3 Innovation

CONTENTS

CASE INSIGHTS

Learning outcomes

When you have read this chapter and undertaken the related activities you will be able to:

- Explain the meaning of innovation, its purpose and how it can be measured in a number of dimensions;
- Explain the links between creativity, invention, innovation and entrepreneurship;
- Explain how radical innovation might be stimulated and business models challenged so as to potentially cause a shift in market paradigms;
- Explain the relationship between innovation and risk, profitability and growth;
- Explain how innovation is reflected in different-sized companies and in different industry structures.

THE PURPOSE OF INNOVATION

Entrepreneurial architecture seeks to create within an organization an entrepreneurial orientation that results in greater entrepreneurial intensity, measured in Figure 2.1 as frequency and scale of entrepreneurial outputs. But what is the purpose of these outputs? What is the aim of innovation? Theories of 'industrial evolution', supported by empirical evidence, have linked entrepreneurship and economic growth directly (Audretsch, 1995; Ericson and Pakes, 1995; Hopenhayn, 1992; Jovanovic, 1982; Klepper, 1996; Lambson, 1991). They focus on change as the central phenomenon and emphasize the role knowledge plays in charting a way through this. Innovation is seen as the key to market entry, growth and survival for an enterprise and the way entire industries change over time. Innovation, therefore, is at the heart of entrepreneurship. Entrepreneurs use it to create change and opportunity. They use it to create profit and sustain competitive advantage. And, occasionally, they use it to create entirely new industries. Firms that grow do so because they innovate in some way. For all firms, of any size, innovation has become something of a Holy Grail to be sought after and encouraged, and the same applies to nations as they strive to see their economies grow. In the words of Michael Porter (1990): 'Invention and entrepreneurship are at the heart of national advantage'.

However, innovation need not be just about economic or monetary benefit, as traditional economists might define it. Innovation can contribute just as much to social and environmental well-being. Indeed the two can go hand in hand, with changes in business processes leading to increased profit. For example, by recovering and remanufacturing key component parts used in its products, the construction equipment manufacturer Caterpillar found that it increased its profits on those product lines by 50 per cent, whilst cutting its energy and water usage by 90 per cent. Economists such as Kate Raworth (2017) see this becoming the norm with industrial manufacturing beginning on a 'metamorphosis from degenerative to regenerative design', whereby products become part of a circular economy which makes greater use of naturally renewable materials and repairs, reuses, refurbishes and recycles existing products so as to recapture value at each stage of decomposition. Innovation can include the development of business models that include this concept of regenerative design. Raworth defines economic well-being far more broadly to encompass monetary, social and environmental well-being saying that 'the business of business is to contribute to a thriving world'. She also sees new organizational structures such as cooperatives, not-for-profits and community interest companies as giving business a values-driven **mission** or 'living purpose' and distributing income more evenly. Innovation, therefore, can create many benefits for society as a whole, not just the organization that undertakes it.

mission The formal statement of business purpose – what the business aims to achieve and how it will achieve it

Furthermore, entrepreneurial innovation is not something to be undertaken just by the private sector. Ruttan (2006) argued that large-scale and long-term government investment has been behind the development of almost every general purpose technology in the last century: for example, mass-production systems, nuclear power and aviation, space, information and internet technologies. Mazzucato (2018) argued that it is the State that funds, if not undertakes, much of the early-stage (i.e., the riskiest) innovation. For example, of all US government-funded R&D in 2008 (26%), more than half of that (57%) went to basic research. The private sector in 2008, meanwhile, funded 67% of US R&D but of that only 18 per cent went to basic research. She points out that the private sector has engaged more in the later stages of innovation but has often benefitted greatly from the research undertaken or funded by the public sector. She cites the big pharmaceuticals as

particularly poor at basic research, preferring instead to 'buy-in' the research from small biotech firms or public labs and focus instead on the development and roll-out stages: 'it is especially the government labs and government-backed universities that invest in the research responsible for producing the most radical new drugs'. She points out that Apple's highly successful iPhone and iPad capitalize on government investments in the technologies that underpin them: the internet, GPS (global positioning system), touch-screen and communications technologies.

These views are echoed by many others. Janeway (2018) writes: 'From the first Industrial Revolution on the state has served as an enabler – sometimes an engine – of economic development, subsidizing if not directing the deployment of transformational technology and, more recently, taking responsibility for funding the advance of science and engineering from which economically significant innovation has come to be derived.' He called it a 'Three-Player Game' in which 'state investment in fundamental research induces financial speculation to fund construction of transformational technological infrastructure, whose exploitation, in turn, raises living standards'. The private sector is seen as best at commercializing opportunities, but then they have a tendency to develop their monopoly power rather than focusing on further innovation, leaving the field open to new, smaller companies. He cites the example of Xerox's patented and highly profitable position in the copier market causing it to refuse to commit funds to turn invention into commercially significant innovation, which in turn led many employees to leave to start their own businesses. Remember it was Xerox that invented, but failed to exploit, the graphical user interface that was managed by a mouse. Janeway sees the process as inherently unstable: 'a world in which bubbles and crashes in the financial system spill over and liquidate both the employed and their employers'. And yet these bubbles have been the vehicle for mobilizing capital on the scale needed to finance these new high-risk ventures.

DEFINING AND MEASURING INNOVATION

The literature on innovation is vast. This book focuses particularly on later-stage innovation, when it is more easily exploited commercially and it is therefore concerned not just with technology but also new ways of marketing. Innovation is probably most simply defined as 'new ways of doing something'. Kanter (1983) defined innovation as 'the generation, acceptance and implementation of new ideas, processes, products and services . . . [which] involves creative use as well as original invention'. Schumpeter (1996) described five types of innovation, emphasizing 'newness':

1. The introduction of a *new* or improved good or service.
2. The introduction of a *new* process.
3. The opening up of a *new* market.
4. The identification of *new* sources of supply of raw materials.
5. The creation of *new* types of industrial organization. This would include organizational architecture, where the components are configured in new ways.

What constitutes 'newness' is debatable, often based more on perception than reality. More recently, Proctor (2014) defined innovation very narrowly as the 'practical application of new inventions into marketable products and service' – a definition that excludes the last three types of innovation on Schumpeter's list. The reality is that there are dozens of

definitions of innovation. In the face of so many different definitions, Figure 3.1 depicts innovation very simply in three dimensions, with each dimension measured on a scale that ranges from incremental to radical:

radical innovation The creation of radically new products or services, including **market paradigm shift** (see definition)

Product/service innovation – A completely new product or service or improvements in its design and/or functional qualities. The internet was a **radical innovation**, whereas anti-lock brakes for cars were an incremental innovation. Some radical innovations, like the internet, can lead to the development of whole new industries. Any successful innovation needs to be safeguarded through intellectual property (IP) rights or they risk being copied. This is particularly important for radical innovations that may be the result of high up-front investment in R&D. For example, drug companies depend heavily on their IP rights to ensure sufficient income to justify the initial investment is generated from new breakthrough drugs.

Process innovation – Revisions to how a product or service is produced so that it is better or cheaper (e.g. by the substitution of a cheaper material in an existing product). The robot assembly line was a radical process innovation whereas merging two elements of assembly would be incremental. This is important because it can make a product or service difficult to copy.

Marketing innovation – Improvements in the marketing of an existing product or service, or even a better way of distributing or supporting an existing product or service. Selling direct to the public via telephone or the internet was a radical marketing innovation, whereas gorilla marketing or the use of social media was an incremental innovation. Innovation does not emerge just from R&D in products and processes. Entrepreneurial firms, in particular, are often innovative in their approach to marketing, finding more effective, often cheaper, routes to market. However, whilst innovations in marketing may be cheaper than other forms of innovation they are also more easily copied. Nevertheless, product/service innovations have a life-cycle, meaning that the most appropriate **marketing strategy** at each stage in the cycle is likely to be different and innovations in strategy need to take place especially later in this cycle (this is a topic we return to in Chapter 15).

marketing strategy How the value proposition is delivered to customer segments

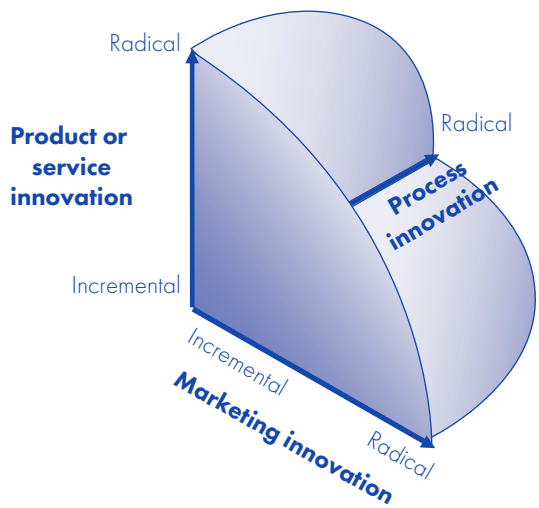

Figure 3.1 Product, process and marketing innovation

Linking these dimensions of innovation is business model innovation. This is about developing distinctively different business models – plans for how a business competes, uses its resources, structures its relationships, communicates with customers, creates value and generates profit. It may involve innovations in all three dimensions: products and processes as well as marketing. The development of iTunes has been called a breakthrough innovation that revolutionized the music business by linking technology in the iPod to a business model that monetarized recorded music at a time when CD sales were falling and it was being pirated and downloaded for free.

Innovation in the architecture of an organization, so as to make it more entrepreneurial, can make the organization more competitive and deliver higher levels of performance. Furthermore, whereas innovations in products, processes and marketing might be copied by competitors, architectural innovation is more difficult to copy, making it more sustainable. The rest of this chapter, however, is concerned with the more obvious forms of product, process and market innovation.

If defining innovation is difficult, so too is measuring it. There is no quantifiable scale for measuring innovation (Baregheh et al., 2009; Edison et al., 2013; Garcia and Calantone, 2002). What constitutes incremental or radical innovation in Figure 3.1 is a matter of judgement. To an economist, for a product to be completely or radically different from another the **cross elasticity of demand** must be zero (changes in demand for it do not affect demand for the other). Simply introducing a new product or service that is similar to others is not innovative, even if it is a replacement for an existing one. The cross elasticity of demand is not zero. New cars are rarely truly innovative, whatever the marketing hype might say. However, arguably the Mini was innovative because it changed the way cars were designed and changed the way people perceived vehicle size – a case of perception being just as important as reality.

cross elasticity of demand How demand reacts to changes in price

RADICAL PRODUCT/SERVICE INNOVATION

Radical innovation is usually associated with a 'mould-breaking' development of a 'new-to-the-world' product or process (the materials used, the process employed or how the firm is organized to deliver them). Radical innovation can be disruptive – changing markets, industries, even societies. New-to-the-world industries have been created for centuries; water power, textiles and iron in the eighteenth century, steam, steel and rail in the nineteenth century, and electricity, chemicals and the internal combustion engine in the early twentieth century. Now we have computers and mobile technologies which continue to disrupt entire industries, for example Google's driverless car (threatening the car industry) and Amazon's Fresh (threatening the fresh-food industry). The internet and cloud-based services have lowered the barriers to entry in many industries – facilitating market entry, offering automation and economies of scale and lowering capital costs. The next radical, disruptive innovations are likely to revolve around artificial intelligence and nanotechnology. The precise nature of the innovations in these areas is difficult to predict, but much of the basic research around them has already been undertaken and largely funded by governments. Now there are enormous commercial opportunities for the private sector to exploit. This will likely cause enormous economic booms that will eventually peter out as the technologies mature and market opportunities are fully exploited.

Invention is probably the clearest example of radical innovation. It is often linked with new technologies, often the product of research and sometimes a spin-off from other

research or technological developments. For example, the 'invention' of the internet or 'World Wide Web' (www) by Tim Berners-Lee grew out of a small US Defense Department network project connecting researchers and was developed for computers installed at CERN (the European Organization for Nuclear Research). Examples abound of inventions that are not commercially successful and even more of inventors who did not benefit from their inventions. English scientist Charles Babbage outlined the principles of a mechanical analytical engine or universal calculator – a forerunner of the computer. It was programmed by punch cards, had a store of information (memory) and a calculating engine (processor). But he was forever tinkering with his design and could not find anyone to pay him to make the machine. Instead, he went on to try to devise a foolproof system for betting on horses. Thomas Edison, probably the most successful inventor of all time, was so incompetent at introducing his inventions to the marketplace that his backers had to remove him from every new business he founded. Even Tim Berners-Lee did not benefit directly from his invention. Others, like the founders of numerous internet firms, created businesses and made their fortunes from his invention.

So invention is only one extreme example of innovation and both are linked to successful commercialization. But market demand for a radically new product or service can be difficult to determine because potential customers have no experience of it and how it might be used. Traditional market research techniques appear ill-suited when it comes to predicting customer acceptance of more radical forms of innovation (Deszca et al., 1999). Because of this much of the basic research for this radical innovation is undertaken or funded by government. In addition, large companies with sunk costs in established technologies often appear unwilling to exploit radical innovations, even if the development has been undertaken by others and affects markets in which they are dominant (e.g. the established fossil fuel producers and the more sustainable forms of energy production and storage). Organizations that are able (and willing) to both explore and exploit innovations simultaneously have been called 'ambidextrous' – a term originally used by Duncan (1976) and popularized by March (1991). Much of the literature on **organizational ambidexterity** revolves around issues of structure, culture and leadership, and resonates with the approach taken by this book in developing an entrepreneurial architecture (e.g., Gibson and Birkinshaw, 2004; Tushman and O'Reilly, 1996).

organizational ambidexterity The ability to both explore and exploit innovations simultaneously

Organizational ambidexterity is not easy and often it is left to the entrepreneur to exploit the commercial application for an invention. Henry Ford did not invent the car but he did revolutionize the way cars were produced and sold, moving from craft-based to production-line manufacture, and from bespoke orders from wealthy customers to affordable cars sold through dealerships (Case insight 10.3). These approaches to innovation can be every bit as valuable as the more traditional invention. As we saw in Case insight 1.4, Steve Jobs never invented anything but he did apply technologies developed by others so as to revolutionize three industries – personal computers, music and film animations. He launched the Apple personal computer when market research told IBM that there was not a viable market for it. Jobs was able to foresee applications for personal computers that others could not. He never trusted market research or focus groups, preferring instead to rely on his own instincts. This entrepreneurial insight plays a vital role in the process of innovation. Entrepreneurs seem able to link technologies to market opportunities and in so doing make the technology more usable for, and therefore more attractive to, consumers. In their study of technology-based innovation, Phadke and Vyakarnam (2017) found this synthesis skill of critical importance in bringing an innovation to the market, but that it was in conflict with the scientific tradition which values analysis rather than synthesis.

CASE INSIGHT 3.1
Rolls-Royce and Finferries

UK  Finland 

PARTNERSHIP WORKING

In 2018 Rolls-Royce Holdings and the Finnish state-owned ferry operator Finferries began collaborating on a research project called SVAN (Safer Vessel with Autonomous Navigation), implementing the findings from an earlier Advanced Autonomous Waterborne Applications (AAWA) research project, which had been funded by Business Finland (a government research-funding agency). SVAN saw the car ferry *Falco* (which already had Rolls-Royce engines) fitted with a range of Rolls-Royce Ship Intelligence technologies. Later that same year, after some 400 hours of sea trials, the ferry successfully completed a show-case voyage with some 80 VIPs in the Turku archipelago of Finland. The entire voyage was conducted under remote control and without human intervention.

The *Falco* was equipped with a range of advanced sensors which, combined with artificial intelligence, allowed it to build up a detailed picture of its surroundings, in real time and with a degree of accuracy beyond that of the human eye. This was relayed to Finferries' operations centre, some 50 kilometres away in the city of Turku, where a captain monitored the autonomous operations and could have taken control of the vessel if necessary. The autonomous navigation system includes an automatic collision avoidance and an automatic berthing system, which automatically alters course and speed when approaching the quay allowing the ship to dock safely, again without human intervention.

Visit the website: **www.rolls-royce.com**

Questions:

1. Who were the partners in this innovation and what were their roles?
2. What are the implications of having autonomous ferries in the near future? Is this a disruptive innovation?

BUSINESS MODEL INNOVATION

As already defined, business model innovation is about developing innovative plans for how a business competes, uses its resources, structures its relationships, communicates with customers, creates value and generates profit. It may involve changes to products and processes. As with all innovation, it can be anything from incremental to radical. Radical business model innovations create **market paradigm shift**. They change the way people think about products or services and create whole new markets where none existed before. Based on a sample of 108 companies, Kim and Mauborgne (2005) estimated that, whereas only 14 per cent of innovations created these new markets, these innovations delivered 38 per cent of new revenues and 61 per cent of increased profits.

market paradigm shift Changes in established market conventions associated with the creation of radically new markets

A good example of market paradigm shift is the development of low-cost airlines like Southwest (USA), easyJet (UK) and Ryanair (Ireland). Before the launch of these airlines, flagship carriers like British Airways (UK) and Pan American (USA) offered a premium service targeted at businesspeople and the wealthy. Managers in these companies accepted this established way of doing things and, given their cost structures, did not believe air

travel could be offered to everyone. They did not even consider changing their business model. The low-cost airlines created a whole new market for low-price air travel targeted at ordinary people by changing the airline business model to ensure the minimization of costs. Although the basic product remained unaltered (safe air travel from one point to another), the service offered to passengers was pared back to a minimum or charged as extra (e.g., no seat allocation, no food or drink, lower baggage allowances etc.), operations were re-engineered to minimize costs (e.g., fewer cabin crew, longer pilot air-time, fast airport turnaround etc.) and marketing altered so as to ensure that passenger numbers were maximised (e.g., aggressive promotion, differential pricing based on early booking, virtual ticketing etc.). Everything about how the basic product was delivered to passengers was changed. As a result, a whole new market was created and many of the flagship carriers went out of business.

Often market paradigm shifts are made possible by developments in technologies, such as the internet, but they might arise through the emergence of new environmental conditions, untapped markets with different value expectations or even changes in legal requirements. Paradigm shift happens when the things customers value from a product or service are challenged. Sometimes doing things differently can add value for the customer without involving extra costs. Sometimes doing things differently can reduce costs whilst still allowing a high price to be charged. Sometimes additional revenues might be derived from sources other than the main activity of a business, allowing the price of a product or service to be reduced. This concept has been used to good effect by internet companies who offer 'free' services to customers but sell data on them to advertisers and others.

In most sectors, there are factors that managers believe are critical to the success of their business. These paradigms have probably endured for a long time and become part of the dominant logic of an industry. They filter the information managers receive, subconsciously interpreting environmental data in a certain way. Managers are constrained in their thinking by their prior knowledge (Venkatarman, 1997). They may consider only the information that they believe relevant to their prevailing dominant logic. As circumstances and the environment change, the managers running the industry may not adapt their way of thinking, leaving opportunities for others to capitalize on.

This blindness is the main reason existing businesses miss out on disruptive innovation. In his study of a number of industries, Christensen (1997) characterized this as happening in stable markets where companies were geared up to delivering more of what existing customers wanted. They did not want to disrupt an existing dominant market position. Reinforcing trends we noted in Chapter 1, he observed that with each generation almost all of the previously successful large firms failed to make the transition effectively and were often squeezed out of the market or into **bankruptcy**, despite the fact they were often exemplars of good practice – ploughing a high percentage of earnings into R&D; having strong working links with their supply chain; working with lead customers to better understand their needs and develop product innovations; delivering a continuous stream of product and process innovations that were in demand from their existing customers. The problem they had was their inability to identify and capitalize on the emergence of *new markets* with very different needs and expectations – one aspect of the problem of *market disruption*. Essentially, these firms were too close to their existing

bankruptcy When you are unable to pay your debts and a court order is obtained by creditors to have your affairs placed in the hands of an official receiver

customers, suppliers and technologies. The result was that they failed to see the long-term potential of newly emerging markets. What might have begun as a fringe business – often for something simpler and cheaper – moved into the mainstream and eventually changed the rules under which the mainstream businesses operated so, by the time the mainstream businesses realized this, they had lost their competitive advantage. Often, with the benefit of hindsight, the industry seemed to be driven by technological developments in their existing products rather than by developments in new technologies or changing market demand.

CASE INSIGHT 3.2
Bill Gates and Microsoft

USA

BARRIERS TO INNOVATION

Bill Gates and Microsoft is probably the most outstanding business success story of a generation. Now a billionaire, he stepped down as CEO of Microsoft in 2000 and retired as 'Chief Software Architect' in 2008. Five years before stepping down as CEO, he wrote an internal memo that has become increasingly pertinent:

> *Developments on the internet over the next several years will set the course of our industry for a long time to come ... I have gone through several stages of increasing my views of its importance. Now I assign the internet the highest level of importance. In this memo I want to make it clear that our focus on the internet is crucial to every part of our business. The internet is the most important single development to come along since the IBM PC was introduced in 1981.*

Unfortunately, he and the company did not seem to take any notice and, arguably, missed the internet revolution. By 2014, Microsoft had only just started to focus on its importance and was falling behind competitors. With sales of Windows and Microsoft Office falling sharply, it was forced to announce a 'far-reaching realignment of the company' to enable it to respond more quickly to change, 'focusing the whole company on a single strategy'. This involved disbanding product groups, making redundancies and reorganizing itself into functional lines such as engineering, marketing, advanced strategy and research. Since then it has been playing 'catch up' with the other US tech giants (see Case insight 15.4).

With its dominant market position and enormous resources, Microsoft could have dominated the search engine market rather than Google, but new developments that threatened to cannibalize their main source of revenue – the Window Operating System and the Microsoft Office suite – were not allowed to surface. The dominant logic within the company was to continue to exploit its extremely profitable existing product/market offering. Resources were therefore targeted at defending Microsoft's existing dominance of the software market rather than exploring more disruptive innovations.

Visit the website: **www.microsoft.com**

Questions:

1. How difficult is it to break away from the dominant logic within an organization?
2. How difficult is it to 'predict' the future in business?

CASE INSIGHT 3.3
Rolls-Royce and TotalCare®

UK 

PRODUCT/SERVICE AND BUSINESS MODEL INNOVATION

The aero-engine manufacturer Rolls-Royce is known for the quality of its engines and the excellence of its after-sales service. It is also known for the innovations it has introduced in its engine designs, particularly with its newer 'lean-burn' and 'intelligent' engines, with sensors that predict when intervention is required – a service or the replacement of parts. This is beamed back so that parts can be delivered in advance to certain airports where the work can be undertaken. In the past this might have been undertaken by the airline or another service provider, priced on a time and material basis.

The introduction of the Rolls-Royce TotalCare programme was a radical innovation that changed the nature of what the company was selling – from a product to a service. Instead of buying a jet engine and a service package, Rolls-Royce enters into a contract with the airline based upon a fee for every hour the engine runs. Customers pay for engine power as they used it. Rolls-Royce then monitors the data from the sensors built into the engine to determine the need for service or parts replacement, which Rolls-Royce then arranges. They effectively guarantee engine availability. The airline is buying a service rather than a product, allowing it to move from investing significant fixed costs in engine maintenance to a variable cost – a business model that now dominates the industry and facilitated the growth of low-cost airlines. For Rolls-Royce, the TotalCare programme effectively 'locks-in' customers to the company and securing its parts business – a win-win situation for the company and its customers.

This new business model also had beneficial consequences for the environment. Rather than minimizing the initial engine cost, it created a strong incentive for the company to re-engineer its engines so as to minimize their total lifetime costs. That can mean factoring in higher quality so as to minimize service and repair time. Because the engines always belong to Rolls-Royce, it also means that they can design them so as to maximize the potential for reuse when the TotalCare contract comes to an end and, ultimately, recycling when the engines come to the end of their economic life. The TotalCare programme has proved so successful that most of Rolls-Royce's income now comes from this service, rather than the direct sale of engines.

Visit the website: **www.rolls-royce.com**

Questions:

1. How dependent on other forms of innovation was the development of the TotalCare programme?
2. What problems does a company face when it moves from selling a product to a service? Does this mean it has to change its business model?

CHALLENGING MARKET PARADIGMS

Chaston (2015) argued that you can challenge the market conventions on which established business models are based systematically and then develop new solutions and different models that are more attractive to customers. This is something that entrepreneurs do all the time as they seek to disrupt existing, already proven markets without incurring the often high cost and high risk of radical product innovation. Kim and Mauborgne (2005) called this '**blue ocean strategy**' – finding market needs that are currently unrecognized and unmet. These approaches are outlined in Chapter 10. Both involve challenging the established status quo – the dominant logic of an industry – and asking whether customer needs can be better met in some other way.

blue ocean strategy
The strategy of finding uncontested market space and creating new demand – essentially market paradigm shift

> *Reinventing the wheel is risky and usually money and time-consuming – both of which would-be entrepreneurs normally lack. However, improving something that is already on the market means there is a demand for the product and you can just do it better with some lateral, creative thinking. That's not to say entrepreneurs should be discouraged from trying something revolutionary. But if you look through history, almost every super successful entrepreneur took an existing idea or business and made it better.*
>
> Adam Schwab, founder Lux Group, Business Review Australia issuu.com, July 2014

Going to the heart of any challenge to the established conventions around business models is an approach to marketing called '**service-dominant logic**'. In their award-winning paper, Vargo and Lusch (2004) argued that customers valued and purchased services rather than goods, and goods should therefore be viewed as a medium for delivering or 'transmitting' the firm's services. They defined service as 'the application of specialized competences (knowledge and skills) through deeds, processes, and performances for the benefit of another entity or the entity itself'. In this way companies manufacturing cars are not in the business of selling cars but in the business of providing 'mobility services' through the cars that they manufacture – a concept that could apply equally to aero-engines (see Case insight 3.3). Thus, all industries are service industries and it therefore becomes vital for firms to understand the service that consumers are seeking from them. This fundamentally different way of looking at business models questions the dominant logic surrounding any goods. It requires a shift in focus from the product to the **consumer** and a clear understanding of customer needs and how these translate into a service they value and are willing to pay for.

service-dominant logic The implications for the idea that, rather than the product, customers buy the services it delivers

consumer The person or organization consuming or using a product

Radical business model innovation is probably easier (and cheaper) than radical innovation based on new technological developments and can be just as profitable. It involves the ability to question dominant logic and think creatively outside the box, to generate and assimilate new ideas and knowledge, a vision of the future that links opportunities in diverse, fragmented and often geographically widespread markets to the key capabilities of the business. And these skills need to become part of the entrepreneurial architecture of the organization. One of the techniques for investigating the effectiveness of different business models is the Business Model Canvas (Osterwalder and Pigneur, 2010), which we look at in Chapter 12.

CASE INSIGHT 3.4
Swatch

Switzerland

MARKET PARADIGM SHIFT THROUGH DESIGN

Swatch created a whole new market for cheap watches by daring to be different. In the 1980s cheaper watches like those made by Citizen and Seiko competed by using quartz technology to improve accuracy and digital displays to make reading the time easier. The industry competed primarily on price and functional performance.

A selection of Swatch watches on display in an airport in Dubai, United Arab Emirates

Source: iStock/justhavealook

People usually owned just one watch. Swatch set out to change the watch market and make affordable fashion accessories that were also accurate timepieces. To do this they relied upon innovative design.

SMH, the Swiss parent, set up a design studio in Italy whose mission was to combine powerful technology with artwork, brilliant colours and flamboyant designs. For a start, Swatch had to be affordable so costs had to be kept low. Consequently, it was designed with fewer components than most watches. Screws were replaced by plastic moldings. It was made in large volumes in a highly automated factory, enabling labour costs to be driven down to less than 10 per cent of the selling price. Swatch changed the reason for buying a watch from the need to tell the time to the desire to be fashionable. They differentiated themselves not on the function of the timepiece but on its design and also its emotional appeal – a lifestyle image that made a statement about the wearer. In doing this they encouraged repeat purchases because each watch was a different fashion accessory making a different statement about the wearer. Because it was offered at an affordable price, people were encouraged to buy more than one watch. The company used innovative marketing techniques to bring the watch to the market under several different designs. Swatch has built up a core of loyal customers who repeat purchase their watches. New Swatch designs come out every year.

Visit the website: **www.swatch.com**

Questions:

1. How difficult is it to change the way you think about a product or market?
2. What role might design play in this?

CREATIVITY AND INNOVATION

Underpinning innovation is creativity but a prerequisite to all creative processes is knowledge and the openness to different ideas (Simmie, 2002). However, all too often people do not even seek out different ideas, remaining unaware of the information, knowledge and ideas being generated around them. Worse still, they surround

themselves with people who think the same, generating their own dominant logic that is self-reinforcing – a well-known phenomenon on social media known as the 'echo chamber'. Of course, this tendency for like-minded people to cluster around each other is not new. It can have sound commercial reasons, such as the sharing of knowledge and other resources. It is one of the reasons we see clusters of small firms in certain geographic locations. And if these clusters represents outward-looking, creative people, such as Silicon Valley in the USA or Cambridge in the UK, then that creative culture will reinforce itself. Florida (2002; Florida and Tinagli, 2004) argued that some geographic locations (he highlighted cities like London and Barcelona) attract talented, creative people he called 'the new creative class' and these people, in turn, attracted creative, innovative firms. He claimed that rather than people following jobs (see Chapter 1: Geoffrey West, 2015), increasingly jobs will follow people with the appropriate talent, creating a virtuous circle of economic growth. He claimed that the ability to compete and prosper in the new global economy 'increasingly turns on the ability of nations to attract, retain and develop creative people', arguing that this new 'creative class' is drawn to a particular sort of place; 'open, diverse communities where differences are welcome and cultural creativity is easily accessed'. He argued that it is tolerance that attracts the creative class and that they have the talent to develop new technologies. New, technology-based organizations thrive in locations that combine three elements – technology, talent and tolerance.

The point is that ideas that are commonplace for one group can spark insight for another. It is all about being open to ideas from all and every source and not being inward-looking. It is not just about being aware of different approaches or perspectives on a problem, but also about getting the brain to accept that there are different ways of doing things – developing an open and enquiring mind. Large technology companies like Samsung and LG have active programmes to encourage staff to be exposed to ideas from a wide, and sometimes unusual, range of sources. Connectivity, therefore, extends beyond any industry or market context. This is one reason why partnering with other people can be so useful in stimulating innovation. One person exposes the other to different ways of doing things, different ideas, and from this there is the spark of creativity. However, many people almost have to give themselves permission to be creative – to think the unthinkable.

Knowledge and the exposure to different ideas encourage creativity, invention and radical and incremental innovation. 'Connectivity' is one of the key drivers of creativity – the connection we have with a wide range of different people and ideas (Johnson, 2010). This is about not just the scale and range of our network of contacts, but also our ability to spot connections between a problem in one context and a solution to it from another – a topic we shall explore in Chapter 9. Johnson observed that the driver of innovation over time has been the increasing connectivity between different minds. Luck may play a part in all this but, as he said, 'chance favours the connected mind'. He also makes the point that connectivity is not a one-off fix. Connectivity needs to be a continuous process – one that continually creates opportunities for ideas to collide and connect. There is an element of serendipity here – connecting as they do in the right place, and at the right time. This means that regular, frequent opportunities to

connect need to be built into the structure and management of the organization and not just left to chance.

INNOVATION INTENSITY

We have seen how innovation is difficult to define and measure. It can come from changes in products, services, processes and marketing. It moves from radical innovation (including invention and market paradigm shift) through what might be called breakthrough innovations (where there are 'substantial' changes to products or services) to incremental changes. Few companies seem to achieve even 'breakthrough' innovations (Wagner et al., 2014), let alone radical ones. Indeed, there is evidence that the majority of commercially significant innovations are incremental rather than radical (Audretsch, 1995). The reality is that the most commercially successful innovations are really just improvements rather than ground-breaking inventions. Apple's sustained commercial success is based upon good design and improving product ease of use rather than invention. Apple 1 was a big improvement on other computers with its graphic user interface and 'mouse', the iPod was a big improvement on MP3 players, which had been available for years and the iPhone improved on mobile phones from Nokia and Blackberry. Google entered a crowded search engine market then dominated by AltaVista and simply created a better product by using an improved search algorithm. It became commercially successful after it introduced its AdWords bidding system – invented by Idealab. Facebook entered the market well after social networking sites such as Friendster and MySpace.

In 2018 the Boston Consulting Group produced their annual list of the 50 most innovative companies in the world (Table 3.1). The vast majority were based in the USA. The companies were judged on objective financial metrics as well as subjective criteria such as their speed, research and development processes; use of technological platforms; and exploration of adjacent markets based on a survey of 1,500 senior executives. As you can see, many of them have Case insights in this book (those that do are highlighted in bold).

Table 3.1 The world's most innovative companies

	Company	Country		Company	Country
1	**Apple**	USA	11	Airbnb	USA
2	**Alphabet (Google)**	USA	12	SpaceX	USA
3	**Microsoft**	USA	13	Netflix	USA
4	**Amazon**	USA	14	**Tencent**	China
5	Samsung	S. Korea	15	Hewlett-Packard	USA
6	**Tesla**	USA	16	Cisco Systems	USA
7	**IBM**	USA	17	**Toyota**	Japan
8	**Facebook**	USA	18	General Electric	USA
9	Uber	USA	19	Orange	France
10	**Alibaba**	China	20	Marriott	USA

21	Siemens	Germany	36	BMW	Germany
22	Unilever	Holland	37	Nissan	Japan
23	BASF	Germany	38	Pfizer	UK/USA
24	Expedia	USA	39	Time Warner	USA
25	Johnson & Johnson	USA	40	Renault	France
26	JP Morgan Chase	USA	41	3M	USA
27	Bayer	Germany	42	SAP	Germany
28	Dow Chemicals	USA	43	DuPont	USA
29	AT&T	USA	44	Intercontinental Hotels Group	UK
30	Allianz	Germany	45	Disney	USA
31	Intel	USA	46	Huawei	China
32	NTT DoCoMo	Japan	47	Procter & Gamble	USA
33	Daimler	Germany	48	Verizon	USA
34	AXA	France	49	Philips	Holland
35	Adidas	Germany	50	Nestlé	UK/Switzerland

Source: BCG (2018)

The notion that frequent incremental innovations in products, processes and marketing may be just as desirable as infrequent radical innovations brings us back to the question of what entrepreneurial architecture should encourage. And, of course, the answer is that it should encourage all forms of innovation, whether in products, processes or marketing and whether incremental or radical. Using the typology from Figure 2.1, which described entrepreneurship more generally, we might say entrepreneurship should specifically encourage **innovation intensity**, as shown in Figure 3.2a, by pushing this envelope of innovation as far as possible. These are the dimensions and definitions of innovation that Arshi and Burns (2018) used when they found entrepreneurial architecture associated with and antecedent to innovation intensity. They also found each form of innovation was independent of each other.

innovation intensity An increase in both the degree (or scale) and the frequency of innovation within an organization

You might also argue that an entrepreneurial architecture should encourage the speed with which an innovation is developed and brought to the market, so as to capitalize on first-mover advantage. The concept of innovation intensity therefore possibly requires a third dimension, as shown in Figure 3.2b.

A firm can undertake many different forms of innovation simultaneously and it is the innovation outputs, measured in the dimensions shown in Figures 3.2a and b, which reflect the outcomes of an entrepreneurial architecture. Incremental and radical innovations are not mutually exclusive and the entrepreneurial firm can gain competitive advantage from both. Indeed, it has been argued that a track record of successful incremental innovation is a prerequisite of radical innovation (Dunlop-Hinkler et al., 2010). Frequent, small incremental innovations may compensate for the occasional radical innovation or invention and are usually less risky. Furthermore, the sum of many small, incremental innovations can have an enormous impact on competitive advantage (Bessant, 1999). They might even add

up to a revolution. As already mentioned, Henry Ford's revolution in the car industry involved extensive incremental changes – to products and processes, component and factory design and in the way labour was organized in his factories, not to mention his innovative way of selling cars through dealerships (Case insight 10.3).

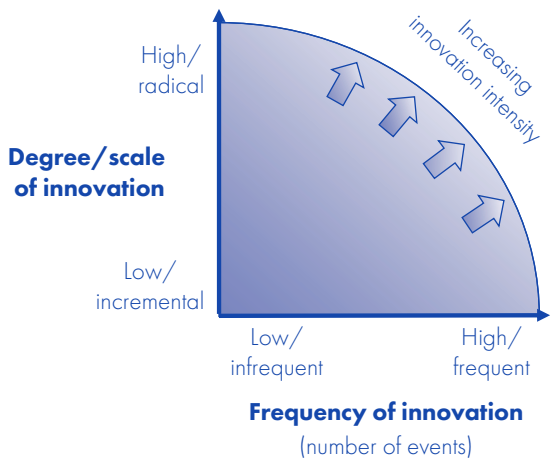

Figure 3.2a Innovation intensity (two dimensions)

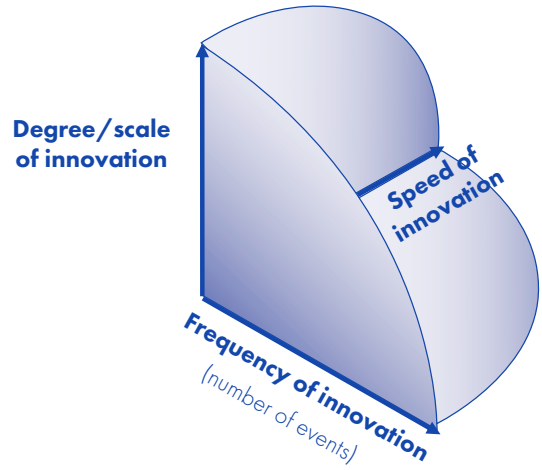

Figure 3.2b Innovation intensity (three dimensions)

INNOVATION AND RISK

The survey by the Boston Consulting Group cited earlier found that many companies were risk-averse and that a risk-averse culture was a major barrier to innovation (BCG, 2018). However, whilst innovation is risky, in today's highly competitive environment not innovating is riskier. Incremental product or service innovation is generally less risky than radical innovation, not least because it builds on established knowledge and an established product or service. Established firms may have years of product or service experience, with established marketing channels and resource capabilities. Product or service innovation generally becomes more difficult the further an organization strays from its core competences. The risks in doing so also increase. Radical innovation might involve new technologies and unknown markets. As you might expect, the risks associated with product or service innovation are lowest for organizations that are good at innovation – practice breeds competence. However, they are also lowest for organizations whose core competences lie in building good customer relationships, often associated with effective branding – allowing for brand extension. The synergy of brand extension creates economies of scope, for example Virgin has successfully extended its brand over a diverse range of products and services from train to airplane transport and from broadband to financial services.

Once innovations start pushing an organization into new, unfamiliar markets, the risks increase. As you might expect, the risks associated with this sort of market extension are lowest for organizations that are good at sales and marketing. However, they can also be lowest for organizations whose core competences lie in the efficiency of their existing

production methods where economies of scale may apply – for example, in the capital goods or extractive industries. So understanding the core competences of an organization is at the base of managing the risks of innovation. The further the organization strays from its core competences, the greater the risk. Figure 3.3 shows risk increasing as the degree of innovation and the unfamiliarity with the market increases. Selling incremental changes in products or services to existing customers should be low risk – the needs of customers should be well known and the organization should have the competences to innovate from its existing product or service base. However, selling radically new products or services into completely new markets involves many unknowns and is high risk.

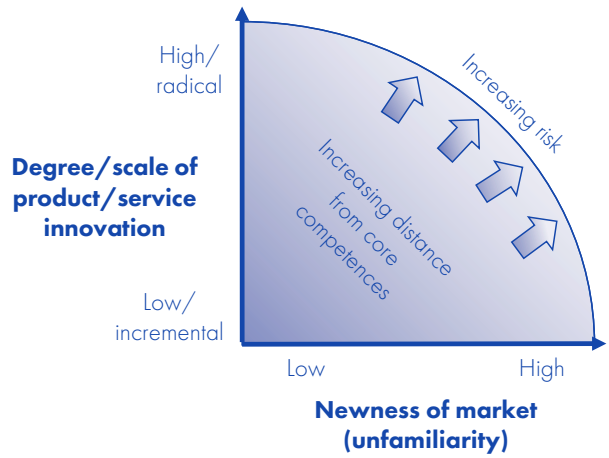

Figure 3.3 Innovation and risk

Most innovations take time to become accepted within a market, following an S-curve of innovation diffusion (see Chapter 14). The pace of diffusion is unpredictable, but is likely to be slower for more radical innovations. Both slow diffusion and rapid diffusion face risk – albeit different sorts. What is more, there are also issues about timing of the launch of an innovation – too early and you risk being ahead of the market; too late and you risk losing first-mover advantage and having many competitors (see Chapter 11).

The rapid pace of technological change today is constantly creating new markets – markets that are global and increasingly interlinked. These are not only attractive commercial opportunities, but also potential threats because a decision not to enter might threaten the organization's existence as these new markets consolidate as they mature. Consequently, high-growth firms are sometimes forced to expand geographically at the same time as their technology is changing – innovating as they enter new markets. For example, the five US internet giants started out offering different products or services: Amazon (internet retailer), Apple (computers), Facebook (social network), Google (internet search) and Microsoft (software). However, through a process of internal development, partnerships and acquisitions they are converging so as to offer a range of similar products and services via the internet. They are fighting to become monopoly providers of all their customers' digital requirements from the best online platform – a kind of digital utility. The more services they offer, the more customers, including advertisers, they seem to attract and the more data it can collect. If this can be done from their own branded hardware with their services wired in all the better. It all creates the opportunity to generate staggering profits (Case insight 15.4).

The keys to dealing with innovation risk are information, knowledge and learning about the products or services you are innovating and the markets you are entering. As we have seen in previous chapters, these are things that the entrepreneur understands very well and an entrepreneurial architecture must facilitate. Developing a set of organization-wide cognitive heuristics to aid risk assessment, information flows and decision-making is an important part of this. And, where knowledge or information is not available within the organization, it must be open to sourcing it from outside. Whilst an organization might understand the product or service it is innovating, it can find out more about the market it is entering by buying-in the knowledge – hiring consultants or recruiting new staff. It might consider partnering with or the acquisition of a firm already established in that market. Even new technologies can be bought-in. It might also consider the possibility of open-source innovation. The organization's network of relationships should also help with this process. Later chapters will demonstrate how innovation risk might be managed as part of an entrepreneurial architecture.

INNOVATION, PROFITABILITY AND GROWTH

Innovation is not usually an end in itself. There are usually other objectives. These may be related to economic, social or environmental outcomes. Numerous academic studies link innovation with competitive advantage. Whilst radical innovation is associated with *substantially superior* competitive advantage (Dunlop-Hinkler et al., 2010), frequent incremental innovation is associated with *sustained* competitive advantage (Avermaete et al., 2003; Dong, 2015; Norman and Verganti, 2014; Salavou, 2002). Of course, the two can be combined, particularly at different stages of a product/service life-cycle. But how do you measure competitive advantage? Is it through superior financial performance such as profitability or growth?

Just as there tends to be a link between risk and return (the higher the one, then the higher the other), you might reasonably expect for there to be a direct link between financial performance and innovation – greater innovation intensity leading to higher profits. You might also reasonably expect there to be a similar link with business growth – high-growth firms are more innovative than others. However, the linkages are not straightforward and finding evidence of a direct relationship between innovation and profitability or business growth is problematic because of both methodological and measurement issues:

- How do you measure innovation? Many studies simply use R&D spend as a proxy. However, there is no guarantee that this results in successful innovation and without that it is just an extra expenditure that will depress profits. For the R&D spend to be effective what is needed is an effective architecture that focuses the area of research and complementary assets that facilitates its commercialization (Freel and Robson, 2004).
- Although innovation is positively associated with growth in employment (Cosh and Hughes, 2007), any link with growth in profits is likely to be 'lagged', with innovation taking time, perhaps years, to feed back into growth in profits – the more radical the innovation, the longer the lag.

- The phenomenon of 'cycling' – the understandable tendency of firms to innovate in one period and then 'consolidate' in the next (Cefis, 2003) – can result in timing confusion. Improved performance might be the result of innovation but be observed and measured in the period of consolidation.
- Finally, there is the question of causation. Even if there were an observable link, it does not necessarily prove causation: 'while small innovators may in aggregate grow faster than non-innovators this is not to suggest that innovation is a necessary, nor less a sufficient condition for growth or superior performance' (Freel, 2000).

So, with these caveats, what does the empirical evidence tell us? McGrath (2001) observed that firms following 'conventional paths' have lower financial returns, while firms taking risks have variable outcomes ranging from medium to high returns and have potential for greater long-term profitability. Other studies have concluded that entrepreneurial risk taking positively influences both financial performance and business growth (Dess et al., 2011; Tang et al., 2014). What is more, radical innovation leads to market domination and firm growth (Atuahene-Gima, 2005; Tellis and Golder, 2002). However, while there is some empirical support for a link between innovation and business growth (Geroski and Machin, 1992; Yasuda, 2005), a number of studies have failed to find any direct *general* relationship (Coad and Rao, 2008; Lööf and Hesshmati, 2006; O'Regan et al., 2006). You might therefore conclude that the evidence linking innovation with financial performance, although intuitively likely, is inconclusive.

INNOVATION, COMPANY SIZE AND INDUSTRY STRUCTURE

Studies of innovation and company size can also appear contradictory. On the face of it, empirical evidence suggests that larger firms are more likely to be innovative than smaller ones. Indeed, EU data (European Union, 2007) showed that larger firms (250+ employees) were more likely to be innovative than smaller firms (10–49 employees). Data from the UK (Robson and Haigh, 2008) showed that larger firms (250+ employees) were more likely to conduct both internal and contracted-out R&D. They were also much more likely to introduce product, process or managerial innovations generally than smaller firms. By way of contrast, the same study showed that sales from new-to-market or new-to-the-business products – disruptive innovations – represent a higher percentage of turnover in smaller firms compared to larger firms. Another study found no difference between the innovative performance of small compared to large companies because, whilst R&D expenditure might be higher in large companies, small companies may have more innovative employees. Studies that use measures such as R&D expenditure or number of R&D employees must be treated with caution because of the inability of small firms often to separate these inputs out. Nevertheless it has been suggested that small firms conduct R&D more efficiently and introduce new products to the marketplace faster than big companies. For example, a US study found that small firms produce 2.4 times as many innovations per employee as large firms (Acs and Audretsch, 1990). Other studies have used measures such as number of patents – an accurate, but limited measure of innovative activity. These appear contradictory because they vary widely across different industry sectors.

Industry structure on the other hand does seem to influence the level of innovation (Santarelli and Piergiovanni, 1996). Studies have concluded that innovation is less likely in more mature industries that are highly concentrated and more likely in new industries that are less concentrated (Acs and Audretsch, 1988; Dolfsma and van der Panne, 2008; Symeonidis, 1996). Large firms are the dominant innovators in mature industries where you might speculate that the focus is on incremental product and cost-reducing process innovations. It is in new, less concentrated industries where small entrepreneurial firms are more important in terms of innovation and where an entrepreneurial architecture can be most advantageous.

Large firms seem to outperform small firms where resources are important – because of capital intensity or because of scale of spending on R&D, advertising, etc. – although there are typically fewer smaller firms in highly capital-intensive industries. Indeed, small firms generally have lower productivity than large firms. However, whereas larger firms have better access to both internal and external financing than smaller ones and are more productive, smaller firms have behavioural advantages – a closeness to the market, a greater willingness to take risks, an ability to act quickly. Nevertheless scale and resource availability matters, no less so than in industries or sectors that are facing disruption through innovation. For example, the retail sector is facing enormous disruption as online retailers compete against high street shops. The biggest disruptor is Amazon – and they spent some $27 billion on R&D in 2018. How many retailers spent anything approaching this? For context, the pharmaceutical multinational GlaxoSmithKline spent about $5.8 billion.

The evidence on the relationship between the size of established firms and innovation is inconclusive (Brynjolfsson and Kahin, 2000). This is despite the fact that large firms have many advantages: such as resources, funding, product and market knowledge and experienced management. So why are they not the main source of innovation? The main reason is probably that they become too focused on their existing products and established markets – making a change in direction more difficult.

What seems clear is that innovative behaviour is not entirely related to firm size. Smaller firms seem to have advantages in some industries, larger firms in others. What we learn from looking at industries rather than just size of companies is that:

- Smaller entrepreneurial firms play a significant role introducing radical, disruptive innovation. They spot the opportunity (perhaps coming out of basic research in the public sector), develop the innovation and move quickly into the market. If larger organizations wish to compete in these industries it requires them to show the same entrepreneurial flair as smaller companies by introducing an entrepreneurial architecture and create the same knowledge networks.
- Larger firms have a significant resource advantage over smaller firms and can be more productive generally. They have more resources of every kind to help with innovation and the costs of obtaining more resources are often lower than for smaller firms. However, smaller firms use the resources they have for innovation more efficiently than larger firms. Larger firms therefore have a potential competitive advantage over smaller firms in areas where the costs of innovation are high, particularly if they can develop an entrepreneurial architecture that enables them to use these resources as efficiently and effectively as smaller competitors.
- Smaller firms thrive in industries where economies of scale are less important to customers than other factors such as marketing, service quality or variety. Whilst

these are often niche markets, they can be highly profitable. If larger organizations wish to compete in these markets they must at least match the factors valued by the target market. One way of doing this is to reorganize into smaller units, each with the entrepreneurial architecture that allows them to compete effectively. Alongside this it may be possible to develop different business models that would be more valued by these target markets, using resources that smaller competitors do not have.

➥ Smaller entrepreneurial firms are less important in stable, mature, high-concentration industries where the innovation focus has switched to efficiency and cost reduction. In these environments an entrepreneurial architecture may be counter-productive. However, by definition, these industries are probably nearing the end of their life-cycle and radical innovation or a move into other sectors is probably required to prolong the life expectancy of the larger organization.

It has been pointed out that the advantages of large firms are generally the disadvantages of small firms, and vice versa, and therefore collaboration or partnering between the two sizes of business can create powerful synergistic relationships (Vossen, 1998). This is a theme we shall return to many times.

CASE INSIGHT 3.5
Astex Therapeutics

UK

SMALL FIRMS AND INNOVATION

Astex Therapeutics was set up in 1999. It was founded by Dr. Harren Jhoti, who left GlaxoWellcome (now GlaxoSmithKline) and by two University of Cambridge professors – Chris Abell and Sir Tom Blundell. Located in Cambridge, UK, the company focused on the discovery and development of drugs, particularly in the area of oncology, using a technique called 'fragment-based drug discovery' – a technique pioneered by the founders and dubbed 'Pyramid'. It was partially seed-funded by the University of Cambridge and raised nearly £100 million of venture capital funds, working in partnership with larger pharma companies to develop a number of new drugs.

In 2011 it merged with a NASDAQ-quoted US company called Supergen, who then closed their US laboratory and concentrated its research in Cambridge, UK, where some 80 people were employed. Astex became a US-quoted company with James Manuso of Supergen as chairman and CEO until 2013, when it was bought by a Japanese pharmaceutical company called Otsuka for approximately $900 million. Its research and headquarters still operates from Cambridge with Harren Jhoti as president and CEO.

Visit the website: **astx.com**

Questions:

1. How important was the link with the University of Cambridge for Astex when it started?
2. In the age of the internet, how important is geographic proximity to sources of knowledge in encouraging innovation? Explain.

SUMMARY

- Innovation is difficult to define. It is about doing things differently. It can take different forms: product, process and/or market innovation. Although scale of innovation is important, competitive advantage can equally be gained by frequent, incremental innovations – a strategy that is less risky and from which the majority of commercially significant innovations have come.
- Innovation intensity is measured by the degree or scale of innovation and its frequency. This measure might be supplemented with the speed taken to innovate. The greater the innovation intensity, the higher the risks faced by an organization (but also the higher the potential profits).
- Invention is the extreme and riskiest form of innovation. Much early-stage innovation is funded by the public sector. But inventors and governments are not necessarily entrepreneurial and they may need the help of an entrepreneur or an entrepreneurial organization to link their invention to market demand and they, in turn, need the backing of financial institutions.
- Business model innovation is about developing innovative plans for how a business competes – plans that break from the dominant logic of a sector. This can lead to market paradigm shift, creating new markets where none existed before.
- Knowledge and the exposure to different ideas encourage creativity, invention and radical and incremental innovation. Connectivity is one of the key drivers of creativity – the connection we have with a wide range of different people and ideas – and this can be encouraged within an organization.
- Finding evidence of a relationship between innovation and business profitability and growth is problematic. The relationship between innovation and other factors is a complex one and therefore studies are inconclusive.
- The rate of innovation (however measured) seems to vary between firms of different size, across industries and sectors depending on industry age and stability, and even location. Small and large firms have advantages in producing different types of innovation. Large firms seem to outperform small firms where access to resources and markets is important. Small firms play a significant role in developing and introducing radical, disruptive innovations. They seem to innovate more efficiently than large firms, although they tend to do this in sectors where resources are less important (where they thrive).

GROUP DISCUSSION QUESTIONS

1. What does innovation mean? Give some examples.
2. How can innovation be measured? Explain how it might be undertaken.
3. What are the differences between creativity, invention and innovation? What are the links between these concepts and entrepreneurship?
4. Which countries are most associated with innovation? Why do you think this is?
5. Is there a best type of innovation?
6. How do you evaluate the commercial potential of a radical innovation?
7. How do you evaluate the commercial potential of a project that involves challenging proven business models that work well?
8. What are the risks associated with innovation?
9. What are the risks associated with market paradigm shift?

10. Is frequent incremental innovation better than infrequent radical innovation?
11. Why might large companies decide not to exploit innovations developed by others that affect their markets?
12. What are the challenges facing an organization seeking to become 'ambidextrous'?
13. If innovation is risky, then you need to take time to introduce it. Discuss.
14. What are the problems in linking innovation with profitability and growth?
15. What advantages and disadvantages do small firms have over large firms in innovation?
16. Why and how does scale influence innovation?
17. Why and how does sector influence innovation?
18. What does innovation mean for a social enterprise?

ACTIVITIES

1. Draw up a research proposal to measure innovations undertaken in an organization in the last year. Make sure you cover details of the measurement scale you propose to use (e.g., a copy of the questionnaire) and the methodology you would use to collect the data.
2. Find an organization that has introduced innovations over the last year and undertake this study, plotting your results on a diagram such as Figure 3.2(a) or (b).
3. Write a report explaining the commercial disruption caused by the internet and mobile technologies over the last decade.

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