- ▶ How can service and product strategies of different companies be aligned to target specific customers segments?
- ▶ How can a service provider make it harder for competitors to copy innovations?

Today, NTT DoCoMo is the top Japanese mobile telephone service provider with an enviable 60 per cent market share. The company was formed in 1992 when the Japanese government broke up the monopoly of Nippon Telephone and Telegraph (NTT). The name comes from both an abbreviation of 'Do Communications over the Mobile Network', and is a play on 'dokomo', the Japanese word for 'anywhere'. Although now the market leader, ten years ago the company was facing a serious situation. The Japanese economic situation was poor, handsets were heavy, subscriptions and call charges exorbitantly high, transmission quality was infamously bad and, to cap it all, DoCoMo was losing money.

### Technical Quality Up, Price Down

Some managers might have decided to try and manage the crisis through cost-cutting alone, but CEO Kouji Ohboshi made heavy investments to develop both the transmission quality and DoCoMo's total coverage in Japan. Parallel to this, a pricing strategy was adopted with the aim of making mobile telephone services affordable for everyone. DoCoMo slashed prices and, although competitors followed, DoCoMo raised the number of its subscribers significantly – to the point where it has 44 million today. This growth was at the expense of what the industry refers to as ARPUs (average revenues per user) and so, from an early stage, it was clear to management that a strategy based solely on increasing call quality, market penetration, and cutting prices was not sustainable.

**Main Case Study** *continued*

One of the unusual characteristics of the Japanese mobile telephone market is that there is no direct channel by which mobile telephone ('handset') manufacturers can market their products. Every handset in Japan is provided as part of a service contract. Additionally, Japanese law prevents DoCoMo from manufacturing equipment for retail sale.<sup>78</sup> Maybe this is what caused DoCoMo to take a broader view of innovation than many of the other service providers around the world and, in particular, to develop not only new services but also to take steps to strongly influence the design of manufacturers' handsets. Fortunately, through its history as part of NTT, external links to handset manufacturers such as NEC and Fujitsu were strong and this enabled DoCoMo to push for handsets with special features for specific market segments.

**Matching Services, Segments and Products**

With aging populations worldwide, many companies are trying to target what is often called the 'silver [haired] market' or 'silver segment' but DoCoMo has been particularly successful. Millions of new senior subscribers in recent years have adopted the Raku Raku ('easy-easy') range of mobile telephones, which have a set of features aimed at the particular needs of this segment. Today, 22 per cent of Japanese owners of mobile phones are over 50 years of age. The handsets were developed for DoCoMo by Fujitsu and have:

- ▶ Larger keyboards.
- ▶ Larger text on the display and simpler user interfaces than most cell phones. In addition, a synthesized voice explanation can be enabled, for each key pressed.
- ▶ Colours available include 'traditional silver' and 'eternal pink'. The handset comes with a set of standard ring-tone options to match users' tastes including the Japanese song 'Kawa no Nagare no Yoni', 'Raindrops keep falling on my head', and 'When the Saints go marching in'.
- ▶ The latest version of the Raku Raku includes a pedometer function that measures how far the person carrying the phone walks, and sends daily e-mails to subscribers telling them how far they walked and how many calories they burned. According to the press release, this 'is particularly relevant to users wishing to regularly update their doctors with this data'.

In marketing the Raku Raku, DoCoMo has trodden a careful path. The company 'highlights its technical features but in its advertising always cleverly links these to emotional benefits', says industry watcher Daniel Scuka of Wireless Watch Japan. 'For example, their adverts show grandparents operating the handsets easily and keeping in easy contact with their families . . . and, of course, "age" is never directly mentioned in their marketing'.

**Main Case Study** *continued*

It is not only for the silver segment that specific products have been deemed necessary. Japan has extensive mountains and many of its population enjoy outdoor activities, such as hill-walking and mountaineering. This is a segment that DoCoMo is also addressing with a corresponding handset, the 'Geofree II'. This has a set of features designed to appeal to those with an interest in outdoor activities:

- ▶ It is lightweight.
- ▶ It floats, is water resistant and shock-proof.
- ▶ It has a large (1.8 inch) liquid crystal display.
- ▶ It supports 'i-Area', a function that gives local information based on the unique base-station in which the handset is located.
- ▶ Matching its usage, the handset is marketed in colours such as 'active red' and 'dynamic blue'.

To understand its target segments, DoCoMo undertakes regular market research. Recent studies have looked at urban usage of mobile phones by 1,000 adults,<sup>79</sup> how adolescents use wireless services and the particular functions they most want in their handsets – 600 young people were interviewed.<sup>80</sup> John Lagerling, a manager in the DoCoMo strategy team, says that the company is careful to make sure that its approach to market research is broad. 'We regularly conduct research outside the mobile telephone market, as we are interested to see how "lifestyle" changes affect customers' needs. Take for example the Geofree. Users' ideas provided the inspiration for the handset, supplemented with by research looking at the developments in the digital watch industry, where rugged designs combined with "outdoor" features had been very successful. Combining a range of features in a handset offers outdoor sportspeople added safety – easy access to weather, local information and emergency services. You do not get these sort of insights for new products if you only research your own industry'.

Although the robust Geofree II, the handy Raku Raku, and handsets aimed at young people increase market penetration, this is not enough. 'Voice-based revenues' from these segments will not generate growth, as the Japanese market has matured and call rates remain an area of strong price competition. So non-voice services are also being developed.

#### **Non-Voice and the Portfolio of Services**

'Non-voice services have become a fundamental part of DoCoMo's strategy', says Scuka. Initially, these services were simple ones – such as downloadable, changeable ring-tones (these have become a success story worldwide for service providers, generating surprisingly high revenues). Once the downloadable ring-tone feature had been strongly marketed and the market educated, further downloadable services were added such as '30K Applications', relatively small Java games, paid for on a one-off download

**Main Case Study** *continued*

fee. DoCoMo introduced their most prominent non-voice service in February 1999. This is 'i-mode' (Internet mode), a service that is generating significant revenues.

The idea behind i-mode involved making Internet access mobile and easy and now it is the world's largest mobile Internet service with 38 million subscribers. Handsets with an 'i' button and special menus were developed to meet DoCoMo's requirements for fast and efficient Internet usage. Not only the handsets have been optimized but also the websites that are available have been coordinated – including those 'authorized by DoCoMo' – and a new business model created. Internet access is priced on the amount of information downloaded rather than the access time and this, combined with the low basic rate of 300 yen (\$2.4) a month for i-mode service, and one yen for a typical email, mean that it is good value for money.

Four categories of i-mode service are provided:

- ▶ 'Transaction' (e-commerce, banking and ticket booking through the websites of Amazon.com, Northwest Airlines and Citibank).
- ▶ 'Information' (for example CNN news, Bloomberg market updates).
- ▶ 'Entertainment' (for example Pokemon games, Hallmark e-greeting cards, and hit songs).
- ▶ 'Databases' (for example telephone directories, restaurant guides, etc.).

Each of these categories has a number of websites providing what the industry refers to as 'content'. DoCoMo has carefully selected content partners for the quality of their services, a willingness to optimise their websites for i-mode access, a willingness to accept site development risk, and an interest in forming a partnership (in which DoCoMo brings more traffic to the content provider in return for a commission on the information charges levied).

Fast and easy access has been achieved by reprogramming websites using a subset of the programming language HTML, which increases access speed. The version of HTML used also allows new websites to be quickly created and this focus on keeping it simple has allowed independent programmers to create a wealth of unofficial i-mode content. Although 'unofficial' sites do not generate content commission for DoCoMo, the availability of extra content has been well received by customers and does generate a great deal of data traffic revenue for the carrier.

#### **Stimulating and Coordinating Innovation**

Over 1,100 engineers are employed in DoCoMo's R&D and spending on development has increased by four times since 1998. This investment pays for a very wide range of projects, from improvements to handsets to better networks to support the uninterrupted availability of services. DoCoMo R&D has adopted a central coordinating role – including stimulating innovation – between the equipment manufacturers, content providers (websites) and

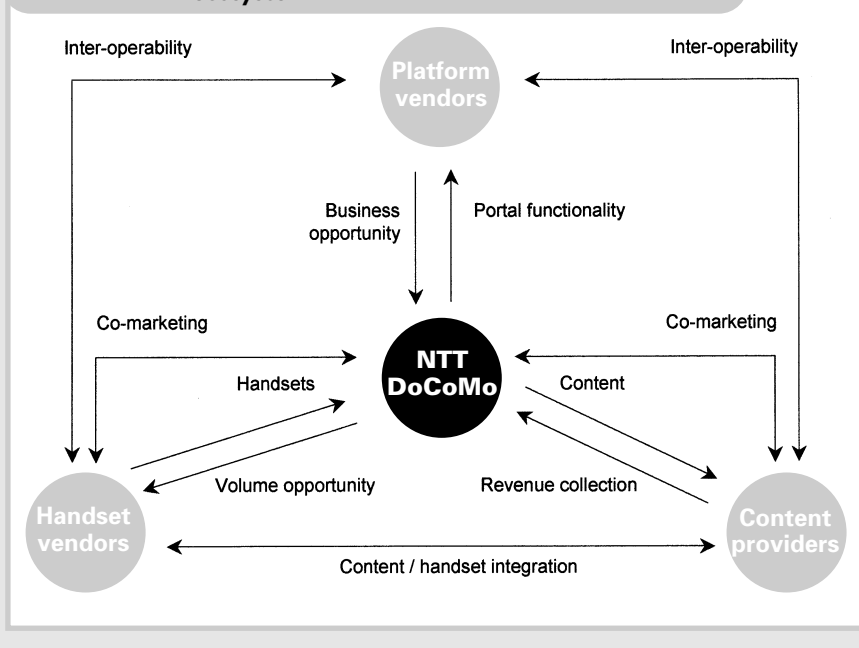


Main Case Study *continued*

platform vendors (network providers) as shown in Figure 1.11. In his role in the i-mode strategy department, Lagerling is responsible for managing some of these international collaborations. 'Our strategy is to view the value chain as an 'ecosystem', in which all of the partners need to have a fair margin. If we as a company are too greedy, the system will not function well and relationships will suffer. Therefore, we share both risk and gain'.

Handset vendors receive information from DoCoMo on specific product requirements and the potential sales volumes. This encourages close collaboration on handset NPD and often DoCoMo makes direct investments in such work, to ensure that new handsets are developed on time and these are 'integrated to the content' available. Close links with the content providers include joint work on website operability and co-marketing. The platform vendors are the third set of partners with which DoCoMo R&D has constant contact, as networks determine the availability and reliability of services. Availability is a key concern for Japanese users, as the country suffers from earth tremors and following these there is extreme usage of mobile telephones, as people check whether their relatives are OK. Therefore, network capacity needs to be planned to match these 'spikes' in usage. Overall, Lagerling says that 'subscribers judge the value of mobile Internet services on the basis of the quality of content'.

Figure 1.11 DoCoMo's i-mode collaboration concept – the 'ecosystem'<sup>81</sup>



**Main Case Study** *continued*

Mobile telephone service providers worldwide are looking for what they term 'killer applications' – services that mobile telephone users will use extensively and that will generate significant revenue growth for providers. DoCoMo is somewhat different in that it is not searching for one solution. Instead it is looking to be the coordinator that can constantly create the best mix of innovative services, handsets, content and reliable network platforms that provides customers with services that they will find essential to everyday life. 'We aim to provide our customers with the best possible range of services. That's only possible by developing our position within a sustainable network of innovative organizations', says Lagerling.