

4th Edition

MANAGING INNOVATION

Integrating Technological,
Market and Organizational Change



**Joe Tidd and
John Bessant**

Reviews for the fourth edition

'This is the best book on Innovation Management I have found so far. I have been using it for years teaching my engineering students at TU Delft. This book covers important insights from modern evolutionary research; it also provides useful practical knowledge for innovation management.'

*Alfred Kleinknecht, Professor of Economics of Innovation
at TU Delft, Netherlands and Visiting Professor,
Université de la Sorbonne, Paris, France.*

'I am convinced that it will become a landmark and a classic for Technology and Innovation Management. It is a comprehensive, carefully argued, self-contained presentation of the state-of-the-art of managing innovation. Students will benefit from the lucid exposition of key concepts and excellent teaching support, whilst scholars will find new insights suggestive of further research.'

*Peter Augsdorfer, Professor of Corporate Strategy
and Technology Management, University of Ingolstadt,
Germany and Grenoble Ecole de Management, France.*

'Tidd and Bessant have an awesome grasp of challenges innovators face in an increasingly knowledge-based and globally distributed world. Follow their search-select-implement-capture stages to understand how to meet these challenges.'

*Professor Mari Sako, Saïd Business School,
University of Oxford, U.K.*

Reviews for the third edition

'A limpid and very useful account of what we know about the management of innovation. Must read for executives, scholars and students.'

*Yves Doz, Timken Chaired Professor of Global Technology
and Innovation, INSEAD.*

Reviews for the second edition

'This is an extraordinary synthesis of the most important things that are understood about innovation, written by some of the world's foremost scholars in this field.'

*Clayton M. Christensen, Professor of Business Administration,
Harvard Business School.*

'The capacity to innovate is a key source of competitive advantage; but the management of innovation is risky. The authors provide a clear, systematic and integrated framework which will guide students and practising managers alike through a complex field. Updated to address key contemporary themes in knowledge management, networks and new technology, and with an exemplary combination of research and practitioner material, this is probably the most comprehensive guide to innovation management currently available.'

*Rob Goffee, Professor of Organizational Behaviour,
London Business School.*

'In a highly readable yet challenging text, Tidd, Bessant and Pavitt are true to their subtitle, since they do indeed achieve a rare analytical integration of technological, market and organizational change. Alive to the vital importance of context, they nonetheless reveal generic aspects to the process of innovation. Read this book and you will understand more, and with a little luck, an encounter with a rich example will resonate with experience, hopes and fears and provide a useful guide to action.'

*Sandra Dawson, KPMG Professor of Management Studies and Director,
Judge Institute of Management, University of Cambridge.*

'This is an excellent book. Not only is it practical and easy to read, it is also full of useful cases and examples, as well as a comprehensive reference to the current literature. I will be recommending it to my entrepreneurship students.'

*Professor Sue Birley, Director, The Entrepreneurship Centre,
Imperial College, University of London, UK.*

'The first edition of this book was essential reading for anyone trying to get to grips with innovation in theory and practice. This new edition, by embracing the challenges faced in the "new economy", is an ideal companion for the serious innovator. Starting from the view that anyone can develop competencies in innovation this comprehensive text provides managers with essential support as they develop their capability. The second edition contains many case illustrations illuminating both theory and practice in successful innovation and is a "must" for aspiring MBAs.'

*David Birchall, Professor and Director of the Centre for Business in the Digital Economy
(CBDE), Henley Management College, UK.*

'The authors of this book have managed to capture the essence of leading-edge thinking in the management of technological innovation and presented the multidimensional nature of the subject in an integrated manner that will be useful for the practitioner and essential reading for students and researchers in the field. This is the book we have been waiting for!'

*Professor Carl W. I. Pistorius, Dean, Management of Technology Programme,
University of Pretoria, South Africa.*

'Innovation has become widely recognized as a key to competitive success. Leaders of businesses of all sizes and from all industries now put sustained innovation among their top priorities and concerns - but, for many, innovation seems mysterious, unpredictable, apparently unmanageable. Yet it can be managed. This book provides a highly readable account of the best current thinking about building and sustaining innovation. It draws particular attention to important emerging issues, such as the use of networks of suppliers, customers and others outside the firm itself to stimulate innovation, and the role of knowledge and knowledge management to support and sustain it. As the authors say, there is no "one best way" to manage innovation: different situations call for different solutions. But if you want to drive innovation in your own organization, this book will help you to understand the issues that matter and the steps you can take.'

*Richard J. Granger, Vice President, Technology & Innovation Management Practice,
Arthur D. Little Inc.*

'Innovation has always been a challenge, but never more so nowadays in these turbulent times. This second edition of *Managing Innovation* helps address the practicalities of the challenge and places them firmly in today's new environment, where technology is changing faster and faster. Integrating the multiple aspects of innovation - and not just treating it as a technical issue - is a real benefit this book brings.'

C. John Brady, Director, McKinsey & Company Inc.

'The characteristics of doing business today - rapid change, extreme volatility and high uncertainty - mean that traditional ways of managing technology need to be radically reappraised for any company that sees technical leadership as a critical business differentiator. Through their research work and worldwide network, Joe Tidd, John Bessant and Keith Pavitt have brought together the latest thinking on innovation management, extensively illustrated with real world examples, and with pointers to how successful implementations may emerge in the future. This book is well worth reading for all who want to achieve leadership in technology management.'

David Hughes, Executive Vice President, Technology Management, Marconi plc.

'Innovation is the cornerstone of what makes businesses successful: offering something uniquely better to the consumer. Innovation, while key, is probably the most difficult (maybe even impossible) element of corporate activity to manage or plan. This book does an excellent job of setting out the specification of ways we can think about how to create innovative organizations, without prescribing a "recipe for success".'

Dr Neil MacGilp, Director, Corporate R&D, Procter & Gamble.

M A N A G I N G I N N O V A T I O N

Fourth Edition

M A N A G I N G I N N O V A T I O N

Integrating Technological, Market and Organizational Change

Fourth Edition

Joe Tidd and John Bessant



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ABOUT THE AUTHORS

Joe Tidd, BSc, MBA, DPhil, DIC is a physicist with subsequent degrees in technology policy and business administration. He is Professor of Technology and Innovation Management at SPRU (Science & Technology Policy Research), University of Sussex and visiting Professor at University College London, Copenhagen Business School and Rotterdam School of Management. He was previously Head of the Management of Innovation Specialisation and Director of the Executive MBA Programme at Imperial College and policy adviser to the CBI (Confederation of British Industry), has presented expert evidence to three Select Committee Enquiries held by the House of Commons and House of Lords. He was a researcher for the five-year, \$5 million *International Motor Vehicle Program* organized by the Massachusetts Institute of Technology (MIT) in the USA, which resulted in 'lean production'. He has worked on projects for consultants Arthur D. Little, CAP Gemini and McKinsey, and technology-based firms, including American Express Technology, Applied Materials, ASML, BOC Edwards, BT, National Power, NKT and Nortel Networks, Petrobras and Pfizer. He is the winner of the Price Waterhouse Urwick Medal for contribution to management teaching and research, and the Epton Prize from the R&D Society. He has written nine books and more than 70 papers on the management of technology and innovation, and is the Managing Editor of the *International Journal of Innovation Management*.

John Bessant, BSc, PhD currently holds the Chair in Innovation and Technology Management at Imperial College Business School, where he is also Research Director. He previously worked at Cranfield, Brighton and Sussex Universities. In 2003 he was awarded a Senior Fellowship with the Advanced Institute for Management Research and was also elected a Fellow of the British Academy of Management. Author of 15 books and many articles, he has acted as advisor to various national governments, international bodies including the United Nations, The World Bank and OECD and companies including LEGO, Novo Nordisk, Mars, UBS and Morgan Stanley.

PREFACE TO THE FOURTH EDITION

We know that those organizations that are consistently successful at managing innovation outperform their peers in terms of growth and financial performance.¹ However, managing innovation is not easy or automatic. It requires skills and knowledge, which are significantly different to the standard management toolkit and experience, because most management training and advice is aimed to maintain stability, hence the most sought after degree is an MBA (Master of Business Administration). As a result, most organizations either simply do not formally manage the innovation process, or manage it in an ad hoc way. Studies confirm that only around 12% of organizations successfully manage innovation, and only half of these organizations do so consistently across time.²

Since the first edition of *Managing Innovation* was published in 1997 we have argued that successful innovation management is much more than managing a single aspect, such as creativity, research and development or product development. Our companion texts deal with such issues more fully,³ but here we continue to promote an integrated approach, which deals with the interactions between changes in markets, technology and organization. In this fourth edition, we have tried to continue our decade-long tradition of differentiating our work from that of others by developing its unique characteristics:

- Strong evidence-based approach to the understanding and practice of managing innovation, drawing upon thousands of research projects, and, new to this edition, 'Research Notes' on the very latest research findings.
- Practical, experience-tested processes, models and tools, including new to this edition 'Views from the Front Line', first-person accounts from practising managers on the challenges they face while managing innovation.

¹ Tidd, J. (2006) *From Knowledge Management to Strategic Competence*, second edition, Imperial College Press, London.

² Jaruzelski, B. and K. Dehoff (2008) Booz Allen Hamilton Annual Innovation Survey, *Strategy and Business*, **49**.

³ Bessant, J. and J. Tidd (2007) *Innovation and Entrepreneurship*, John Wiley & Sons, Ltd, Chichester; Isaksen, S. and J. Tidd (2006) *Meeting the Innovation Challenge: Leadership for Transformation and Growth*, John Wiley & Sons, Ltd, Chichester; Bessant, J. (2003) *High-Involvement Innovation*, John Wiley & Sons, Ltd, Chichester.

- Real illustrations and case examples of innovation in action, in manufacturing and services, private and public sectors, including in-text exhibits, and from www.managing-innovation.com, full case studies, video and audio podcasts.
- Supported by extensive, growing web resources, at www.managing-innovation.com, featuring a comprehensive range of innovation tools, interactive exercises and tests to help apply the learning.

Our understanding of innovation continues to grow, by systematic research, experimentation and the ultimate test of management practice and experience. It is a challenge for all of us interested in innovation to keep abreast of this fast-developing and multi-disciplinary field. In the general field of business research, the 200 or so active research centres worldwide produce some 5000 papers each year, many relevant to managing innovation.⁴ In the more specialist field of technology management, the 120-odd research centres worldwide publish around 250 papers per annum.⁵ So since we published the first edition, there have been around 3000 pieces of specialist research added, much more general management research relevant to innovation, and a proliferation of books on the subject. One goal of this book is to help make sense of and navigate through this mass of material. Another aim is to encourage action. As we said in the first edition, and still believe strongly, this book is designed to encourage and support practice and organization-specific experimentation and learning, and not to substitute for it.

We welcome feedback and contributions, and have developed an open environment for this purpose at:

www.managing-innovation.com

Joe Tidd and John Bessant
Brighton, East Sussex, U.K.

⁴ Mangematin, V. and C. Baden-Fuller (2008) Global contests in the production of business knowledge. *Long Range Planning*, **41** (1), 117–39.

⁵ Linton, J.D. (2004) Perspective: ranking business schools on the management of technology. *Journal of Product Innovation Management*, **21**, 416–30.

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We also thank the more formal contributions made by leading academics for our 'Research Notes', especially Dave Francis, Richard Adams, Bob Phelps, Henrik Florén, Steve Flowers, Johan Frishammar, Flis Henwood, Kathrin Moeslein, J. Roland Ort, Frank Piller and Bettina von Stamm; and the many experienced practising managers of innovation who took time to contribute the insightful 'Views from the Front Line' – Simon Barnes, Stephen Bold, Ian Collins, Richard Dennis, Julian Fallon, Matt Kingdon, John Thesmer, Lester Handley, Rob Perrons, Wouter Zeeman, John Tregaskes, Dorothea Seebode, Gerard Harkin, Roy Sandbach, Anand Lakhani, Patrick McLaughlin, John Gilbert, Lucy Hooberman, David Overton, Suzana Moreira, Bertus de Jager, Pernille Weiss Terkildsen, Michael Vaag, Martin Curley, Helle Vibeke Carstensen, Arne Madsen, Bo Wesley, Francis Bealin-Kelly and Carlos de Pomme.

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HOW TO USE THIS BOOK

Features

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RESEARCH NOTE

Mohamir Sawhney, Robert Wilcott and Inigo Aronitz from the Center for Research in Technology and Innovation at the Kellogg School of Management at Northwestern University, USA, interviewed innovation managers at a number of large firms, including Boeing, DuPont, Microsoft, eBay, Motorola and Sony, and from these developed a survey questionnaire which was sent to a further nineteen firms, such as General Electric, Merck and Siemens.

Analysing these data, they derived an "innovation radar" to represent twelve dimensions of business innovation they identified. Their definition of "business innovation" does not focus on new things, but rather anything that creates new value for customers. Therefore creating new things is neither necessary nor sufficient for such value creation. Instead they propose a systematic approach to business innovation, which may take place in twelve different dimensions:

- Offerings – new products or services.
- Platform – derivative offerings based on reconfiguration of components.
- Solutions – integrated offerings which customer value.
- Customers – unmet needs or new market segments.
- Customer experience – re-design of customer contact and interactions.
- Value capture – redefine the business model and how income is generated.
- Processes – to improve efficiency or effectiveness.
- Organization – change scope or structures.
- Supply chain – changes in sourcing and order fulfillment

Web Links

Video Podcast – Finnegan's Fish Bar 

Audio Podcast – Glasses Direct 

Interactive Exercise – 4Ps tool 

Case Study – Dimming of the Light Bulb 

Research notes summarize the very latest evidence and reviews of contemporary topics

1.2 WHY INNOVATION MATTERS 15

1.2 Why innovation matters

What these organizations have in common is that their 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 novelty in their offerings (product/service) and the ways in which they create and deliver those offerings.

Innovation matters, not only at the level of the individual enterprise but increasingly as the wellspring for national economic growth. In a recent book William Baumol pointed out that "virtually all of the economic growth that has occurred since the eighteenth century is ultimately attributable to innovation"¹⁰. Innovation is becoming a central plank in national economic policy – for example, the UK Office of Science and Innovation sees it as 'the motor of the modern economy, turning ideas and knowledge into products and services'¹¹. An Australian government website puts the case equally strongly – 'Companies that do not invest in innovation put their future at risk. Their business is unlikely to prosper, and they are unlikely to be able to compete if they do not seek innovative solutions to emerging problems. According to Statistics Canada (2006), the following factors characterize successful small and medium-sized enterprises:

- Innovation is consistently found to be the most important characteristic associated with success.
- Innovative enterprises typically achieve stronger growth or are more successful than those that do not innovate.
- Enterprises that gain market share and increasing profitability are those that are innovative.

Not surprisingly this rationale underpins a growing set of policy measures designed to encourage and nurture innovation at regional and national level.

The survival/growth question poses a problem for established players but a huge opportunity for newcomers to rewrite the rules of the game. Entrepreneurs are risk-takers – but they calculate the costs of taking a bright idea forward against the potential gains if they succeed in doing something different – especially if that involves upstaging the players already in the game.

CASE STUDY 1.1

The changing nature of the music industry

April 1st 2006 – Apart from being a traditional day for playing practical jokes, this was the day on which another landmark in the rapidly changing world of music was reached. 'Crazy' – a track by Gnarl's Barkley – made pop history as the UK's first song to top the charts based on download sales alone. Commenting on the fact that the song had been downloaded more than 31,000 times but was only released for sale in the shops on April 3rd, Germano Castaldo, spokesman for retailer HMV, said: "This not only represents a watershed in how the charts are compiled, but shows that legal downloads have come of age....if physical copies fly off the shelves at the same rate it could vie for a place as the year's biggest seller".

Real-life Case Studies contextualise the topics covered

18 INNOVATION – WHAT IT IS AND WHY IT MATTERS

rules will change and leave them vulnerable. Changes along several core environmental dimensions mean that the incidence of discontinuities is likely to rise – for example in response to a massive increase in the rate of knowledge production and the consequent increase in the potential for technology-linked instabilities. But there is also a higher level of interactivity amongst these environmental elements – complexity – which leads to unpredictable emergence. (For example, the rapidly growing field of VoIP (voice over internet protocol) communications is not developing along established trajectories towards a well-defined end-point. Instead it is a process of emergence. The broad parameters are visible – the rise of demand for global communication, increasing availability of broadband, multiple peer-to-peer networking models, growing technological literacy amongst users – and the stakes are high, both for established fixed-line players (who have much to lose) and new entrants (such as Skype, recently bought by eBay for \$2.0bn). The dominant design isn't visible yet – instead there is a rich fermenting soup of technological possibilities, business models and potential players from which it will gradually emerge).

1.4: What is innovation?



One of America's most successful innovators was Thomas Alva Edison who during his life registered over 1000 patents. Products for which his organization was responsible include the light bulb, 35mm cinema film and even the electric chair. Edison appreciated better than most that the real challenge in innovation was not invention – coming up with good ideas – but in making them work technically and commercially. His skill in doing this created a business empire worth, in 1920, around \$2.1 bn. He put to good use an understanding of the interactive nature of innovation, realizing that both technology push (which he systematized in one of the world's first organized R&D laboratories) and demand pull need to be mobilized.

VIEWS FROM THE FRONT LINE

"There is nothing more difficult to take in hand, more perilous to conduct, or more uncertain in its success, than to take the lead in the introduction of a new order of things."
Niccolò Machiavelli, 'The Prince', 1532

"Anything that won't sell, I don't want to invent. Its sale is proof of utility, and utility is success."

"Everything comes to him who hauls while he waits."

"Genius is one percent inspiration and ninety-nine percent perspiration."

"I never did anything by accident, nor did any of my inventions come by accident; they came by work."

"Make it a practice to keep on the lookout for novel and interesting ideas that others have used successfully. Your idea has to be original only in its adaptation to the problem you are working on."

Thomas A. Edison

Views from the Front Line provide commentary from practising managers of innovation

Web resources

The text is supported by online resources which are indicated throughout with various icons. These resources are then fully detailed in the Weblinks section at the end of each chapter. The website, which will be integral to the use of this textbook, is

www.managing-innovation.com

The icons are used as follows:



44 INNOVATION – WHAT IT IS AND WHY IT MATTERS

Most other texts tend to focus on a single dimension of innovation management. In *The Nature of the Innovative Process*, Giovanni Dosi adopts an evolutionary economics perspective and identifies the main issues in the management of technological innovation.⁷⁵ On the subject of organizational innovation, Galbraith and Lawler summarize recent thinking on organizational structures and processes⁷⁶, although a more critical account is provided by Wölle (1994) in *Organizational Innovation: review, critique and suggested research*, *Journal of Management Studies*, 31 (3), 405–432. For a review of the key issues and leading work in the field of organizational change and learning see Cohen and Sproull (eds), *Organizational Learning* (Sage, London, 1996).

Most marketing texts fail to cover the specific issues related to innovative products and services, although a few specialist texts exist which examine the more narrow problem of marketing so-called 'high-technology' products – for example, Jolly and Moore.^{77,78} Helpful coverage of the core issues are to be found in the chapter entitled, 'Securing the future' in Hamel and Prahalad's *Competing for the Future* (Harvard Business School Press, 1994) and the chapter 'Learning from the market', in Dorothy Leonard's *Wellsprings of Knowledge* (Harvard Business School Press, 1995). There are also extensive insights into adoption behaviour drawn from a wealth of studies drawn together by Everett Rogers and colleagues.⁷⁹ Particular themes in innovation are covered by a number of books and journal special issues, for example 'services', networks and clusters^{80,81}, sustainability⁸², and discontinuous innovation^{29,83,84}.

Web Links

Here are the full details of the resources available on the website flagged throughout the text:



Case Studies:

- Kumba Resources
- Inditex
- Wind-up radios in Tanzania
- Zata
- The changing nature of the music industry
- Invention and innovation
- Model T
- Second Life
- The lighting industry
- Aravind
- 'Continuous improvement' examples
- The ice industry
- Xerox
- Finnegan's Fish Bar



Exercises:

- Strategic advantages through innovation



Video Podcast:

- The '4Fs'

The **Web Links** section at the end of each chapter gives details of all the resources available online

PART 1

Managing Innovation



CHAPTER 1

Innovation – what it is and why it matters

‘A slow sort of country’ said the Red Queen. ‘Now here, you see, it takes all the running you can do to keep in the same place. If you want to get somewhere else, you must run at least twice as fast as that!’

(Lewis Carroll, Alice through the Looking Glass)

1.1 Introduction

‘We always eat elephants . . .’ is a surprising claim made by Carlos Broens, founder and head of a successful toolmaking and precision engineering firm in Australia with an enviable growth record. Broens Industries is a small/medium-sized company of 130 employees which survives in a highly competitive world by exporting over 70% of its products and services to technologically demanding firms in aerospace, medical and other advanced markets. The quote doesn’t refer to strange dietary habits but to its confidence in ‘*taking on the challenges normally seen as impossible for firms of our size*’ – a capability which is grounded in a culture of innovation in products and the processes which go to produce them.

At the other end of the scale **Kumba Resources** is a large South African mining company which makes another dramatic claim – ‘*We move mountains*’. In their case the mountains contain iron ore and their huge operations require large-scale excavation – and restitution of the landscape afterwards. Much of their business involves complex large-scale machinery – and their ability to keep it running and productive depends on a workforce able to contribute their innovative ideas on a continuing basis.¹

Innovation is driven by the ability to see connections, to spot opportunities and to take advantage of them. When the Tasman Bridge collapsed in Hobart, Tasmania, in 1975 Robert Clifford was running a small ferry company and saw an opportunity to capitalize on the increased demand for ferries – and to differentiate his offering by selling drinks to thirsty cross-city commuters. The same entrepreneurial flair later helped him build a company – Incat – which pioneered the wave-piercing design that helped them capture over half the world market for fast catamaran ferries. Continuing investment in innovation has helped this company from a relatively isolated island build a key niche in highly competitive international military and civilian markets (www.incat.com.au).

But innovation is not just about opening up new markets – it can also offer new ways of serving established and mature ones. Despite a global shift in textile and clothing manufacture towards developing countries the Spanish company, Inditex (through its retail outlets under various names including **Zara**), has pioneered a highly flexible, fast turnaround clothing operation with over 2000 outlets in 52 countries. It was founded by Amancio Ortega Gaona who set up a small operation in the west of Spain in La Coruña – a region not previously noted for textile production – and the first store opened there in 1975. Central to the Inditex philosophy is close linkage between design, manufacture and retailing and its network of stores constantly feeds back information about trends, which are used to generate new designs. Inditex also experiments with new ideas directly on the public, trying samples of cloth or design and quickly getting back indications of what is going to catch on. Despite its global orientation,



most manufacturing is still done in Spain, and the company has managed to reduce the turnaround time between a trigger signal for an innovation and responding to it to around 15 days.

Of course, technology often plays a key role in enabling radical new options. Magink is a company set up in 2000 by a group of Israeli engineers and is now part of the giant Mitsubishi concern. Its business is in exploiting the emerging field of digital ink technology – essentially enabling paper-like display technology for indoor and outdoor displays. These have a number of advantages over other displays such as liquid crystal – low cost, high-viewing angles and high visibility even in full sunlight. One of its major new lines of development is in advertising billboards – a market worth \$5 billion in the USA alone – where the prospect of ‘programmable hoardings’ is now opened up. Magink enables high-resolution images that can be changed much more frequently than conventional paper advertising, and permit billboard site owners to offer variable price time slots, much as television does at present.²

At the other end of the technological scale there is scope for improvement on an old product, often using old technologies in new ways. People have always needed artificial limbs and the demand has, sadly, significantly increased as a result of high-technology weaponry such as mines. The problem is compounded by the fact that many of those requiring new limbs are also in the poorest regions of the world and unable to afford expensive prosthetics. The chance meeting of a young surgeon, Dr Pramod Karan Sethi, and a sculptor, Ram Chandra, in a hospital in Jaipur, India, has led to the development of a solution to this problem – the Jaipur foot. This artificial limb was developed using Chandra’s skill as a sculptor and Sethi’s expertise and is so effective that those who wear it can run, climb trees and pedal bicycles. It was designed to make use of low-tech materials and be simple to assemble – for example, in Afghanistan craftsmen hammer the foot together out of spent artillery shells whilst in Cambodia part of the foot’s rubber components are scavenged from truck tyres. Perhaps the greatest achievement has been to do all of this for a low cost – the Jaipur foot costs only \$28 in India. Since 1975, nearly 1 million people worldwide have been fitted for the Jaipur limb and the design is being developed and refined, for example, using advanced new materials.³

Innovation is of course not confined to manufactured products; plenty of examples of growth through innovation can be found in services.^{4–6} 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 model which eventually became the industry standard. A similar approach to the insurance business – Direct Line – radically changed the basis of that market and led to widespread imitation by all the major players in the sector.^{7,8} Internet-based retailers such as Amazon have changed the ways in which products as diverse as books, music and travel are sold, whilst firms like eBay have brought the auction house into many living rooms.

Public services such as healthcare, education and social security may not generate profits but they do affect the quality of life for millions of people. Bright ideas well implemented can lead to valued new services and the efficient delivery of existing ones – at a time when pressure on national purse strings is becoming ever tighter.⁹ New ideas – whether **wind-up radios in Tanzania** or micro-credit financing schemes in Bangladesh – have the potential to change the quality of life and the availability of opportunity for people in some of the poorest regions of the world. There’s plenty of scope for innovation and entrepreneurship – and at the limit – about real matters of life and death. 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.¹⁰ Public-sector innovations have included the postage stamp, the National Health Service in the UK, and much of the early development work behind technologies like fibre optics, radar and the Internet.



1.2 Why innovation matters

What these organizations have in common is that their 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 that can mobilize knowledge and technological skills and experience to create novelty in their offerings (product/service) and the ways in which they create and deliver those offerings.

Innovation matters, not only at the level of the individual enterprise but also increasingly as the well-spring for national economic growth. In a recent book Baumol pointed out that ‘*virtually all of the economic growth that has occurred since the eighteenth century is ultimately attributable to innovation*’.¹¹ The magazine *Business Week* regularly features its list of the top innovative firms in the world. It found that the median profit margin of the top 25 firms was 3.4% in the period 1995–2005 whereas the average for other firms in the S&P Global Index was only 0.4%. Similarly the median annual stock return was 14.3% for the innovators and 11.3% for the rest.¹² Another study by the consultancy Innovaro suggested that ‘innovation leaders’ had strong links between innovative activities and business performance. Its top five firms were Apple, Nokia, Google, Adidas and Reckitt Benckiser – all noted for different but distinctive innovation performance and the increase of their share prices over the year 2006–7 by between 25% and 135%. This was not just short-term success – these firms had sustained share price growth for the preceding seven years.¹³

Importantly innovation and competitive success are not simply about high-technology companies, for example, the German firm Würth is the largest maker of screws (and other fastenings such as nuts and bolts) in the world with a turnover of \$14 billion. Despite low-cost competition from China, the company has managed to stay ahead through an emphasis on product and process innovation across a supplier network similar to the model used by Dell in computers.¹⁴

Innovation is becoming a central plank in national economic policy – for example, the UK Office of Science and Innovation sees it as ‘*the motor of the modern economy, turning ideas and knowledge into products and services*’.¹⁵ An Australian government website (www.dest.gov.au/sectors/science_innovation) puts the case equally strongly: ‘*Companies that do not invest in innovation put their future at risk. Their business is unlikely to prosper, and they are unlikely to be able to compete if they do not seek innovative solutions to emerging problems.*’

According to *Statistics Canada*,¹⁶ the following factors characterize successful small- and medium-sized enterprises:

- *Innovation is consistently found to be the most important characteristic associated with success.*
- *Innovative enterprises typically achieve stronger growth or are more successful than those that do not innovate.*
- *Enterprises that gain market share and increasing profitability are those that are innovative.*

Not surprisingly this rationale underpins a growing set of policy measures designed to encourage and nurture innovation at regional and national level.

The survival/growth question poses a problem for established players but provides a huge opportunity for newcomers to rewrite the rules of the game. One person’s problem is another’s opportunity and the nature of innovation is that it is fundamentally about *entrepreneurship*. The skill to spot opportunities and create new ways to exploit them is at the heart of the innovation process. Entrepreneurs are risk-takers – but they calculate the costs of taking forward a bright idea against the potential gains if they succeed in doing something different – especially if that involves upstaging the players already in the game.

Innovation contributes in several ways. For example, research evidence suggests a strong correlation between market performance and new products.^{17, 18} 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.⁷ And 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 only a couple of years to develop – being able to replace products frequently with better versions is increasingly important.¹⁹ ‘Competing in time’ reflects a growing pressure on firms not just to introduce new products but also to do so faster than competitors.²⁰

At the same time new product development is an important capability because the environment is constantly changing. Shifts in the socioeconomic 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 marketplace, *process* innovation plays just as important a strategic role. Being able to make something no one else can, or to do so in ways that are better than anyone else, is a powerful source of advantage. For example, the Japanese dominance in the late twentieth century across several sectors – cars, motorcycles, shipbuilding, consumer electronics – owed a great deal to superior abilities in manufacturing – something which resulted 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.²¹ One of the main reasons for the ability of relatively small firms like Oxford Instruments or Incat to survive in highly competitive global markets is the sheer complexity of what they make and the huge difficulties a new entrant would encounter in trying to learn and master their technologies.

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 automated telling machinery (ATM) services 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,²² and the same model has been used to great effect by the Spanish firm Zara. Southwest Airlines achieved an enviable position as the most effective airline in the USA despite being much smaller than its rivals; its success was due to process innovation in areas such as reducing airport turnaround times.²³ This model has subsequently become the template for a whole new generation of low-cost airlines whose efforts have revolutionized the once-cosy world of air travel.

Importantly we need to remember that the advantages which flow from these innovative steps gradually get competed away as others imitate. Unless an organization is able to move into further innovation, it risks being left behind as others take the lead in changing their offerings, their operational processes or the underlying models that drive their business. For example, leadership in banking has passed to others, particularly those who were able to capitalize early on the boom in information and communications technologies; in particular many of the lucrative financial services like securities and share dealing have been dominated by players with radical new models such as Charles Schwab.²⁴ As all retailers adopt advanced IT so the lead shifts to those who are able – like Zara and Benetton – to streamline their production operations to respond rapidly to the signals flagged by the IT systems.

BOX 1.1

The innovation imperative

In the mid-1980s a study by Shell suggested that the average corporate survival rate for large companies was only about half as long as that of a human being. Since then the pressures on firms have increased enormously from all directions – with the inevitable result that business life expectancy is reduced still further. Many studies look at the changing composition of key indices and draw attention to the demise of what were often major firms and in their time key innovators. For example, Foster and Kaplan point out that of the 500 companies originally making up the Standard & Poor 500 list in 1957, only 74 remained on the list through to 1997.²⁴ Of the top 12 companies which made up the Dow Jones Index in 1900 only one – General Electric – survives today. Even apparently robust giants like IBM, GM or Kodak can suddenly display worrying signs of mortality, whilst for small firms the picture is often considerably worse since they lack the protection of a large resource base.

Some firms have had to change dramatically to stay in business. For example, a company founded in the early nineteenth century, which had Wellington boots and toilet paper amongst its product range, is now one of the largest and most successful in the world in the telecommunications business. Nokia began life as a lumber company, making the equipment and supplies needed to cut down forests in Finland. It moved through into paper and from there into the ‘paperless office’ world of IT – and from there into mobile telephones.

Another mobile phone player – Vodafone Airtouch – grew to its huge size by merging with a firm called Mannesman which, since its birth in the 1870s, has been more commonly associated with the invention and production of steel tubes! TUI owns Thomson (the travel group) in the UK, and is the largest European travel and tourism services company. Its origins, however, lie in the mines of old Prussia where it was established as a public sector state lead mining and smelting company!²⁵

CASE STUDY 1.1**The changing nature of the music industry**

1 April 2006. Apart from being a traditional day for playing practical jokes, this was the day on which another landmark in the rapidly changing world of music was reached. ‘Crazy’ – a track by Gnarls Barkley – made pop history as the UK’s first song to top the charts based on download sales alone. Commenting on the fact that the song had been downloaded more than 31 000 times but was only released for sale in the shops on 3 April, Gennaro Castaldo, spokesman for retailer HMV, said: *‘This not only represents a watershed in how the charts are compiled, but shows that legal downloads have come of age . . . if physical copies fly off the shelves at the same rate it could vie for a place as the year’s biggest seller’.*

One of the less visible but highly challenging aspects of the Internet is the impact it has had – and is having – on the entertainment business. This is particularly the case with music. At one level its impacts could be assumed to be confined to providing new ‘e-tailing’ channels through which you can obtain the latest CD of your preference – for example from Amazon or CD-Now or 100 other websites. These innovations increase the choice and tailoring of the

music-purchasing service and demonstrate some of the ‘richness/reach’ economic shifts of the new Internet game.

But beneath this updating of essentially the same transaction lies a more fundamental shift – in the ways in which music is created and distributed and in the business model on which the whole music industry is currently predicated. In essence the old model involved a complex network where songwriters and artists depended on A&R (artists and repertoire) staff to select a few acts, production staff who would record in complex and expensive studios, other production staff who would oversee the manufacture of physical discs, tapes and CDs, and marketing and distribution staff who would ensure the product was publicized and disseminated to an increasingly global market.

Several key changes have undermined this structure and brought with it significant disruption to the industry. Old competencies may no longer be relevant – whilst acquiring new ones becomes a matter of urgency. Even well-established names like Sony find it difficult to stay ahead when new entrants are able to exploit the economics of the Internet. At the heart of the change is the potential for creating, storing and distributing music in digital format – a problem which many researchers have worked on for some time. One solution, developed by one of the Fraunhofer Institutes in Germany, is a standard based on the Motion Picture Experts Group (MPEG) level 3 protocol – MP3. MP3 offers a powerful algorithm for managing one of the big problems in transmitting music files – that of compression. Normal audio files cover a wide range of frequencies and are thus very large and not suitable for fast transfer across the Internet – especially with a population who may only be using relatively slow modems. With MP3 effective compression is achieved by cutting out those frequencies which the human ear cannot detect – with the result that the files to be transferred are much smaller.

Therefore MP3 files can be moved across the Internet quickly and shared widely. Various programs exist for transferring normal audio files and inputs – such as CDs – into MP3 and back again.

What does this mean for the music business? In the first instance aspiring musicians no longer need to depend on being picked up by A&R staff from major companies who can bear the costs of recording and production of a physical CD. Instead they can use home recording software and either produce a CD themselves or else go straight to MP3 – and then distribute the product globally via newsgroups, chatrooms, etc. In the process they effectively create a parallel and much more direct music industry, which leaves existing players and artists on the sidelines.

Such changes are not necessarily threatening. For many people the lowering of entry barriers has opened up the possibility of participating in the music business, for example, by making and sharing music without the complexities and costs of a formal recording contract and the resources of a major record company. There is also scope for innovation around the periphery, for example in the music publishing sector where sheet music and lyrics are also susceptible to lowering of barriers through the application of digital technology. Journalism and related activities become increasingly open – now music reviews and other forms of commentary are possible via specialist user groups and channels on the web whereas before they were the province of a few magazine titles. Compiling popularity charts – and the related advertising – is also opened up as the medium switches from physical CDs and tapes distributed and sold via established channels to new media such as MP3 distributed via the Internet.

As if this were not enough the industry is also challenged from another source – the sharing of music between different people connected via the Internet. Although technically illegal this practice of sharing between people's record collections has always taken place – but not on the scale which the Internet threatens to facilitate. Much of the established music industry is concerned with legal issues – how to protect copyright and how to ensure that royalties are paid in the right proportions to those who participate in production and distribution. But when people can share music in MP3 format and distribute it globally the potential for policing the system and collecting royalties becomes extremely difficult to sustain.

It has been made much more so by another technological development – that of peer-to-peer or P2P networking. Sean Fanning, an 18-year-old student with the nickname 'the Napster', was intrigued by the challenge of enabling his friends to 'see' and share between their own personal record collections. He argued that if they held these in MP3 format then it should be possible to set up some kind of central exchange program which facilitated their sharing.

The result – the Napster.com site – offered sophisticated software that enabled P2P transactions. The Napster server did not actually hold any music on its files – but every day millions of swaps were made by people around the world exchanging their music collections. Needless to say this posed a huge threat to the established music business since it involved no payment of royalties. A number of high-profile lawsuits followed but whilst Napster's activities have been curbed the problem did not go away. There are now many other sites emulating and extending what Napster started – sites such as Gnutella, Kazaa and Limewire took the P2P idea further and enabled exchange of many different file formats – text, video, etc. In Napster's own case the phenomenally successful site concluded a deal with entertainment giant Bertelsman that paved the way for subscription-based services to provide some revenue stream to deal with the royalty issue.

Expectations that legal protection would limit the impact of this revolution have been dampened by a US Court of Appeal ruling which rejected claims that P2P violated copyright law. Their judgement said, '*History has shown that time and market forces often provide equilibrium in balancing interests, whether the new technology be a player piano, a copier, a tape recorder, a video recorder, a PC, a karaoke machine or an MP3 player*' (*Personal Computer World*, November 2004, p. 32).

Significantly the new opportunities opened up by this were seized not by music industry firms but by computer companies, especially Apple. In parallel with the launch of its successful iPod personal MP3 player Apple opened a site called iTunes which offered users a choice of thousands of tracks for download at 99 cents each. In its first weeks of operation it recorded 1 million hits. In February 2006 the billionth song ('Speed of Sound') was purchased as part of Coldplay's 'X&Y' album by Alex Ostrovsky from West Bloomfield, Michigan. '*I hope that every customer, artist, and music company executive takes a moment today to reflect on what we've achieved together during the past three years,*' said Steve Jobs, Apple's CEO. '*Over one billion songs have now been legally purchased and downloaded around the globe, representing a major force against music piracy and the future of music distribution as we move from CDs to the Internet.*'

This has been a dramatic shift, reaching the point where more singles were bought as downloads in 2005 than as CDs, and where new players are beginning to dominate the game – for example, Tesco and Microsoft. And the changes don't stop there. In February 2006 the Arctic

Monkeys topped the UK album charts and walked off with a fistful of awards from the music business – yet their rise to prominence had been entirely via ‘viral marketing’ across the Internet rather than by conventional advertising and promotion. Playing gigs around the northern English town of Sheffield, the band simply gave away CDs of their early songs to their fans, who then obligingly spread them around on the Internet. *‘They came to the attention of the public via the Internet, and you had chat rooms, everyone talking about them,’* says a slightly worried Gennaro Castaldo of HMV Records. David Sinclair, a rock journalist suggests that *‘It’s a big wakeup call to all the record companies, the establishment, if you like . . . This lot caught them all napping . . . We are living in a completely different era, which the Arctic Monkeys have done an awful lot to bring about.’*

The writing may be on the wall for the music industry in the same way as the low-cost airline business has transformed the travel business. And behind the music business the next target may be the movie and entertainment industry where there are already worrying similarities. Or the growing computer games sector with shifts towards more small-scale developers emulating the Arctic Monkeys and using viral marketing to build a sales base.

With the rise of the Internet the scope for service innovation has grown enormously – not for nothing is it sometimes called ‘a solution looking for problems’. As Evans and Wurster point out, the traditional picture of services being either offered as a standard to a large market (high ‘reach’ in their terms) or else highly specialized and customized to a particular individual able to pay a high price (high ‘richness’) is ‘blown to bits’ by the opportunities of web-based technology. Now it becomes possible to offer both richness and reach at the same time – and thus to create totally new markets and disrupt radically those which exist in any information-related businesses.²⁶

The challenge that the Internet poses is not only one for the major banks and retail companies, although those are the stories which hit the headlines. It is also an issue – and quite possibly a survival one – for thousands of small businesses. Think about the local travel agent and the cosy way in which it used to operate. Racks full of glossy brochures through which people could browse, desks at which helpful sales assistants sort out the details of selecting and booking a holiday, procuring the tickets, arranging insurance and so on. And then think about how all of this can be accomplished at the click of a mouse from the comfort of home – and that it can potentially be done with more choice and at lower cost. Not surprisingly, one of the biggest growth areas in dotcom start-ups was the travel sector and whilst many disappeared when the bubble burst, others like lastminute.com and Expedia have established themselves as mainstream players.

Of course, not everyone wants to shop online and there will continue to be scope for the high-street travel agent in some form – specializing in personal service, acting as a gateway to the Internet-based services for those who are uncomfortable with computers, etc. And, as we have seen, the early euphoria around the dotcom bubble has given rise to a much more cautious advance in Internet-based business. The point is that whatever the dominant technological, social or market conditions, the key to creating – and sustaining – competitive advantage is likely to lie with those organizations which continually innovate.

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