# THE BUSINESS
## *of* INNOVATION

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# INNOVATIVE PEOPLE

# 7

## SCOPE AND OBJECTIVES

- People as innovators.
- The human capital factor.
- Characteristics of creativity, higher levels of skills and competencies, the talent quotient.
- Individuals and teams.
- Sources of creativity.
- Leadership that galvanises innovative people.

## INTRODUCTION

The basic premise of this book indicates that all three factors that contribute to innovation, namely innovative people, the innovative organisation and the innovative environment, are inextricably connected to each other. The difficulty lies in separating them and their influence over or co-relationship with each other. However, it is this problem that demands a separate understanding of each of these factors if only to consider a synthesis at the end. In this chapter we examine innovative people.

To refer to innovative people as innovators causes a degree of confusion. Innovators include organisations as well as individual people, and in common parlance creative organisations generating new products and services are often referred to as innovators. This is one of the reasons why people do not receive much attention in typical textbooks on innovation. Entrepreneurs have a better press, at least in terms of their roles in identifying opportunity and creating new firms. At best innovators are often confused with white-coat-wearing scientists, techno-babbling nerds, or Steve Jobs. But Jobs was also seen as an entrepreneur! So is the innovator also an entrepreneur?

### INNOVATIVE PEOPLE, ENTREPRENEURS AND THE DISTINCTION BETWEEN ENTREPRENEURSHIP AND INNOVATION

Before it all starts becoming even more confusing, it is perhaps important to posit simple explanations that help to distinguish entrepreneurship and innovation. If by innovation we mean the development of new products, new services, new forms of organization and new business models, then we could argue that entrepreneurship is associated with the identification of opportunities for all these new forms and their value in the marketplace or in society. Add to that the necessary mobilisation of resources (including firm creation) to implement such value creation, and we have a measure of the difference between the two concepts. This explanation helps to distinguish between entrepreneurship and innovation which are often viewed synonymously, as in Shane and Venkataraman's definition of entrepreneurship as the study of

> how, by whom and with what consequences opportunities to produce future goods and services are discovered, evaluated and exploited. (2000: 218)

The distinctiveness is afforded by the acknowledgement of an organisational component, namely the formation of new organisations. It is this organisational context that distinguishes innovation from entrepreneurship (Acs and Audretsch, 2005). So it could be argued that the innovator creates new, out-of-the-box ideas, products or processes while the entrepreneur spots the commercial opportunity to take them to the market by organising resources and taking risks to start and grow an enterprise. Just as the risk taker could be both the creator of a new product and the resource provider to enable the product to be taken to the marketplace, the qualities of the entrepreneur and the innovator can also be found in one person. Argued another way, innovation can be regarded as the creation of new capacities for wealth creation, while entrepreneurship is the exploitation of these capacities using the vehicle of a new organisation. The convergence of these qualities may be afforded by separate people, or can occur at different intervals during a person's journey through life in business or social activity. Others argue that innovation creates change, but this can be outside the realm of business creation or new firm formation. Here innovation manifests itself in terms of activity which can cause a change to society, but this action may have nothing to do with starting or growing a business. A politician, such as the first Prime Minister of Israel, Ben Gurion, realising the need for change in a nation besieged by both an inclement natural and a hostile political environment, sought self-sufficiency and political strength through a reliance on technological innovations and economic strength. He too was an innovator (Senor and Singer, 2009; Mitra, 2012).

Although we can make these distinctions between the entrepreneur and the innovator, they quite often end up in a restatement of the connection between the two or the equation of concepts with many other issues. For example, there is a generally held belief that entrepreneurship is associated with any business activity and often with self-employment. In this melee there is not much room for analytical thought. So it may be better to overcome this problem of articulating the difference by accepting that the lines are blurred, and that there is not much gain to be had from making

any distinction between the two. Alternatively, and perhaps more importantly, it may be useful to strip away the multiple associations of entrepreneurship with any business activity and focus instead on entrepreneurship as the necessary corollary to innovation. Fortunately, there is help at hand with Schumpeter (1942), who equated entrepreneurship with the concept of innovation and applied it to a business context. In his view the entrepreneur is the same as the innovator because he or she enables and implements change within markets through the carrying out of new combinations. These new combinations can take at least five different forms: (1) the introduction of a new good or an improvement in its quality; (2) the introduction of a new method of production; (3) the finding or opening of a new market; (4) the conquest of a new source of supply of new materials or parts; and (5) the carrying out of the new organisation of any industry (Schumpeter, 1942).

Schumpeter's definition allows us to concentrate attention on the process of making new combinations – from the making of a new good to the building of a new organisation. Taken together, the several forms can involve many different people with perhaps different entrepreneurial and innovative attributes. Looking at the forms independently, we can also surmise that each of those processes can involve a variety of individuals. The literature on entrepreneurship covers a range of psychological and behavioural characteristics of entrepreneurs who are sometimes identified as innovators or craft workers or even business managers. Sometimes these characteristics are often traced to innovators as well.

For the purpose of this chapter we take the view that the business of innovation is best understood when we can find market-based outcomes for new products, new services and new ways of creating and managing organisations. In other words, the business of innovation is carried out in the field of entrepreneurship. So even if there is a distinction to be drawn between the capacities necessary for making or serving something new in the market and the exploitation of those capacities, there is a symbiotic connection between the two. From an analytical perspective we concern ourselves here with the new or recombined capacities that help to create new products, services, business models and organisations. Inherent in this approach is the identification and use of different forms of human, social and organisational capital that reside within a number of individuals who are sometimes connected with each other as part of a team of innovators.

## *CAPACITY DEVELOPMENT AND INNOVATION*

Accepting the relationship between innovation and entrepreneurship but distinguishing between developing capacities for making something new and exploiting those capacities, we concentrate in this chapter on capacities. Capacities can include a range of tangible and intangible, human and technological resources, and hard and soft infrastructure. Our interest here is in the human factor in capacity building. We explore the role of human capital in fostering innovation – talent, creativity, ingenuity and teams of innovators – together with the analytical distinctions between different forms of human, social, organisational and intellectual capital that are often regarded as central to the innovation process.

# HUMAN CAPITAL AND INNOVATION

## *KNOWLEDGE, EXPERIENCE AND SKILLS*

By human capital we are referring to a set of knowledge, capabilities, skills, competencies and expertise that people possess and which can be developed or improved over time. The use of these skills and the knowledge base of individuals could generate economic returns (Schultz, 1961; Becker, 1964; 1993). This set can be acquired through formal education and informal means of experiential, societal learning. Becker (1964) argued that the levels of human capital and their mutation can change the way people act (Gradstein and Justman, 2000). Both broad labour market experience and vocational experience, used productively, can be a source of competitive advantage to individuals, organisations, economies and societies (Coleman, 1988; Honig, 1996; Gimeno et al., 1997; Reynolds, 1997; Zucker et al., 1998; Reynolds et al., 1999; Acs and Armington, 2004; Abubakar and Mitra, 2007; Mitra et al., 2011). This can take place in terms of, for example, growth in regional economies through new firm formation or indeed their dissolution (because of a lack of such capital); in businesses, through new products and services; and for individuals, through enhanced capacity for effecting change in their lives (Pennings et al., 1998).

The link between human capital and innovative outcomes can be examined at the level of the individual, the firm and the industry, so it is important to distinguish how human capital is interpreted at these different levels.

## *FIRM-SPECIFIC HUMAN CAPITAL*

When we refer to firm-level human capital we are attending to skills and knowledge that are obtained in a specific firm. These firm-specific skills can confer an advantage over competitors because they are inimitable or non-transferable (Penrose, 1956; Grant, 1996). Firms nurture the skills of their employees or have high levels of absorptive capacity (Cohen and Levinthal, 1990) to acquire skills and knowledge from outside, but their firm-specific boundaries mean that they can have only a limited amount of impact on overall innovative activity within a region or the wider society.

## *INDUSTRY-SPECIFIC HUMAN CAPITAL*

Industry-specific human capital is associated with the aggregate skills of all firms in a particular industrial sector. These skill sets have a shared meaning, often evolving from tacit know-how within the sector which may or may not be transferable to other sectors. Researchers have argued that the knowledge created and shared from experience within an industry can have an impact on the creation of new ventures or the growth and improved economic performance of innovative firms which are able to absorb knowledge generated across that industry (Siegel et al., 1993; Kenney and von Burg, 1999; Bianchi, 2001). Saxenian (1999) argued that the success of Silicon Valley is partly related to the presence of an intensive flow of tacit know-how among local firms and a culture directed at open communication, which ultimately resulted

in a steady process of incremental knowledge development within that region. The problems facing the Route 128 area, however, may be explained by a local culture of secrecy and limited inter-firm cooperation.

### INDIVIDUAL-SPECIFIC HUMAN CAPITAL

Individual-specific human capital refers to knowledge that is applicable to a broad range of firms and industries; it includes general managerial and entrepreneurial experience (e.g. Pennings et al., 1998), the level of academic education and vocational training (Hinz and Jungbauer-Gans, 1999).

We focus here on human capital that pertains to an individual or teams of individuals.

Becker's (1964) idea of the transformational value of human capital can be linked to Bourdieu's (1983) theory of 'conversions', which posits the argument that various forms of capital can be converted into resources and other economic dividends. A kind of linear argument promotes the idea that the more educated a person is, the more time, energy and money they spend in improving their knowledge or skill sets and the more equipped they are to derive increased benefits for themselves. But does that make people innovative? If conversion of a basic stock of knowledge and skills is to take place, is there any necessary correlation between an innovative outcome and the development of capability or the pursuit of a specific activity?

If we regard innovation as a knowledge-intensive activity, then what we mean is either the creation of new knowledge for economic or social benefit, or the combination of existing bodies of knowledge for similar outcomes. These outcomes are measured in terms of increased productivity or heightened competitiveness. What researchers argue is that on-the-job training and education and continuing investment in such activities help to increase productivity at the organisational or societal level and higher intellectual capacity at the individual level (Black and Lynch, 1996; Cannon, 2000). Overall growth in both individual intellectual capabilities and economic terms drives the need for new products, new processes and new forms of organisations.

Knowledge-intensive activity enables people to adapt to, integrate with and make sense of new situations (Weick, 1996). As we have argued elsewhere, both explicit and tacit knowledge (often referred to as uncodified, know-what) or explicit knowledge (codified in procedures, formal manuals and written documents, formal education) as explained by Polanyi (1967) are integral parts of knowledge-intensive activity which include complex problem solving and creative decision making. Embedded as they are in social structures and belief systems, these activities have the highest impact in the situations and locations where they are carried out, with the knowledge spill-over effect either consolidating such knowledge locally or transferring it elsewhere. Both are theoretically predicted to increase human capital. Previous knowledge and previous entrepreneurial experience are significantly related to innovative or entrepreneurial activity, particularly when controlling for factors such as industry and gender (Robinson and Sexton, 1994; Bates, 1995; Gimeno et al., 1997).

The apparent positive relationship between human capital and innovative activity is, however, undermined by conflicting results from various empirical studies. Gimeno et al. (1997) found that human capital can increase performance, but not persistence. Moreover, it is likely that different types of human capital may

be necessary at different stages in the innovation process or for varied types of innovation. R&D for example may require higher levels of education, while the implementation of a specific process in new product development may require high levels of experiential know-how. Similarly, incremental innovation may depend more on work experience, while radical innovation is best found from scientific or technological experimentation first in research laboratories.

### WEAKNESSES IN THE TRADITIONAL ARGUMENTS ABOUT THE LINKS BETWEEN HUMAN CAPITAL AND INNOVATION

There are a number of other weaknesses with the argument of accumulation of individual human capital and their implications for innovation.

First, even if we were to acknowledge the view that more human capital is generally always better, social structures and systems might bias individuals either to invest excessively or to under-invest in such capital. The notion of carrying an undergraduate degree loan over one's lifetime may discourage the relatively poorer section of communities in the UK to consider alternatives to higher education if they were available. How much and when they invest in such capital may influence life career choices, including attitudes towards both entrepreneurial activity and innovation in different ways. There are, for example, many arguments about over-investment in higher education, discouraging risk taking among graduates (Davidsson and Honig, 2003).

Second, ignoring the social structures of organisations and social networks reduces our understanding of factors impacting on human capital outcomes. Although a high proportion of knowledge and skills required for innovation may reside with individuals, most modern innovations are complex. These modern innovations demand a combination and integration of multiple strands of this knowledge and skills. The conception of a new idea may well be an individual activity, but developing, testing, market search, implementation and evaluation are a collective achievement (Van de Ven, 1986; Hill et al., 2014; Isaacson, 2014). Within organisations, structures, systems and routines are created to accumulate individual knowledge for collective current and future use, create new product development teams and formal product development processes, facilitate communication, group formation and interactions that can streamline individual contributions and convert them into flowing streams of innovative outputs and outcomes (Cooper, 2001). See Chapters 5 and 6 on innovative organisations for details of how these processes work within an organisation.

Third, human capital is an aggregate measure which counts the stock of skills, qualifications and knowledge of a body of people within an organisation. Aggregate measures are useful for economists, but there is an unfortunate outcome in looking at the talent and ingenuity of people in terms of a commodity that can simply be bought and sold in the market or added or reduced in an organisation to secure profits. Fortunately, good research on human capital does not fall into this trap. What we need to understand is:

- the huge variety of people who make up such a stock, and their mindsets, attitudes and capabilities; and
- how these different capabilities and mindsets are harnessed by organisations and their leadership so that people are then willing and able to innovate when brought together to facilitate innovation. (Hill et al., 2014)

## CAPABILITIES AND MINDSETS FOR INNOVATION

Let us look at mindsets and capabilities first. These are often associated with leaders who pioneer or enable innovation or with entrepreneurs who implement the innovations in the market. But this need not be the case. It is often the coming together of disparate competencies in different types of networks that makes for innovation. Leadership may of course bind these competencies together, and take it down a particular route to market.

At one end there is this notion of a 'higher set' of attitudes and motivation of people who translate intentions into results. We sometimes find examples of these 'heroes' in glitzy, 'how to do it' airport books on management practice, but also in more reasoned, research-based volumes such as Narang and Deviah's *Orbit-Shifting Innovation* (2014). As opposed to linear-mode thinking for creating, for example yet another 'app', orbit-shifting innovators identify a need to create something new and not follow history. The breakthrough that is achieved has a transformative impact on organisations, the economy and wider society. Tim Berners-Lee with his World Wide Web can be regarded as one such pioneer.

Using the planetary metaphor of gravity and orbits, Narang and Deviah explore both the impediments of culture (the 'cultural gravity' of arrogance or subservience) and the enabling factors of, for example, lateral thinking in a range of cases from cataract surgery to TV quiz shows, and cultural backdrops ranging from Korea to India. They begin by challenging the barriers that hold them and others back instead of accepting or living with the situation. In other words, they confront some manufactured gravitational pull that can hold innovations back – mindset gravity, organisation gravity, industry gravity, country gravity and cultural gravity. They identify six characteristics of 'orbit-shifting' innovation:

1. An ability to seek personal growth which is the motivation for taking up a challenge. Here it is the *size of the challenge*, not the size of the organisation or the monetary reward, but rather the difference (the 'size of the difference') it can make which is more appealing. In taking up such a challenge they are keen to move out of their comfort zone and into realms of uncertainty and the unknown.

2. The change and adoption of the *new direction* necessary for making a difference becomes the challenge and not necessarily the final destination. Stepping into the unknown does not promise definable outcomes. The mechanics, the instruments and the process of transformation are seen as more attractive for innovators than a performance goal or the metrics associated with the goal. These characteristics may be shared with many others in the business of creative activity, including academic researchers. The latter group is less concerned, for example, with the impact of their research, and is perhaps motivated more by the process of enquiry. However, innovators differ from researchers in that they do want to see an impact – technological, economic and social – which changes the way we think, do and create new openings. Unlike status quo maintenance managers, they are less interested in protecting legacies and more attracted to legacy creation. They ignore failures and are constantly looking at the progress made. They treat innovations reviews like performance reviews.

3. Seeking challenges and new directions is necessarily accompanied by a discovery-oriented mindset characterised by *fresh insights that emanate from a desire to ask questions*, but not always answers. In doing so these innovators move away from doing the same and seeking the immediate legitimacy of their peers (unlike academic researchers!). They are convinced by their art of finding value in every experience, and in every conversation. Possibilities of what could happen are a better proposition than the use of prescriptions to determine outcomes.

4. *Collaborating with stakeholders* is the key to their search for new possibilities. This is different from simply making a pitch to funders and marketing to consumers. These stakeholders are connected to the vision and realities of work of the innovator, often as end users, crowdsourced idea generators or problem solvers. As a result the stakeholders often adopt, co-own and extend the idea, the product or the service. Collaborating often involves dissent, and overcoming this through shared problem-solving platforms while synthesising different approaches forms part of the search for new directions.

5. The use of a *non-linear approach*, that is identifying the problem first rather than their individual capabilities, helps innovators to convert problems to opportunities. The ideas stem from the identification of the problem, and in asking 'what-else?' questions they allow for the original idea sometimes to grow bigger than the initial concept.

6. They combine their romantic visions for change with *realism in execution* by seeking challenges and new directions, collaborating with stakeholders and dealing with problems. They may be self-efficacious but the efficacy is evinced later in the outcomes. Non-innovators are perhaps more realistic about the vision and hence easy buyers of the idea of what cannot be done, let alone be executed.

Let us look at an example.

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### VIGNETTE 7.1    EXCEPTIONAL PASSION, TALENT AND TECHNOLOGY

#### INTRODUCTION

Nkosinathi Maphumulo (NM) dreamt about being a DJ in South Africa. He used to sketch Technics SI-1200 turntables as a child. But this dream was nearly shattered at a time when his country was participating in a bigger dream about the future with the release of Nelson Mandela from prison in 1990. On the very day (11 February) that Mandela was released, crowd violence in NM's own town in Durban led to the dislocation of this 14-year-old boy's shoulder very badly. The doctors had even considered amputation.

## A BIO SKETCH

Born on 11 March 1976 in Durban in KwaZulu-Natal Province, NM is now a South African multi-award-winning record producer and DJ. He commenced his music career back in 1994 and has released four albums and one live DVD using his Johannesburg-based record label, Soulistic Music. NM majored in Jazz Studies at Technikon Nata, and then worked as a backup singer for Madala Kunene together with his two school-mates, Mnqobi Mdabe (Shota) and Thandukwazi Sikhosana (Demor). The three of them formed an Afro-pop trio called SHANA, short for 'Simply Hot And Naturally African', and were signed under Melt 2000, then headed by Robert Trunz. By 2007, as 'Black Coffee' NM had become a household name in the country's DJ scene, as he both fired up and seduced audiences with his tribally infectious, vocal-laced beats. In the same year he released his second studio album titled *Have Another One*, which topped local charts. Now at 39 he is a flourishing DJ/producer! He is probably one of the most influential musicians on the African continent after having obtained his big break soon after being chosen as a participant for his country in the 2004 Red Bull Music Academy held in Cape Town. In September 2015 he was selected as the 'Breakthrough DJ Of The Year' on Awards at Ibiza, only a little over 2 weeks after his latest album, *Pieces Of Me*, was released. The main instruments in his repertoire are vocals, keyboards, sampler, percussion and a synthesiser.

## EMBRACING TECHNOLOGY, OVERCOMING ADVERSITY

Where and how did it all begin for a young man who suffered such a shattering injury? NM ignored his physio's advice and taught himself how to use the music production software Cakewalk, and managed to get his dream turntables at the age of 22. What appeared to constrain him were the doubts about his mainly disabled and immobile left arm. He would worry about carrying a crate of records, taking a record out with one hand, playing it and then returning it into its cover. This is where his awareness and adoption of modern technology came to the rescue.

## THE INNOVATION

NM uses a custom rig with bespoke Pioneer 350-CDJs, including USB sticks, to ena-ble him to do the mixing with one hand while he puts the hand of his damaged left arm in his pocket. With technology at his disposal NM makes 'soulful live instrumentation with Logic-created rhythms'. This is 'Black Coffee' music, with NM producing his new album for the influential dance label, 'Ultra'. Alongside his music production NM has also a created retail app for South African music called 'GongBox', motivated by the need to fill a gap in the market for South African music. As he states, 'You can't find South African music anywhere online. I couldn't even find my debut album there!'.

## FUTURE DIRECTIONS

Where can Black Coffee go in the future? Would he be South Africa's answer to Spotify or even Apple? This will be his challenge, as will the need to persuade an emerging

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Internet country to buy MP3s. It seems NM's evolution as a music-producing, high-tech entrepreneur has its own riff in Mandela's comment: 'It always seems impossible until it's done!'
    Quote from Red Bull Studios:

    Considering his meteoric rise to fame, it would be easy to stereotype Black Coffee as just another black diamond, a BEE beat magnet out to mine the insatiable upwardly mobile urban house-party market. But as he proved on his South African Music Award-winning album Home Brewed, this DJ and producer defies convention. Sidestepping Afro-house clichés and stage-managed highs in favour of restrained sophistication, Black Coffee's penchant is for true Afropolitan house: home-brewed but trendsetting, fashion-conscious and future-focused. Expect almost sculptural balance and beauty'. (www.redbull studios.com)

*Source*: Morris (2015)

For Maphumulo, a passion for playing and making music as a DJ was the challenge, especially when we factor in the disability that he suffered from his accident at a time of high euphoria in his country. Instead of succumbing to his disability he asks 'what else?' and collaborates with the technology providers, and social media, not only to produce his music, but crucially to put exciting new music on the new media map. Not only does he take new directions in terms of technology, but he uses the technology to extend the music platform (the app) and to challenge potentially the big label global incumbents by providing a platform for African dance music. This is not simply a story of overcoming disability, but one of creating music in a new form using relevant new technology. The Mandela quote probably sums up best the arguments used by Narang and Deviah (2014).

What is being referred to above is not limited to individual capability or a flash of genius. The set of six behavioural characteristics is a complex compendium of attitudes, behaviour and action. We can see this being manifest in the solo efforts of an individual innovator such as Maphumulo and also in larger creative organisations.

Maphumulo's story illustrates an unusual capacity to fight the odds as an individual and to achieve the heights of excellence not seen in common situations. In adapting himself to his circumstances he takes a non-linear approach, defying expectations of limitations traditionally associated with disability. His dreams may be part of his romantic vision, but a focused realism of execution can be found in both his dedication to his muse and to the effective way he sets about organising a music label and working towards cultivating a digital music community in South Africa.

Maphumulo's innovation narrative may reflect best the realisation of the creative abilities of an individual. In organisations, especially in larger firms, routines and

established modes of conduct may not have room for the flowering of such talent. But then this view precludes organisations from building on and harnessing talent. If we assume that organisations can be innovative, then part of that identity is derived from the roles individuals play in those organisational arenas individually and as a collective. So let us see if we can find the mix of creative capabilities in an organisational setting, where individually carrying people both inside (fellow workers) and outside (customers, suppliers distributors, partners) the organisation is part of the creative process making innovation come alive. How does the innovative person navigate his or her way through set structures, routines, the rigours of quarterly returns and other constraints?

## VIGNETTE 7.2   GAMING AND THE REAL, INNOVATIVE MASTER CHIEF

### INTRODUCTION

Take Bonnie Ross, a 48-year-old woman in charge of Microsoft's gaming franchise, *Halo 5: Guardians*, considered to be one of the biggest game releases of 2015. She runs a studio within Microsoft, called 343 Industries, where she manages 600 staff and oversees a budget of more than $100 million for *Halo 5* alone. In *Halo 5*, Microsoft is betting on a comeback in games and recouping the investment it made in the Xbox One which never quite caught up with Sony's PlayStation 4. Both the Halo and the Xbox emerged in 2001 with the former being responsible for Xbox's survival, according to Microsoft executives.

Microsoft has licensed the Halo name to a wide range of products, from special editions of Monopoly to a full body armour suit (that sold for $450), and even a novel entitled *Halo: The Fall of Reach* which was published before the first game was available on the market. Over the past 14 years consumers have spent $4.6 billion on these Halo products, about 25% of them on non-game merchandise.

### BIO SKETCH

Bonnie Ross arrived in the video games business by chance. Having given up her interest in volleyball because her father wanted her to something 'useful', she studied technical communications and computer science at Colorado State University in the USA. During this time she acquired an internship at IBM, and on graduating applied for jobs at three major organisations, of which NeXT and Apple did not respond. Microsoft did, and in 1989 Ross started work there, but quickly lost interest in drafting manuals to forage instead with a team developing a basketball game for Microsoft's early-stage game business. Her knowledge of sports was probably the motivation and the draw for this involvement and indulgence in creative work. Her first titles were developed for the PC and then the Xbox, and included a portfolio of games called *Fusion Frenzy* that debuted with the original Xbox console. Having managed a number of games after that, Ross eventually chose to focus on Halo in 2007.

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## OVERCOMING STEREOTYPES AND CONSTRAINTS

At the time of Ross's entry into the world of Halo, most of her colleagues were not entirely comfortable with Halo, thinking it was the end of the franchise and worrying about whether she had taken the right decision for a young person with considerable future career prospects. Could this reservation have been anything to do with stereotypical assumptions about the occupations and ambitions of women? Ross stuck to it and demonstrated a determination to make things work. 'The thing I asked for was: If I take it over, I want to be George Luca. I want to know everything, and I want to do things differently', Ross reflected during an interview with *Bloomberg*.

## THE INNOVATION

The studio that created Halo in 2000 was called Bungie. Creative tensions led to this studio being spun out of Microsoft, but the latter held onto Halo and formed 343 studios to run it instead. The creative 'deserters' in Bungie did not quite give up and have gone on to make the video game *Destiny*, which is one of Halo's key competitors. The world of video games, with its stereotypical anti-establishment and non-corporatist approach to work, assumed that the large corporate culture of Microsoft would kill Halo. When a guy called O'Connor who had moved to Bungie helped Microsoft with the transition, he was surprised at Ross's depth and breadth of knowledge of the narrative of the fiction and the games. Indeed, O'Connor left Bungie and returned to Microsoft to work with Ross in the new studio which was named after a deadly piece of artificial intelligence that appears in many Halo games.

The team started a new lease of life in what was previously a hardware store in Kirkland, a suburb of Seattle and near to Microsoft's headquarters at Redmond. The team believe in the building which they consider to be just about perfect for their work, especially the coding in an open floor plan but with little natural light. Ross makes a telling comment about how the ambience is conducive to creative team work: 'During game development you can feel the pulse. You can walk in and tell if we're off or not, and whether morale is up or down, because we all act as one.' While the headquarters has room for about 230 people only, the rest of 343's employees operate from another building down the block. The full roster of people at 343 includes computer programmers or designers, cloud computing experts, a professional team of competitive game players, and a psychologist who works with user interfaces. A group of people are dedicated to sound only because most of the noises are customised for the game. Typically, these sound engineers are known to have gone to a gun range in California to record bullets whistling past their ears! A visit to a concert hall in Prague was made with the intention of obtaining a proper angelic chorus for the 'big moments', and a hot spring in Iceland provided the right kind of extraterrestrial ambient sounds.

Ross's attention to detail is well captured by the *Bloomberg* interviewer. He refers to her meetings with the consumer-products team and the way she makes choices about materials and products that are outside her direct interest in gaming, especially when she seeks reassurance about possible manufacturing shortages. Ross is a rare species, a woman in the games industry, which is dominated by men. Internet trolls routinely and mercilessly harass women in the industry. She feels that her job is to

remind her colleagues that girls also play video games, and she has insisted that the fully formed female characters play prominent roles in *Halo 5*. Equally, she has ensured that the Halo T-shirts are made in cuts for women too.

One constant feature of Ross's style of working on constant innovation practice is to confer openly and readily with equal partners in their specific areas of excellence. Interacting with colleagues like O'Connor, who runs Halo's fiction business, enables her to understand better the connections between content (the story) with the spin-off game and the iPhone app that followed. While O'Connor suggests that there may not be much to worry about in respect of mainstream acceptance of the 'novelistic stylings' in a multibillion-dollar product, Ross acknowledges the value that lies in creating greater awareness of the game which she likens to 'world-building'. Then there are the regular tests and experiments with the creative director and the involvement of guest players. As a sports fan, Ross has given the Seattle Seahawks an open invitation to come and engage in multiplayer combat with her in-house team of gamers. Multiplayer gaming and getting it right are considered essential for 343.

In November 2014, *Halo: Master Chief Collection* was released. Making available a single disc for the new console with remastered versions of the first four games was a smart way to allow fans to play on the new Xbox while generating more revenue from the old games. Routine interactions and taking the games to be tested in employees' homes also allow Ross and her team to work out why simple mistakes occur, such as scheduling a time for people to log in when there is football on TV. This is where Ross as both a gamer and a sports fan trumps the 'nerdy' preoccupations of gamers. Being aware of the world in which consumers will use the innovation that is launched is as important as the fine tuning of the technical and financial aspects of the product.

### REFLECTIONS

Each Halo launch has been larger than before but there are now fewer Xbox ones. This compares with more Xbox 360s when *Halo 4* was released onto the market. So this could potentially reduce sales, something which makes Ross and her executives not too confident about the strength of *Halo 5*. Perhaps Microsoft has waited too long to develop and launch it.

*Source*: Adapted from *Bloomberg* (2015)

Bonnie Ross's Microsoft journey shows us that creative talent can be nurtured in larger organisations too. Here, the effort that is made to secure innovative outcomes centres around the coalescence of multiple levels of expertise, a willingness to learn from others, and a strong motivation for connecting one's goals and objectives with the capabilities of various others in the organisation. We can reflect on Bonnie Ross and find in her career path how innovative people find expression of their strong personal interest by marrying a set of key capabilities with the environment in which they deploy them. A strong sense of new directions for the Xbox, especially under highly competitive circumstances, is based on an equally strong desire for personal growth and mixed with a good understanding of collaborative work with key internal stakeholders and prospective customers. A commitment to realism in execution is

also seen in the various ways in which she tests the new game to ensure that it plays out best for Microsoft's future in this sector.

We can reconfigure the set of six behavioural characteristics of Narang and Deviah (2014) in terms of generic skills and attributes that underpin innovative behaviour, which are drawn from the literature on trait theories (supporting the idea of what comes from within us) and social cognitive approaches (focusing on behaviour and attitudes and emphasising what can be learnt).

## SKILLS AND ATTRIBUTES

In developing a tool – the Youth Innovation Skills Measurement Tool – for NESTA in the UK, Chell and Athayde (2009) refer to five generic skills underpinning innovative behaviour. These include:

(a)  'creativity (imagination, connecting ideas, tackling and solving problems, curiosity);
(b)  self-efficacy (self-belief, self-assurance, self-awareness, feelings of empowerment, social confidence);
(c)  energy (drive, enthusiasm, motivation, hard work, persistence and commitment);
(d)  risk propensity ( a combination of risk tolerance and the ability to take calculated risks); and
(e)  leadership (vision and the ability to mobilise commitment).

Interestingly, many of these attributes are also found among entrepreneurs, lending credence to the confusion between entrepreneurship and innovation which we reflected upon at the beginning of this chapter. What is missing from this list is opportunity identification and resolution and the mobilising of resources, as distinctive attributes of an entrepreneur, which if added to the list above could potentially exacerbate the confusion.

In examining attributes and characteristics, trait theorists may concede the view that people are not necessarily born with specific skills. They do, however, assume that attitudes, aptitudes, abilities and behaviour are formed early in life and stay with people because personality is a fairly stable variable and also because interactions between genetic make-up and experience occur early on in life Thus innovators are born and we cannot increase the supply of innovators artificially. Judging by the fact that major, radical, orbit-shifting innovations do not occur every day or regularly, one may be inclined to endorse the born-innovator concept. But then what innovations are we referring to and why do we assume that radical innovations are the only source of transformation in societies? Is all behaviour neutral and do environmental conditions or political factors affect what we innovate and where? Radical innovations do not fall like manna from heaven, but are often the unseen, breakthrough outcomes after many years of accumulated incremental innovation. As Pringle (2013) notes, human creativity 'simmered for hundreds of years before reaching a boil'.

The idea of accumulated creativity and innovation, the different forms of innovation emerging at different times, suggests that the human endeavour necessary to make innovation work has a social function.

# SOCIALISING HUMAN CAPITAL

Social factors underpinning human, innovative endeavour include beliefs, attitudes, values and skills. They are influenced by social interactions among people and in or across cultures, in various institutions that stretch from the temple to the neighbourhood club. If interactions lead to a change of behaviour as a result of the influence then that means that a certain amount of learning takes place. Bandura (1986) refers to this form of learning as 'social learning' which, as Chell and Athayade (2009) state, matches the set of evolving attitudes and values with behaviour and goals. The lack of such a match results in cognitive dissonance (Festinger, 1957). But can we expect consistency in matching behaviour and beliefs or could cognitive dissonance allow for new creative tensions as beliefs get ruptured or behaviour deviates from the norm? Whichever way we look at these issues we find that innovative behaviour that leads to economic and social development is informed by a cognitive process, based on the experience and ability of creative people to use their ideas, knowledge and skills to develop something new or novel of value to themselves and, crucially, others.

In both the cases discussed so far, the navigation of the contexts and the environment in which innovative people find themselves is perhaps the overriding skill which draws on creativity, energy, risk taking and the other attributes listed above. It would be erroneous to suggest that either Maphumulo or Ross necessarily operated in the most conducive environments. In both cases there were possibly greater impediments of different kinds than entirely favourable conditions. Maphumulo worked through his personal constraints, but crucially in an economic and social climate that was not conducive to the fulfilment of his interests. Who knows whether Ross would have achieved more at Sony, and what about her role as a female leader in a world of mainly male gamers? We do not as yet know whether *Halo 5* will rescue Xbox from stagnation. Each person had their particular conditions and their own set of constraints. More than their attributes, it is in their use and application for achieving specific goals that we find innovative people creating, making possible and enabling the emergence of something new.

We may debate endlessly about the right or optimal mix of skills and attributes necessary for innovation. Creativity, which subsumes imagination, is often regarded as the key attribute among innovators. Generating an idea needs both imagination and skill, but spotting an opportunity for that idea to work in the market needs a social context. If there is insufficient self-efficacy or effectuation, then the creative spirit may disconnect with the opportunities, and if there is a low threshold of tolerance of risk then calculated risk taking may not be possible to see through the creation of a new product. Then there is leadership which marshals all the four other attributes and works with a disparate talent grouping to drive the innovation process. Various tropes of abstraction and sampled reality have offered insights and speculated on their universality, more so because of the simple recognition that we are seemingly hardwired to create something new and desirable. What we do know is that the full set of skills is constantly applied in experimentation with technology, whether that be improving designs to creating spacecraft in the USA or making little gifts or souvenirs representing the Loch Ness monster in Scotland.

Inherent, but not necessarily explicit, in the innovation process and in the capability of people to engage with this process, is the unique ability to stretch the imagination, to mix, for example, sardines with white chocolate as Ferran Adria thinks is eminently possible in a world of meaningful change. We turn to another vignette to see how such 'stretch works'.

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### VIGNETTE 7.3    MIXING SARDINES WITH WHITE CHOCOLATE

#### INTRODUCTION

Ferran Adrià is a chef. He closed down his world-famous restaurant to start a foundation for innovation in 2000, asking, 'who says you can't mix sardines and white chocolate?'. Ferran works with a handful of web developers and user-interface designers and a creative team from his celebrated restaurant 'elBulli' in his *taller*, or workshop, in an eighteenth-century building in Barcelona. His vision is to create an online database that will host every possible item of gastronomic knowledge ever collected together – 'La Bullipedia'.

#### THE CREATIVE MIND AND TECHNOLOGY

How does Ferran look at products and information, which in his case is essentially about food? He refers to working with white asparagus as a scientific process and asks questions about what you can do with asparagus creatively. You can inject it with truffle oil, you can cut it up into little pieces and never identify them afterwards. Then within the website one can move forwards and backwards and curiously think of rhubarb and imagine how that vegetable can be injected. The focus here is on the technique, which is also the starting point, the chemistry, biology, physics and mechanics, rather than the product or its ingredients, the same creative focus which was behind the enormous success of his elBulli restaurant. The *Restaurant Magazine* had voted elBulli the best in the world in 2002 and subsequently 4 years on the trot from 2006 to 2009. In 2011, 2 million people sought a table at the restaurant, and there were at least 6,000 applications for internship for every stage in his kitchen. Over 24 years he and his team had created 1,846 dishes. Three Michelin stars and an appellation as 'undoubtedly the most brilliant creator in the world' by Joël Robuchon, the 26 Michelin star chef, crown his achievements.

#### CONSTANT INNOVATION

A life of endorsements, branches across the world and television appearances as 'super celebrity' chef would have been expected of Ferran following the extraordinary success of his restaurant. Instead, in 2010 he announced that elBulli was to close down. The industry and general press, including the *Financial Times*, concluded that 'la cocina de vanguardia' – the new wave of Spanish molecular gastronomy – was at an end. For Ferran, however, the limit of innovation in haute cuisine had been reached. The announcement of the closure of elBulli was followed within weeks of another pronouncement, namely his intention to set up the elBulli Foundation, a centre for

innovation where digital technology would remake and rethink haute cuisine and offer a road map for innovation for other activities.

Some 8,000 pages of the elBulli General Catalogue contain the 'genome of cuisine', a huge compendium providing details of Ferran Adrià's repertoire. In order to innovate he felt the need to move away from the concept of the restaurant to work out procedures for collaboration and address the nature of creativity by asking questions about the source of ideas and how they could be generated. Ferran's working life as a chef offers some clues to the answer to these questions.

Since the nineteenth century, gastronomy has been concerned with the perfection of dishes, with most kitchens operating along the lines of 'brigade de cuisine', which is a hierarchical system of specialisation where the kitchen is divided into sections supervised by a chef de cuisine. When Spain became the heart of the gastronomic world in the 1990s with chefs such as Ferran Adrià and Joan and Jordi Roca, they wondered, in common with most innovators, how things could be changed and improved from the way the incumbents were running the industry. Ferran was offered the opportunity to move to Barcelona by a customer, the sculptor Xavier Medina-Campeny, in 1992. It was the start of a 'revolution'.

For the first time chefs came together not to prepare dishes, but to study and commit themselves to theoretical work that would extend the scope of thinking and imagining what could be accomplished with food. All aspects of the discoveries they made were recorded in minute detail, photographed at each stage of evolution of any one dish. All ingredients were purchased fresh daily from the la Boqueria market and the chefs were also sent to hardware stores. Young chefs passing thought the town could walk in and find out what was being made as they were welcomed in a spirit of openness to and networking with the trade, unlike the secretive practice and tendencies of most chefs. The sharing of ideas was considered important for the continuous improvement of processes and products. The aim was to deconstruct whatever went before, to take chicken curry and treat each ingredient differently and remake it with new textures. Liquid would be mixed with alginic acid to create new spheres of different textures and consistencies such as 'caviar of melon', or to discover hidden tastes and smells. More a research project than a kitchen, the instruments and tools were more likely to be candyfloss machines, soda siphons, liquid nitrogen, dehydrators and syringes.

The Foundation is conceived as a place for experimentation 'by processes, efficiency and a way of auditing creativity', dealing with cuisine as discourse and communicating with other disciplines of science, the arts, philosophy and technology, presenting the findings through the Internet and producing creativity and talent. This vision of creativity is also to be found in the design of the Foundation complex. A number of new carbon-free buildings include a brainstorming area shaped like a gourd which doubles up as a cinema. An archive is found on top of the kitchen, an 'idearium' accommodates reference materials and workstations, and there is a plan to build an observatory of coral.

### THEORY AND EMPIRICS

Underpinning the creativity is a search for a rigorous theoretical framework to help build the culinary database. The framework is divided into five areas, all as part of

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an evolutionary map of eBulli's discoveries – organisation and philosophy, products, technology, elaborations, and styles and characteristics. This is consolidated with a highly imaginative taxonomy including the following:

- Products with soul.
- What is a sauce?
- Parmesan serum.
- Provocation, play, irony, decontextualisation.
- Smell, an overlooked sense.
- Sequences as micro-menus.

Underlying this creative experiment is serious empirical work that Ferran has carried out with, for example, a professor of experimental psychology at Oxford University, Charles Spence, on augmenting the taste and flavour of a dish by matching how, and on what, food is offered. Strawberry mousse is supposed to taste 10% sweeter when served on a white plate than on a black one. There is more than a hint of interest, and perhaps serious work, in neuroscience or 'neurogastronomy' according to Charles Spence.

The *Modern Gastronomy A to Z: A Scientific and Gastronomic Lexicon* that Ferran and his brother tried to produce is a major compendium of a cookbook that scrutinises ingredients at their chemical level. A periodic table at the centre of the book focuses on how food reacts under specific conditions and the different uses to which it might be put. An example helps to explain this work. Instead of a recipe for mayonnaise we find an entry for emulsion. This describes the condiment made from egg yolk, oil and vinegar as a 'colloidal dispersion of two immiscible liquids'. Every entry is accompanied by the title of the ingredient, the chemical code, a definition, and the various uses and practical information for cooks. In the latter half of the 1990s, Ferran took a keen interest in the way food was served and eaten. The displays of metal, glass, paper and slate dishes, and of multi-coloured plasticine maquettes representing the size and position of elements in elBulli dishes on the plate, bear testimony to this interest. So does the offering of some courses in some of his restaurants where knives and forks are not available and the food is eaten with one's hands.

Much of Ferran's fare could be described as an extraordinary mix of art and science. There is art and magic in molecular gastronomy. At the same time, frying an egg is also a chemical process, while cuisine stretches as a transversal discipline across homes, restaurants, hospitals, schools, airports, fashion and new technologies!

Ferran's Foundation is designed by a Catalan architect, Enric Ruiz-Geli, and his advisory group of thought leaders include the economist and Nobel laureate Joseph Stiglitz. Telefónica is a sponsor, supervising the technology following a relationship that started in 2010 when the telecoms company hired Stiglitz as an ambassador, and opened Ferran's eyes to the wonders of technology alongside his interest in chemistry and physics.

The technology platform is an extension of the Foundation's creative agenda. Together with data from elBulli, LaBullipedia uses open data and visualisation to

investigate where innovation could take place next. A distribution network generates video content daily, allowing users to post ideas for food pairing and suggestions for apps. The elBulli archive is available online, while food blogs are catalogued within the site. While the chefs curate recipes the technology team builds an archive using semantic technology. This helps users to discover relationships which they could not have found otherwise.

At the heart of a fantastic journey of food with algorithms, the opening of new restaurants and bars which serve liquid ravioli, spherical olives and water melon infused with sangria, the lecturing at Harvard, and even the movie, *El Bulli: Cooking in Progress*, showing worldwide, and the connection of the digital world to the physical one, is Ferran's all-consuming interest – the human emotion. Like many other celebrities, he has used both the power of fame and innovative thinking to move from one creative direction to another. Schwarzenegger switched from acting to politics, P.Diddy and Jay Z from music to sports clothing and spirits.

## CHALLENGES AND FUTURE DIRECTIONS

Nothing stirs the innovative Ferran more than food and the technology in a constantly changing environment. This is particularly relevant for Ferran as he faces the biggest challenge in his new frontier, and that is actually to make the Foundation work. Stacked against him are local environmentalists who are deeply concerned about the possible impact of his grand scheme on the landscape of Catalonia, the thousands of tourists who are expected to throng his foundation and the locale. It is unclear whether he wants to run his Foundation as another start-up. Existing as it does in the sphere of ideas it is uncertain how he will translate his ideas into a viable project. For now, knowledge and creativity are his two main strands of creative destruction. Knowledge creates while creativity deconstructs the process by which knowledge is created.

But what about the reality of such a 'dream'? At the conclusion of one of many long monologues, Mr Adrià was asked what he expected the Foundation's budget to be for 2015. He took a breath. 'One million euros,' he said. In response to a quizzical expression of doubt – moments earlier, he said he intended to have a staff approaching 75 – he explained: 'We will hire a lot of interns.'

In the meantime, projects abound with each leap in the knowledge creation and deconstruction processes. The El Bulli Lab is the Barcelona-based office where people with creativity and knowledge (the El Bulli DNA) do their work. Then there is 6W Food, which is expected to operate as a cross between a science museum, an art museum and a house of culinary innovation. A search engine known as SeaUrching (named in part for the delicacy) is complemented by a language to describe gastronomy known as Huevo (Spanish for egg) which could eventually become a digital language coded for use by refrigerators or other kitchen appliances. In the meantime he is working on a side project as a consultant with Cirque du Soleil, stating that 'We are helping create a restaurant that is not a restaurant.'

Innovation beckons as Ferran Adrià conjures up food in a future of algorithms and creativity.

*Sources*: Adapted from Williams (2012) and Borden (2015)

Ferran Adrià's story is not a common story of innovators. The original list of skills and attributes, referred to by Chell and Athayde (2009), appear to fall a bit short in capturing the essence of innovative capability of an unusual and extraordinary creative person such as Ferran Adrià. Perhaps any reductionist approach at modelling innovative behaviour would fail, not least because many such people are outliers, and outliers are all different not only from the norm but from other outliers too. But then innovators do not always share common stories. Our analytical search for common characteristics offers possibilities for comparison but not recipes for cloning! The greater the variety of innovators in any organisation or even in an economy, the greater the possibility for change through innovation.

Ferran Adrià's story does, however, illustrate clearly the evolution, including the stops and starts and the unexpected directions taken in the process of evolution of the innovative mindset. To understand the evolution of this mindset and the portfolio of innovative skills and competencies we may benefit from insights from history and archaeology. Innovation is often associated with thinking outside the box, so it may be useful to stretch our thinking beyond the traditional ramparts of academic disciplines that provide our sources of knowledge and understanding of the subject of innovation. Stretching our learning back to trace the history of innovative people could offer unique insights.

## THE EVOLUTION OF INNOVATIVE PEOPLE

Historians and archaeologists argue that our early ancestors left little or no visible record of innovation for nearly 3.4 million years. Livelihood and sustenance were made possible with digging or jabbing sticks to obtain food. Acts of ingenuity of an extraordinary kind probably occurred 2.6 million years ago in Ethiopia when wandering hominids began to flake cobblestones worn by water to create cutting tools. They were able to do this with hammer stones. Researchers have not found anything beyond minor incremental advances to the handheld axe for nearly 1.6 million years, which they then followed with a long-held view that about 40,000 years ago, in the Upper Palaeolithic period, *Homo sapiens* suddenly went on a creative, inventive spree in Europe, decorating cave walls with paintings of Ice Age animals, making shell-bead necklaces, and breaking into pieces a range of new stone and bone tools. This inventive surge was attributed to a random genetic mutation which sparked off a huge leap in cognitive capability and ignited a creative 'big bang'. New evidence from archaeologists in South Africa suggests, however, that art and advanced technology have antecedents going back to a time before the emergence of *Homo sapiens*, 200,000 years ago. What we refer to as the force of innovation today is likely to have evolved over hundreds of years due to a mix of biological and social factors (Pringle, 2013).

Perhaps about 77,000 years ago the occupants of Sibudu Cave, about 40 kilometres from Durban, South Africa, used an astonishing knowledge of local vegetation to create a brittle form of bedding with rushes and other plants for sitting and sleeping on. To make these beddings the occupants used leaves from *Cryptocarya woodii*, a tree which contained natural insecticides and larvicides that are effective

against malaria-carrying mosquitoes. These creative Sibudu people crafted bows and arrows, and researchers have found that the cave occupants were probably also 'competent chemists, alchemists and pyrotechnologists' (Wadley et al., 2011, cited in Pringle, 2013), who were probably the original standard bearers of technical ingenuity. So were the hunter–gatherers from 100,000 and 72,000 years ago, and the Neanderthals who 300,000 years ago made birch-bark-tar glue to fasten stone flakes to wood handles and fabricated hafted tools.

Something else, however, distinguishes the depth and range of innovation that modern humans have shown to be capable of when compared with our remote for-bears. That has to do with brain size, with scientists claiming that even 100,000 years ago *Homo sapiens* had a mean capacity of 1,330 cubic centimetres and 100 billion neurons transmitting information across approximately 0.15 quadrillion synapses, demonstrating the connection between intellectual productive gain and the size of the brain. The large size of the brain allowed for free association of different stimuli and the encoding of multiple messages from a specific episode.

Crucially, what helped with survival was not simply the free association of stimuli but analytic thought, which enabled them to move from one mode of thought to another. What lies beyond such analytic capability is referred to by anthropologists as cultural ratcheting, the ability to take the ideas of others and 'put their own twist on them, adding one modification after another until we end up with something new and very complex', from one individual to another and from one generation to another. At the heart of this cultural ratcheting are the social skills and various cognitive abilities referred to earlier in this chapter. The crunch came with demography, according to evolutionary geneticists such as Mark Thomas of University College London (Pringle, 2013). The larger the group of people, the greater the chance of an individual learning an innovation, suggesting that, much more than the ability of the smart individual, it is the group of connected individuals who lead on the innovation front. This sense of a demographic network now enjoys almost unlimited collective advantage with the use of the World Wide Web, especially in urban regions where more and more people crowd together sharing ideas, inventions, resources and passions.

Just as the larger brain enables free association of stimuli, so indeed does the larger physical space in which we connect and engender creativity and innovation for the community. The complexity of the mind is associated with the connectivity of networks of people to help innovation thrive. It is in the mix of different innovative people and in the layering of their capabilities across both space and time that we find the essence of innovation and the value of innovative people. The management of the innovation process can, therefore, be read as the management of collective genius.

## MANAGING COLLECTIVE GENIUS

So far, in whatever we have examined about innovative people, we find that it is in the social process and the social interactions among different people that innovation is obtained within an organisation, the economy and wider societies. What makes this

possible is the appropriate blending and management of the varied mindsets, skills and resources. We could, therefore, argue that in referring to innovative people we are really reflecting on the collective dynamics of multiple individuals in specific contexts.

Let us consider how innovative people are organised and managed in innovative organisations. This not only helps us to connect people to organisations, but also emphasises the point about innovative organisations being different from others because of innovative people, and how they come together to make innovative products, services and business models that underpin their high-impact productive value.

## VIGNETTE 7.4   ANIMATING CREATIVITY

### INTRODUCTION

Hill et al. (2014) explain the significance of this issue with reference to Pixar Animation Studios and how they have managed to produce blockbusters continually for nearly 20 years now, commanding the respect of technologists, the business community and, crucially, film makers. Pixar's success is attributed less to the solitary, inspirational genius of Steve Jobs, who bought the original company, Lucas Film, in 1986, but more to the hundreds of people, their wealth of ideas, their work, and the massive amounts of investment and, critically, the unique environment that Ed Catmull, the computer animation pioneer, helped to create. Catmull is known for his clever and dexterous approach to management, some of the secrets of which he shares with the world in his best-selling book, *Creativity Inc.* (2014).

### THE CATMULL CREATIVE COLLECTIVE

As President of Pixar, Catmull provided a form of leadership that fostered and enabled innovation. This he continues to do with John Lasseter, the Chief Creative Officer, of both Pixar and Disney Animation Studios (Disney acquired Pixar for $7.4 billion and installed Lassater and Catmull to shape the creative culture on Disney's own shaky creative studio).

It is impossible to extricate the leadership of Catmull from the work of the creative collective at Pixar. This is because every aspect of any film that Pixar produces – 'everything, down to the tiniest speck of dust or the subtle flow of a shadow across a character's face' – is selected, created, invented, inserted and implemented by each one of the hundreds of people involved. Figure 7.1 shows a summary of the overall process.

### THE INNOVATION PROCESS

The editorial process involves the director's idea of a story and the working out of the story through many revisions in the story department for between 12 and 18 months. The ensuing description of the story leads to a script, which is then translated into images or individual storyboards which in turn are cut to produce reels. The art department works on the 'look' and realisation of 'characters', while the editor together with the director cut the storyboards and create reels that bind the art, the dialogue and

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┌─────────────┐   ┌─────────────┐      ┌─────────────┐      ┌─────────────────┐
│ Storytelling│   │   Artwork   │      │Modelling and│      │Layout, set dressing│
│             │   │             │      │articulation │      │  and shading    │
└─────────────┘   └─────────────┘      └─────────────┘      └─────────────────┘
```
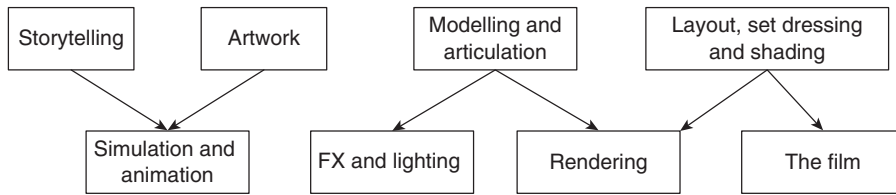
FIGURE 7.1   Pixar and the film-making process

the music, with the reels being updated and refined at every stage of the production process. Once the work moves to various groups of artists and technicians, they use design software to create many thousands of digital components that make up the final film, with each group being entrusted with different creative activities such as digital settings, digital models of the characters of the stories, and layout work scoping how the characters and different objects will be shot. While lighting experts will manage the amount of light to fall, animators will define and specify the precise movements of the characters. Then there are those who create the surface textures (skin and hair, for example), the way in which light interacts with those surfaces, and simulators who produce the digital versions of the movements or actions of the characters, not forgetting the special effects people working on complex movements of objects and characters. Finally, hundreds of computers 'render' or use the instructions for the earlier stages to work out each movie frame (over 100,000 frames), frame by frame, at 24 frames per second (Hill et al., 2014).

Creativity is expected to prevail at every step of the process described above, and the leader is dependent on all the creative people's actions at each step. The creative production act is a synthesis of the creative actions of all the people involved. What the leader does is create an environment for:

- collaboration – allowing for the mix of talent and for the necessary interaction of ideas, using a number of instruments such as staff watching and discussing presentations of work in progress;
- engagement in discovery-driven learning – working through a messy process by solving problems;
- encouragement of integrative decision making – experimenting with and integrating ideas, making integrative choices based on the mix of those ideas, combining and recombining them as appropriate.

## ORGANISATIONAL PLURALITY

Appropriate mechanisms with unusual organisational arrangements need to be in place to optimise the value of collaboration, engagement in discovery-driven learning and integrative decision making. In Pixar, this mechanism is called the Braintrust. Braintrust is a kind of rolling collective of the best of the creative brains supporting and guiding every film during the development phase. The membership of the group changes, but it grew out of a core team of highly distinguished directors, including

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*(Continued)*

Lasseter, Andrew Stanton, Peter Docter and Le Unkrich (directors of films such as *Finding Nemo*, *Monsters Inc.* and *Toy Story 3*). Catmull and Lasseter describe the Braintrust in eloquent terms. They speak of a group that gets together to address a problem, meeting every 12 weeks, starting with a screening of the most recent cut of a film, and then providing notes on what is deemed acceptable and what needs improvement. But the notes are not seen as 'mandatory notes'; rather they are instruments of open and constructive feedback. Their notes do not carry any more weight than those of the animators. No one owns an idea exclusively, and they all rely on stimulating each other with their range of ideas. As Lasseter notes in his interview by Franklin-Wallis of *Wired*, 'At the end what you have is this feeling that everybody has shared ownership and being proud of the whole thing'.

The notion of a plural identity underpins the capabilities of Pixar's innovative people.

*Sources*: Adapted from Hill et al. (2014); Franklin-Wallis (2015)

These three dimensions – collaboration, engagement in discovery-driven learning and encouragement of integrative decision making – permeate the work of all the organisations that Hill et al. (2014) studied, including HCL Technologies, eBay, Pentagram, Google and others. Isaacson finds the same strength of collaboration among hackers, geniuses and geeks in the creation of the protocols of the Internet which, as he states, 'were devised by peer collaboration and the resulting system seemed to have embedded in its genetic code a propensity to facilitate such collaboration' (2014: 4). In common with other breakthrough innovations, such as the printing press, the idea of collaboration (open networks in the case of the Internet) has opened up opportunities for citizen innovators not circumscribed by traditional or restrictive gatekeepers of knowledge. As Isaacson notes, collaborative and networked creativity marks the interaction between humans, between humans and machines, and between arts and sciences. Here too we find the idea of cultural ratcheting as we found among *Homo sapiens* of 100,000 years ago.

We can count on collaboration and networking skills to be at the forefront of the list of competencies, behaviour and actions of innovative people. It is in the identification of different capabilities that organisations can best harness diverse talent for innovative outcomes. Assessing the human capital of people is one approach, but there is a tendency here to use a definitive set of exemplary attributes that pertain to 'special people' (think of Steve Jobs or Jack Ma) and to try and measure capabilities on, for example, a scale of 'poor to excellent' attributes. Doing so does not help to realise the different capabilities that are brought to bear on an innovation. As the Pixar study shows, it is the identification and mobilisation of a range of capabilities that facilitate innovation. Examining, assessing and evaluating actual abilities of various individuals both to use their capabilities and find the opportunity to do so form part of what we can consider to be a capabilities approach to promoting innovation.

## CAPABILITIES APPROACH TO INNOVATION

If innovation leads to change in terms of new products and services, and new ways of organising firms, then developing a framework for the evaluation and assessment of individual well-being and social arrangements, the design of policies, and proposals about such change, can be useful. The capabilities approach can be traced back to, among others, Aristotle, Adam Smith and Karl Marx, but its most prominent, modern form has been pioneered by the economist and philosopher Amartya Sen (1980; 1984; 1985a; 1985b; 1987; 1988; 1989; 1990b; 1992; 1993a; 1999), followed by some significant development of the ideas by the philosopher Martha Nussbaum (2000; 2011) and others such as Deneulin and Shahani (2009).

Although this approach has been tested in a wide range of fields, in particular in development studies, welfare economics, social policy and political philosophy, it has by and large been ignored in the innovation and entrepreneurship literature. Yet if collaboration, engagement, discovery-driven learning and integrative decision making were to be effective in innovative organisations, then exploring the well-being of people, not simply in terms of what they possess but of what they can choose to do in particular environments, can be deemed an essential requirement.

Allowing for the necessary freedoms individuals can have to pursue their own learning, improve their self-efficacy and sharpen their perceptions about what they could achieve would be important considerations for managers of organisations. The focus here is less on personal utility, the acquisition of specific assets, reputation or wealth and overcoming restrictions on rights, and more on the capability to function or the turning of capability to 'functionings'. As Sen explains:

> Functionings represent parts of the state of a person – in particular the various things that he or she manages to do or be in leading a life. The capability of a person reflects the alternative combinations of functionings the person can achieve, and from which he or she can choose one collection. The approach is based on a view of living as a combination of various 'doings and beings', with quality of life to be assessed in terms of the capability to achieve valuable functionings. (1993b)

With respect to innovation, functionings can include work–life balance, being technically literate, being creative, being healthy, being part of a community of interest, being respected and having space to generate new ideas and solutions to problems. The distinction between functionings and capabilities is between 'the realised and the effectively possible; in other words, between achievements on the one hand, and freedoms or valuable options from which one can choose on the other'.

In the context of innovation, and given the assumptions about the positive value of collective endeavour in organisational innovation, we can argue that ensuring that people can have the space to choose to function innovatively is critical to innovative outcomes. Supporting innovative people in their effective opportunities to undertake the actions and activities that they want to engage in, and be whom they want to be on an innovation platform, need to be factored into organisational policy

and practice. Removing barriers in their work so that they have more freedom to function creatively to deploy their skills, to generate new ideas and to fulfil objectives (their own and those of the organisation), so that they have a reason to value what they do and can do, is part of the evaluation process. The end objective of an innovation outcome and the recycling of the innovation process have intrinsic importance. The means are instruments to achieve the ends. This is one reason why no de facto minimum architecture for innovation in an organisation may work as a standardised project for innovation. Crucially, an emphasis on organisational routines that can corral people to operate effectively in only one gnostic way may actually deter innovation. In reality, ends and means may blur because some ends are simultaneously means to other ends (e.g. the capability of being technologically savvy could be an end in itself, but it may also be a means to achieve the capability for innovation practice).

This brief reference to the capabilities approach is a very modest attempt to apply a much broader, more detailed and highly philosophical set of theories to ways in which we can best understand and support innovative people. Researchers on the subject may well consider a proper appreciation of the approach and a systematic application to innovation management through empirical work. What we can draw from this synopsis is an understanding of the reality of managing innovative people, a reality which impugns straitjacketed management ideas of goal congruence, routines, shared vision and systems thinking. The capabilities approach also helps to disentangle firms from people, and the idea of a firm's capacity to rely on a stock of inimitable resources of human capital to innovate from the individual capabilities for innovation in that stock. As we have seen from the Pixar example and from our observations of and insights into innovative organisations (see Chapters 5 and 6), management practices that rely less on managing people as 'commodities' (uniform stock of people evaluated in terms of set criteria of achievement), and more on managing different levels of capabilities-based on gender, ethnicity and other forms of diversity, tend to derive the gains from innovative advantage. Encouraging employee involvement and innovative behaviour in organisations can, therefore, be considered a worthwhile objective for managers.

## THE INVOLVEMENT OF INNOVATIVE EMPLOYEES

A focus on capabilities inevitably leads to the question of involvement of people in the innovation process in organisations. Various studies have tried to articulate the role of employees in contributing to innovation outcomes in firms (Feldman and Pentland, 2003; Kristiansen and Bloch-Poulsen, 2010). Such involvement tends to vary across sectors. De Jong and Vermeulen (2006) found that knowledge-intensive industries accommodate more innovative employees than others. This may be due to a concentration of highly skilled technical jobs in those organisations, thus reflecting a possible bias towards technology-oriented firms and the normative association between technology and innovation. Manufacturing firms, with their division of

labour, project-based and shift-work patterns, and various occupational divisions, can restrict innovative behaviour among employees (Aaltonen and Hytti, 2014).

One way of identifying innovative behaviour is to observe different aspects of practice. Innovation can be seen as a phenomenon that is formed and reformed through the practice of individuals (Corradi et al., 2010). Here individual actors navigate their way through institutional routines, discern the embeddedness of work in the organisational culture, and absorb knowledge from within and from outside the firm. In terms of activities, this takes the form of conceptualisation, effectuation, application of both codified knowledge and heuristics, problem identification and solutions, and resolution of issues individually and collectively. In large firms these activities may play out among different groups, between groups and collaboration with end users, ending with integrative decision making (Hill et al., 2014). In smaller firms there is the added difficulty of balancing the owner–manager's multitasking capabilities, the emotional attachment to processes and outcomes, and the internal locus of control which may prevent employee involvement. Curiously, however, it is in this very controlled environment of the small firm that the employee is also expected to 'muck in', to work alongside the owner–manager and deal with all eventualities, self-organising the diversity of practices that would otherwise be divided among several individuals in a larger business.

This chapter on innovative people cannot be complete without special reference to the gender dimension to the subject of innovative people. So many debates in management and organisational psychology, and increasingly in entrepreneurship, are addressing the specific roles and contributions of women that we would be remiss not to refer to their innovative leadership functions. More importantly, obtaining an understanding of the gender dimension could help us to acquire a sharper and nuanced understanding of the breadth of innovative endeavour.

## INNOVATIVE PEOPLE AND THE GENDER DIMENSION

Various studies on entrepreneurship and gender argue that the phenomenon of entrepreneurship is gendered (Minniti, 2009) and that gender is embedded in processes, meanings and experiences (Carter and Shaw, 2006; Ahl and Nelson, 2010). These studies form part of the discourse and empirical work in the field of entrepreneurship. Gender does not enjoy a high status in the innovation literature mainly because, as we stated at the beginning of this chapter, innovative people do not get good press. If process, systems and organisation are seen as the principal building blocks for the study of innovation, then people, let alone women, become more or less invisible and under communicated (Brannback et al., 2012). Considering people helps us to understand the human capital, skills and capabilities that drive innovation. Considering gender enables us to comprehend the richness of different forms of innovative endeavour among people.

What can we find in the literature that sheds some light on our understanding of the gender perspective?[1]

## *THE GENDER PERSPECTIVE*

Comparative studies on gender differences and similarities in innovation dominate the rather sparse literature on gender and innovation. Quantitative studies of innovation in male- and female-owned businesses, together with the literature on gender differences on standard measurable inputs and outputs such as patenting and commercialisation, suggest that male researchers are more likely than female researchers to engage in industry cooperation (Azagra-Caro et al., 2006; Bozeman and Gaughan, 2007). A study by Whittington (2011) showed that 'academic mothers' are less likely to take out patents, probably because of the uneasy relationship between family responsibilities and workplace achievements that may impede women's ability to innovate. Interestingly, Foss et al. (2013) found that women are equally innovative in generating new ideas compared with men, but that women's ideas do not travel well in terms of implementation, often because of a lack of collegiate support (Poutanen and Kovalainen, 2013). If organisational practices and the glass ceiling of gender bias are factors, then the trouble lies with those organisations that are unable to derive value from the work of creative women.

The same gender bias is also evident in the deployment of research grants, not least because policy and research on innovation suffer from this deficit of bias (Viner et al., 2004). There appear to be layers of stereotypes, assumptions about the innovation construct itself, separate roles and consequent discrimination: women are typecast as being interested in work in industries that favour women; women do not tend to implement ideas because their role as 'mothers' can inhibit them from realising their working goals; women are only interested in 'feminine' issues, and so on and so forth. Consequently, comparative studies of men and women in innovation may be inherently biased because of possible assumptions. As Wikhamn and Knights (2013) have indicated, there is a need for some vigilance on the part of researchers when notions of femininity and masculinity are attached to women and men.

Feminist studies have pointed out that the innovation concept is in itself replete with male connotations (Blake and Hanson, 2005; Nahlinder et al., 2012), resulting in public support for innovation or R&D for men by men. Notions of masculinity underline the scientific, technological and engineering fields (Wajcman, 2010; Dautzenberg, 2012). Even ostensibly less institutionalised forms of innovation, such as open innovation, are swayed by male-oriented organisational practices (Wikhamn and Knights, 2013).

The issues highlighted in this part of the chapter are those emanating from a notion of disadvantage that is the result of the inadequacies of men. The literature is even more limited on the role, function and achievements of women such as Bonnie Ross (described above) and their endeavours that overcome the dysfunctional constraints of male hegemony.

But instead of dwelling on the imposed barriers and the assumed ontological differences in our understanding of female innovators, it may be worth examining women in practice, together with their objectives, behaviour and how they make new products, provide services and create new forms of organisations.

That women excel in as diverse a set of areas as robotics, finance, biomedical engineering and education is not in doubt. In these pursuits such women have not

only entered previously male bastions of technology, but also earned their rightful place as leaders. However, real leadership is probably being demonstrated through a different model of operation which defies standard business models and expectations in the marketplace. If there is anything that is crying out for change it is in the way business is conducted in the face of dramatic conditions that are affecting our environment: social structures due to rising inequality; demographic imbalances with rapid ageing of the population, especially in developed economies; water and food shortages; and the cul de sacs of growth that are holding back economies across the world as scarce resources defy economic equilibrium arguments. It is here, perhaps, that women are taking up a real challenge in taking new directions for doing business.

Female innovators are increasingly being seen to adopt a humanistic approach to enable positive change. This humanism considers people and the problems they face first, before relying on applying a known set of skills to any given situation. The innovation is in the actions taken to mix 'hard' technology' with 'soft' humanism to run socially conscious enterprises that work towards earning social returns on investment as strongly as they pursue economic surpluses. This notion of organising resources, structures and processes around social and economic goals is in itself innovative. The use of technology and creativity simply enhances the innovation.

## VIGNETTE 7.5  OF WOMEN, BY WOMEN, FOR THE WORLD: TWO MINI CASE STUDIES

### SANGEETA BHATIA

Take the case of a graduate of MIT and Harvard, a biomedical and mechanical engineer, physician, professor, inventor and entrepreneur, Dr Sangeeta Bhatia, who fights disease through innovation. Recognised as one of the most innovative young scientists worldwide and one of the 100 most creative people in business, Dr Bhatia is the co-founder of biotech start-ups Zymera and Hepregen. She won the 2014 Lemelson-MIT Prize of $500,000 for her ground-breaking inventions in miniaturised biomedical technologies and youth mentorship.

### THE APPROACH

Dr Bhatia sees herself as being an impatient inventor. She looks at the size of a challenge knowing well that there are really big problems out in the world today, and her motivation appears to be seek to move beyond what has been found already. The two inventions which have singled her out as a champion in her field(s) are the synthetic biomarkers that detect cancer through a paper urine test and a human microliver built to fight infectious disease by predicting drug toxicity and interacting with human pathogens. The microlivers provide a basis for an engineered liver that may one day replace the need for transplants in patients with liver disease. Her portfolio of

*(Continued)*

*(Continued)*

inventions reflects this. In addition to drug toxicity and cancer therapeutics, she has addressed problems in the areas of tissue regeneration, non-invasive diagnostics and infectious disease.

Dr Bhatia's education and skills no doubt put her in a very good position to work towards successful outcomes. However, it is in her mentors and in the diversity of interests and experience that she finds an explanation for her own success. They 'saw more for me than I saw for myself'. There is a strong recognition of how innovation occurs when different disciplines collide. Her own training in miniaturisation as an engineer made her understand that alongside the big field of microfabrication, which was invented for making computer chips, there was also the other world of nanotechnology, a materials science invention. At the interface of these two technologies lies the possibility for medical applications. According to Dr Bhatia, combining these fields helps scientists to leapfrog in advances, something which she and her team have been trying repeatedly with diverse teams of people with varied perspectives and experiences.

### OVERCOMING CONSTRAINTS

One of the struggles that Dr Bhatia had to contend with was finding women who had the life she thought she wanted. Having not found many examples as she honed her talents, she has dedicated herself to the advocacy of STEM (Science, Technology, Engineering and Mathematics) fields for women, and to try and find more women who could pursue high-tech entrepreneurship.

### SOFIA APPLEGREEN

Sofia Applegreen, a Swedish entrepreneur, launched a company called Mitt Liv in 2008 to help immigrants into Swedish society, to help create a platform for people from around the world so that they can be part of an inclusive society. Her objective was to find a way to solve the problem of what she describes as the two doors for immigrants coming into Sweden. A generous immigration policy welcomes migrants through an open door, while a closed labour market door shuts them out of employment. Applegreen's solution is to pair smart, keen and capable young immigrant women with mentors who offer advice on job résumés, applications and interviews, through her company. But Mitt Liv is not a charitable organisation. Large Swedish corporations pay Applegreen's firm to take on mentees and also to advise the companies on diversification of the workforce. This business model has helped Mitt Liv to grow from 40 to 400 people who are mentored every year from September to June.

Applegreen finds solutions rather than dwelling on problems, focusing more on what people can achieve in terms of their capabilities than on what they perceive themselves to be or how they are perceived by others. It is through this sense of determination that she has built her reputation and enjoyed success. She runs Mitt Liv from offices in Gothenburg, Stockholm, Malmö, Linköping and Norrköping, and has plans to set up more offices elsewhere in Sweden, with the hope that the success of her work in integrating immigrants better will eventually drive her out of this business!

*Sources*: '6 Innovative Women to Watch in 2015', www.entrepreneur.com/slideshow/240845; Gibson (2015)

In Sangeeta Bhatia's and Sofia Applegreen's stories we find unique, innovative qualities which at first glance may not be attributable to gender. The fact that they both seek new directions, work collaboratively in a non-linear way across disciplines or with seemingly intractable problems, have remarkable energy, and are realistic about implementing specific actions makes them as innovative as any of their male equivalents. It is probably in the choices they make, the wider social objectives they set, in their use of economic instruments and, importantly, in their humanistic approach to solving problems that we find differences in approach (from males) to performing innovative actions. It is, however, difficult to claim that they are doing anything which men cannot or do not do. Their actions do not reveal a female prerogative, but it is possible that the motivations which guide them distinguish these women as a different set of leaders who inject a greater sense of humanism into the world of innovation. If by focusing strongly on a social objective to the generally technology-oriented projects of innovation they compel us to recreate a different set of beliefs and attitudes, then that in itself could be a harbinger for a meaningful gender-based definition of the innovation process.

## CHOICE, PREFERENCE, KINSHIP AND THE USE OF PERSONAL NETWORKS FOR INNOVATIVE OUTCOMES

Access to bastions seen as traditional reserves of men and redefining approaches to work as entrepreneurs are not the only way women carve out their unique role as innovators. Empirical evidence suggests that the choices that women make and the preferences that they show for managing early-stage growth of their ventures can be uniquely innovative. The innovativeness is expressed in their motivations for growth, heuristically-oriented but conscious preferences for specific types of partnerships in particular economic and social environments, a departure from normative patterns of growth trajectories of female entrepreneurs and, in some cases, a culturally complex and collective sense of growth which emphasises the benefits for the collective over the individual firm's interests.

Take the case of established second-generation Pakistani female entrepreneurs in European societies. They represent a unique constituency for research. In the UK they represent British women entrepreneurs. As ethnic female entrepreneurs they are regarded as 'voluntary entrepreneurs' in terms of the choices they make as women and as members of their communities with better access to opportunities, information and resources than their immigrant counterparts (Peters, 2002; Sahin et al., 2007; McPherson, 2010). While their Islamic identity distinguishes them from members of other minority communities, the presence of the new immigrants – Bangladeshi, Turkish and Arabic migrants – encourages new alignments with other Muslim female entrepreneurs. Ethnic, religious and gender heterogeneity are often exhibited by way of the generational differences in entrepreneurial intentions (Sullivan et al., 2009) within various ethnic groups, their motivations (Levent et al., 2003; Rušinovi, 2006), the choice of business sector (Gersick, 1997) and in their growth aspirations (Kourilsky and Walstad, 1998; McGregor and Tweed, 2002). These combinations can affect positively or adversely the growth of their ventures and the organisational innovativeness that is evinced in the outcomes of their endeavours (Rauf and Mitra, 2016).

The literature on growth and gender suggests that business performance influences the self-perception of women entrepreneurs and their abilities to realise business growth, given the social desirability and legitimacy attached to successful business outcomes (Anna et al., 2000). As businesses grow, women develop similar networks to those of men (Klyver, 2007; Klyver and Foley, 2012). Others note that that the results are inconclusive (de Bruin et al., 2006; 2007). Negotiating these networks is often a function of trust that is embedded in the structures of social networks in the form of strong or weak ties (Granovetter, 1973). For second-generation Muslim female entrepreneurs, trust is a function of ethnicity, gender and religion played out through weak and strong kinship, friendship and business ties, but mostly through personal and social networks, including the emotional and financial support provided by the family (Baines and Wheelock, 1998; Aldrich & Cliff, 2003; de Bruin et al., 2006).

Rauf and Mitra (2016) found that, despite exposure to the wider relationship domains, the personal networks of second-generation Pakistani female entrepreneurs are a product of gender and religion which permeate ethnicity, kinship, friendship and business or professional ties. Kinship and ethnicity are kept at bay, while religion appears to underpin their gendered business activities, based on notions of trust. The maintenance of dense gendered networks results in the slower growth of the business and therefore in a brake on the aspirations that they may have for their enterprises. However, this conventional view is countered by the idea of growth as a female community issue where the lower growth of individual businesses is compensated in collective form by the growth of many businesses in the network. A critical counterpoint to growth theories based on the growth of individual firms can be found in how young Muslim female entrepreneurs link their aspirations for growth to the benefits derived from social correspondence with other Muslim female entrepreneurs. So while slower growth may be the outcome of operating in dense gendered networks for individual entrepreneurs, the social value of collective benefit outweighs the loss of individual gain. Both the process of using personal networks selectively and the socially beneficial outcome are manifestations of a form of innovative socialisation of growth. Whereas individual growth of any one firm is often accompanied by the loss experienced of others in terms of trade-offs, here we find the slower growth of many compensating for the random, fractured and unsustainable and normative patterns of growth. The innovation is in the complexity that underpins simple choices and the navigation of personal networks guided by preferences for processes, people and cultural institutions that enable growth.

## CONCLUDING OBSERVATIONS

It is not uncommon to find few chapters in recognised texts with sufficient reference to the role of people, as individuals, as teams or as networks. Good trade and other business or technology magazines tend to reveal much more through interviews, snippets and stories. It is difficult to keep track of the large variety of people and cohorts who drive, engineer and make innovation possible. Their behaviour often challenges received wisdom and theories. We know that we can study them from

economic, sociological, managerial, psychological and other perspectives, but the innovative mind probably cuts across all of these theoretical domains. Part of this difficulty of labelling people in conceptual terms may be due to the fact that the attitudes, capabilities and competencies of innovative people find true expression in the contexts in which they operate, in their organisations, in networks and in the wider environment. We examined how these attitudes, capabilities and behaviour contribute to the innovative character of organisations in Chapters 5 and 6.

## SELF-ASSESSMENT AND RESEARCH QUESTIONS

1. Do innovators have the same characteristics as entrepreneurs?

2. Why are innovative people generally 'invisible' in the literature on innovation?

3. Are we better able to understand the innovation process by examining innovative people?

4. Does the examination of a gender dimension to innovation help us to understand better the role of men and women in the innovation process?

5. How do organisations manage innovative people?

# NOTE

1. Some of the references in this section are drawn from the article 'Gender and innovation: state of the art and a research agenda' by Alsos et al. (2013).

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