

# MANAGING INNOVATION

Integrating Technological,  
Market

and  
Organizational Change

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# Managing Innovation

## Integrating Technological, Market and Organizational Change

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# **Managing Innovation**

# PREFACE

Management research suggests that innovative firms—those which are able to use innovation to differentiate their products and services from competitors—are on average twice as profitable as other firms. However, the management of innovation is inherently difficult and risky: the majority of new technology fails to be translated into new products and services, and most new products and services are not commercial successes. In short, innovation can enhance competitiveness, but it requires different sets of management knowledge and skills from those of everyday business administration.

This book aims to equip readers with the knowledge to understand and the skills to manage innovation at the operational and strategic levels. Specifically, the book aims to integrate the management of market, technological and organizational change to improve the competitiveness of firms and effectiveness of other organizations.

Both recent management research and the experience of leading practitioners confirm that significant dimensions in the management of innovation are not yet satisfactorily addressed by management texts for three sets of reasons. Firstly, the management of technological innovation reaches beyond efforts to improve the efficiency of research and development, to include the effectiveness of technological development, that is the translation of technology into successful products and services. This suggests a competence-based approach to technology management, which requires analysis of organizational structures and processes.

Secondly, the management of organizational innovation has shifted from an emphasis on internal structure and culture, to external linkages and processes. The current fashion is for flatter organizational structures, organization around core business processes and the outsourcing of non-core

activities. However, it is clear from management research and experience that there is no 'one best way' to organize, but rather that different technological and market conditions demand different organizational structures and processes.

Finally, in the management of market innovation there has been a shift in emphasis from crude market segmentation and consumer behaviour, to relationship and networked marketing which demands more fine targeting of product development and closer linkages with suppliers and customers. Perceptions of the practice of Japanese manufacturers and the prescriptions of quality management have encouraged organizations to form close relations with lead suppliers and users in order to share information. However, the most appropriate form of relationship with suppliers and customers is likely to depend on the specific complexities and uncertainties of the technologies and markets.

All this suggests that it is no longer sufficient to focus on a single dimension of innovation: technological, market and organizational change interact. Better management of research and development may improve the efficiency or productivity of technological innovation, but is unlikely to contribute to product effectiveness, and therefore cannot guarantee commercial or financial success. Even the most expensive and sophisticated market research may be unable to identify the potential for radically new products and services. Flat organizational structures and streamlined business processes may improve efficiency of delivering today's products and services, but will not necessarily deliver innovative products and services, and may even become redundant due to technological or market change. An integrative approach to the management of innovation is required.

The management of innovation is inherently interdisciplinary and multi-functional, but most management texts tend to emphasize a single dimension, such as the management of research and development, production and operations management, marketing management, product development or organizational development. A few recent books have adopted a broader perspective, but typically these have been edited compilations of selected papers in the field. These are valuable reference sources, but do not provide a coherent framework in which to understand the various issues. Our approach aims to provide a coherent framework to integrate the management of technological, market and organizational change. We reject the 'one best way' school of management, and instead seek to identify the links between the structures and processes which support innovation, and the opportunity for, and constraints on, innovation in specific technological and market environments.

Our analysis and prescriptions are based on the systematic analysis of the latest management research, and our own research, consulting and teaching experiences at Imperial College Management School (ICMS), University of London, the Centre for Research in Innovation Management (CENTRIM) at the University of Brighton, and the Science Policy Research Unit (SPRU) at the University of Sussex, UK.

This book is written with the needs of postgraduate and other management students in mind, specifically those studying MBA electives or options on the management of innovation and technology, or MSc. courses dedicated to technology and operations management. It is also relevant to managers charged with the management of research and development, product development or organizational change. Where possible, we provide examples of good, and not so good practice, drawn from a range of sectors and countries. Examples of innovations from the service sector and smaller firms are somewhat under-represented, reflecting the little documented research in these areas. Nevertheless, as we shall argue, the process of innovation management is essentially generic, although organization-, technological- and market-specific factors will constrain choices and actions. This book is designed to encourage and support organization-specific experimentation and learning, and not to substitute for it.

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*Part I*

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**MANAGING FOR INNOVATION**



## KEY ISSUES IN INNOVATION MANAGEMENT

Building lawn mowers does not, at first sight, seem to offer much scope for innovation. Yet the Flymo company (now one of the largest European suppliers in this market) has built its position over 40 years through exactly that—innovation in design and in manufacturing of its main products. It holds over 70 patents, with a further 100 in the pipeline, and has used its commitment to systematic and continuous innovation to build to sales of over £100m. More important, it has made a conscious (and so far successful) decision to use innovation to preserve its position in an increasingly price-competitive market. Its commitment—shared by the 700 people who work for the company—to focusing on customer needs and meeting them with high quality and well-designed products has helped it fight off strong threats from low-cost competitors.<sup>1</sup>

The city of Sheffield in the north of England is traditionally famous as the home of cutlery. Yet by the 1970s import competition had become so intense that the Sheffield cutlery industry had almost disappeared. One firm managed to reverse this trend; the Richardsons organization increased its sales from £1m. in 1974 to £23m. in 1989, moving from being a small ‘commodity’ producer of knife blades to become a major player in the industry. Its success derives particularly from the ‘Laser’ product range, introduced in 1980, which combined a new type of blade with a lifetime sharpness guarantee. A recent advertisement suggested the latest version—the ‘Fusion Edge’ lasts 11,000 times longer than traditional knives. Their success was not a ‘one hit wonder’ but the product of a commitment to innovation in products and processes, concentrating on building core competence in the key technological fields of metallurgy and manufacturing processes.<sup>2,3</sup>

Innovation of this kind is not only associated with large firms. In 1995 the UK firm of Stanhay Webb won the Queen's Award for Technological Innovation for its work on the Singulaire multi-line seed planter for the agricultural industry. The firm had maintained progress during the recession and grown to a turnover of £4.5m., with around two-thirds going in exports. The concept originated in 1983 was to develop a seed drill which could do what no other drill in the world was capable of doing—planting raw seed accurately in one, two or three lines. Twelve years on the product is now a world beater, selling in 30 countries.<sup>4</sup>

It is also not confined to manufactured products; examples of turnaround through innovation can be found in services and in the public and private sector. For example, the Karolinska Hospital in Stockholm has managed to make radical improvements in the speed, quality and effectiveness of its care services—such as cutting waiting lists by 75% and cancellations by 80%—through innovation.<sup>5</sup> In banking the UK First Direct organization became the most competitive bank, attracting around 10,000 new customers each month by offering a telephone banking service backed up by sophisticated IT. A similar approach to the insurance business—Direct Line—has radically changed the basis of that market and led to widespread imitation by all the major players in the sector.

## 1.1 Innovation and competitive advantage

What these organizations have in common is that their undoubted success derives in large measure from innovation. Whilst competitive advantage can come from size, or possession of assets, etc. the pattern is increasingly coming to favour those organizations which can mobilize knowledge and technological skills and experience to create new products, processes and services.<sup>6</sup>

Innovation contributes in several ways. For example, research evidence suggests a strong correlation between market performance and new products.<sup>7</sup> New products help capture and retain market shares, and increase profitability in those markets. In the case of more mature and established products, competitive sales growth comes not simply from being able to offer low prices but also from a variety of non-price factors—design, customization and quality. For example, product differentiation based on superior quality or other factors is associated with higher than average profitability, but products which are differentiated on both quality and other features achieve twice the

normal return on investment.<sup>8</sup> In a world of shortening product life cycles—where for example, the life of a particular model of television set or computer is measured in months, and even complex products like motor cars now take less than three years to develop—being able to replace products frequently with better versions is increasingly important.<sup>9</sup> ‘Competing in time’ reflects a growing pressure on firms not just to introduce new products but to do so faster than competitors.<sup>10</sup>

At the same time new product development is an important capability because the environment is constantly changing. Shifts in the socio-economic field (in what people believe, expect, want and earn) create opportunities and constraints. Legislation may open up new pathways, or close down others—for example, increasing the requirements for environmentally friendly products. Competitors may introduce new products which represent a major threat to existing market positions. In all these ways firms need the capability to respond through product innovation.

Whilst new products are often seen as the cutting edge of innovation in the market-place, *process innovation* plays just as important a strategic role. Being able to make something no one else can, or to do so in ways which are better than anyone else, is a powerful source of advantage. For example, the Japanese dominance in several sectors—cars, motorcycles, shipbuilding, consumer electronics—owes a great deal to superior abilities in manufacturing—something which results from a consistent pattern of process innovation. The Toyota production system and its equivalent in Honda and Nissan led to performance advantages of around two to one over average car makers across a range of quality and productivity indicators.<sup>11,12</sup>

Similarly being able to offer better service—faster, cheaper, higher quality—has long been seen as a source of competitive edge. Citibank was the first bank to offer the ATM-type of service and developed a strong market position as a technology leader on the back of this process innovation. Benetton is one of the world’s most successful retailers, largely due to its sophisticated IT-led production network, which it innovated over a 10-year period.<sup>13</sup> South-West Airlines achieved an enviable position as the most effective airline in the USA despite being much smaller than its rivals; their success was due to process innovation in areas like reducing airport turnaround times.<sup>14</sup>

Table 1.1 indicates some of the ways in which enterprises can obtain strategic advantage through innovation.



**Table 1.1** Strategic advantages through innovation

<b>Type of innovation</b>	<b>Strategic advantage</b>
Novelty	Offering something which no one else can
Competence-shifting	Rewriting the rules of the competitive game
Complexity	Difficulty of learning about technology keeps entry barriers high
Robust design	Basic model product or process can be stretched over an extended life, reducing overall cost
Continuous incremental innovation	Continuous movement of the cost/performance frontier

## 1.2 Types of innovation

Before we go too much further it will be worth defining our terms. What do we mean by ‘innovation’? Essentially we are talking about *change*, and our focus in this book is particularly upon technological change. Change of this kind can take two forms—in the things (products/services) which an organization offers and change in the ways in which they are created and delivered. (Traditionally these are termed ‘product’ and ‘process’ innovation, although these terms can sometimes be confusing.)

For example, a new design of car, a new insurance package for accident-prone babies and a new home entertainment system would all be examples of product innovation. Change in the manufacturing methods and equipment used to produce the car or the home entertainment system, or in the office procedures and sequencing in the insurance case would be examples of process innovation.

Sometimes the dividing line is somewhat blurred—for example, a new jet-powered sea ferry is both a product and a process innovation. Services represent a particular case of this where the product and process aspects often merge—for example, is a new holiday package a product or process change?

A second dimension to change is the degree of novelty involved. Clearly updating the styling on our car is not the same as coming up with a completely new concept car which has an electric engine and is made of new composite materials as opposed to steel and glass. Similarly, increasing the speed and accuracy of a lathe is not the same thing as replacing it with a computer-controlled laser-forming process. There are degrees of novelty in these, running from minor, incremental improvements right through to