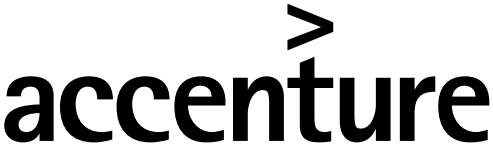
Fundación
de la Innovación
Bankinter

14

The Art of Innovation and Entrepreneurship

When ideas become wealth

- What exactly do we mean by innovation?
- The jigsaw puzzle of national innovation
- The new coordinates of innovation
- The present and future of innovation in Spain
- Creating an entrepreneurial ecosystem



Alto rendimiento. Hecho realidad.

Accenture has worked with the **Bankinter** Foundation of Innovation on the production of this Future Trends Forum (FTF) study and also helps to disseminate the work of this leading independent voice in the field of prediction and innovation. The consultancy firm has placed all its knowledge at FTF's disposition, together with its extensive expertise in turning companies and institutions into high performance organisations.

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Many thanks.
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Executive Summary

Innovation: a promise of change for the world

Human evolution has been marked by innovation. In politics and business, innovation is now being seen as a way out of the current crisis. The Future Trends Forum experts agree with this assessment, but although they consider innovation to be necessary, they feel it needs to be undertaken with patience and viewed as a medium and long term investment.

The crisis has underscored the importance of innovation for the sustainability of business and society. In 2010, seventy two percent of companies stated that they saw it as a strategic priority. The struggle for business leaders and politicians today is not to prove their commitment to innovation, but to demonstrate their capacity to implement innovation initiatives effectively. Innovation is characterised by uncertainty and leaders must learn how to manage it. They need to understand that innovation can have its origins anywhere within the extended organisation —not only amongst staff, but among other stakeholders too. However, innovation cannot flourish without the right culture. Only cultures that tolerate mistakes encourage entrepreneurship and innovation.

There is no single, concise definition of innovation; defining the concept precisely is both a difficult and a largely unnecessary task. What is important is to understand the pillars on which innovation is based and strengthen them. Knowing their properties and how they operate, we will be able to build the foundations of the modern economy. Above all, we need to respect one essential truth: the sustainable innovation does not depend on a region's policies or institutions — it depends on its companies.

The pieces that make up the national innovation puzzle

National innovation agendas are not recipes, but the Future Trends Forum experts have identified a number of ingredients that are necessary in order for innovation and entrepreneurship to flourish. In broad terms, the six main pieces in the puzzle of innovation are:

The government's role

Public authorities and governments play a central role in innovation; the regulatory environment influences how companies take up new business opportunities. The World Bank's *Doing Business* reports put figures on the ease of setting up business in different countries. The various factors they analyse can be used as a starting point for governments. The function of the administration is to pave the way for innovation to happen.

Innovation in business

A company's margins inevitably shrink as a particular product or service becomes consolidated. Sustainable growth cannot be maintained through business-as-

usual; firms need to look for new sources of profitability and to do this, they have to place more emphasis on innovation.

Innovation in business consists of cultivating and compiling all the ideas that arise in the organisation, taking them further and implementing those that are viable. Ideas can emerge not only from within the organisation itself, but also in its wider setting. Managers need to develop a culture in which employees, customers and providers feel that they form part of a dynamic organisation in which innovation is encouraged. This will happen spontaneously, but only with the right culture it is possible to achieve the sort of regularity in innovation that marks an innovative company.

Education in innovation and entrepreneurship

The FTF experts all agree that entrepreneurs are not born, but made. There is no "right" time for training in entrepreneurship: training in the subject must be offered throughout the whole educational cycle. Education in entrepreneurship is essential for developing the human capital needed for the society of the future.

Primary education, because it covers earlier age groups, lays the foundations for this development and is the best place for fostering an entrepreneurial culture. The university, where people acquire more specific knowledge, is the right place for encouraging an innovating culture. Business schools also have an important role to play in innovation, since it is here where the leaders who will have to manage innovation will be educated.

People in the innovation process

Ultimately, the source of all innovation in a company, region or country is people. Innovation requires creative people with initiative, but this initiative is the primary identifying mark of an innovator. Given the right context and opportunity, nearly any citizen can come up with a creative idea. It is the initiative and capacity to put these ideas into practice that defines an innovating culture. The important thing is to encourage entrepreneurial spirit and this can only be achieved with the right motivation.

The Future Trends Forum experts identify two major sources of motivation. The first involves some burning desire, hunger or need for survival. In these cases, creativity emerges from a pressing need to solve a problem. The second major source of innovation lies in competitiveness. Once a certain level of well-being has been assured, some people have the continuous desire to get on that feeds the initiative to continue innovating.

An innovating company needs *geniuses*, who are the professionals who think up new perspectives, turn the perspectives into ideas and the ideas into innovation. However, it also needs *champions* who will support, encourage and promote innovation, as well as *leaders* in charge of designing the organisation's structures and operations in a way that will encourage innovation.

Regions and countries also have to tap into the potential of the "new Argonauts": entrepreneurs educated abroad who return to their home countries armed with knowledge and a list of global contacts. These Argonauts play an essential role in

expanding knowledge, globalising innovation and developing their home countries. They are the connectors who democratise innovation.

The social networks that drive innovation

Companies are now focusing on specific functions in the value chain and increasingly depend on collaboration with other companies to bring innovative products and services to market. Clusters like Silicon Valley provide a healthy breeding ground for developing that collaboration. Proximity encourages the sort of personal relations and informal conversations that allow ideas to be turned into innovation. Clusters also offer funding through highly developed venture capital markets.

Clusters form a good context for innovation, but they are not the only place it can occur. Improvements in transport and communications allow new companies to access the global market from anywhere in the world. To do this, however, they need to develop the skill of scanning the world for resources and capacities that will complement their own.

Social responsibility in the innovation process

Social innovation requires the collaboration of governments, businesses and non-profit organisations. It requires a commitment by all stakeholders to apply innovative, scalable results-oriented business solutions to resolve the greatest social and environmental problems. In this collaboration, the social entrepreneur plays an essential role as the figure in charge of searching for solutions to the real needs of these people, innovating in order to provide what they are actually asking for, not what others think they need.

The new coordinates of innovation

American companies are still the most innovative, but the times are changing. Globalised communications and transport have simplified international trade and many new companies are now born global, setting up from the outset in the country, community or region that best suits their interests. At the same time, large corporations are dividing their operations up amongst different countries, to take advantage of the best local conditions. Governments from around the world are competing to build the most favourable environment for business and embracing innovation.

Innovation is moving to developing economies. Over the last few decades they have been receiving technology and know-how, and in the process they have learnt a lot. Although copying is still a factor, imitation is giving way to innovation. The skills acquired in the offshoring process are being complemented by government with major investment in R&D and education. The knowledge acquired is being adapted and improved to tackle their main adversities. China and India, with populations of over a billion and low wage levels, are rethinking not only the products, services and distribution systems, but also the business models themselves. Their companies have to deal with large levels of scale, an accelerating rate of change, proactive governments, a growing middle class and new technologies.

Developing countries are becoming innovators in their own right and are ceasing to be merely talented imitators, although the centre of innovation continues to be

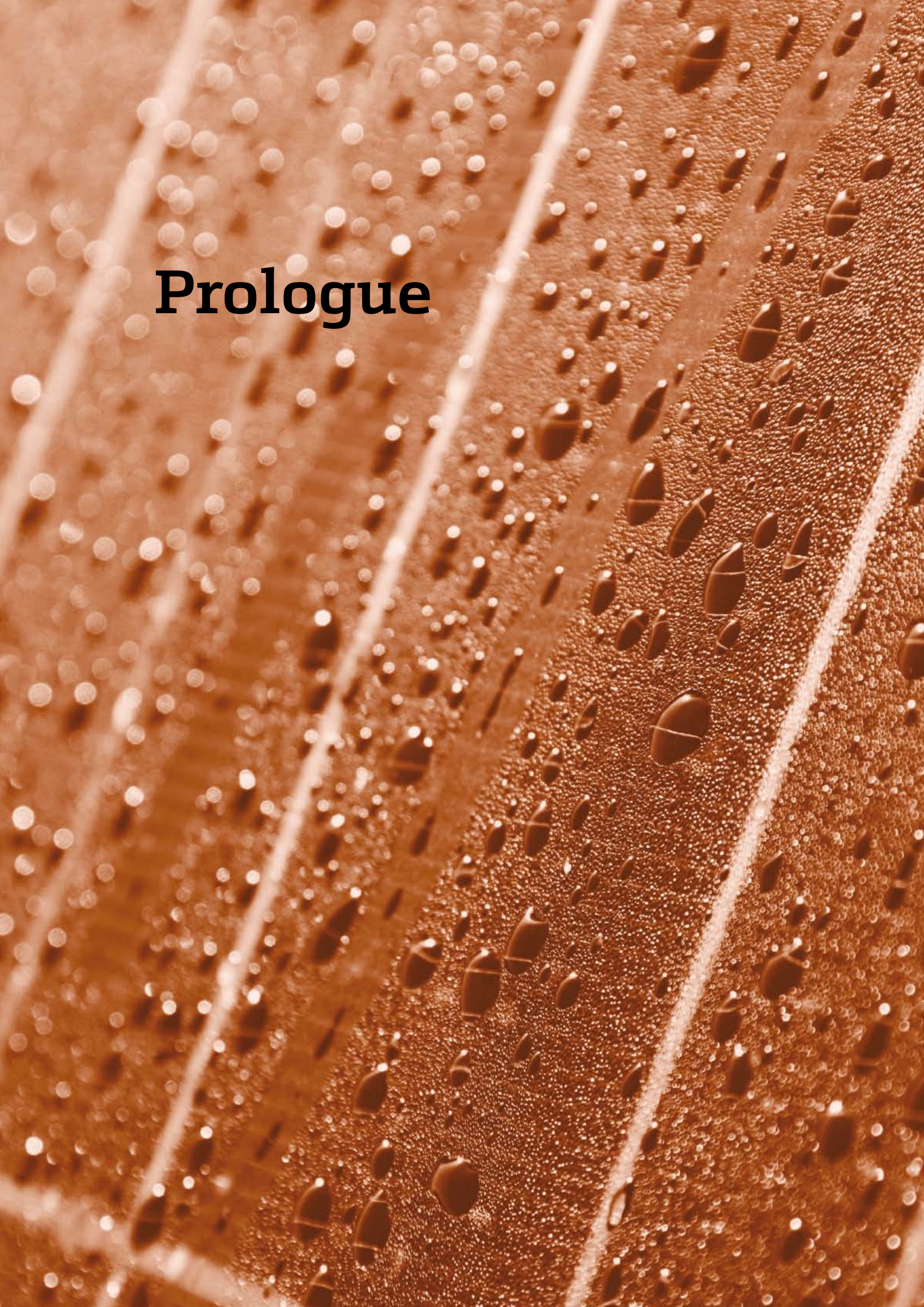
the US and the West still holds great sway. However, the crisis has highlighted the ways in which developed countries hinder innovation. The governments of developing countries have always been accused of being overly interventionist but when it comes to innovation, western governments can do just as much harm. Government leaders appear to be more aware of this and are reacting.

Society is facing strong pressures for change which include globalisation, sustainable development, new technology and demographic change. An innovative policy must recognise and consider such pressures, as well as maintaining a coherent global approach. Countries and regions that respond to these issues will be better prepared to face the future.

Innovation in Spain

Although the position of innovation in Spain has improved in recent years, the country is still in a relatively unfavourable position *vis-à-vis* other more advanced countries.

The government considers innovation to be one of the main axes for growth and has prepared an ambitious agenda in this regard. This plan will have to address the issues raised by the experts, who feel that the investments and innovations made by companies in the ITC industry need to be followed up better. Traditional sectors have great innovating potential and can feed off the knowledge generated in the latest technological areas. It will also have to address other major problems, such as the need for reforms to the education system in order to encourage a culture of effort and entrepreneurship; continuous campaigns on the need for innovation among small companies to ensure that they make the most of tax incentives and reforms to the financial system to allow these companies to grow. The government's response to these and other questions will be crucial in determining Spain's role in the future.



Prologue

This Bankinter Foundation publication on "National and Regional Innovation" is ideally timed. Innovation dominates the agenda for today's leaders. Government officials design policies to encourage innovation and entrepreneurship, corporations need to innovate to stay ahead of competitors in global markets, and non-profit organizations seek innovative solutions to thorny social problems. Even the media is captivated by the promise of innovation – headlines regularly announce new devices or tools that are transforming the way we communicate, work, and even organize our social lives.

This would be no surprise to the Austrian economist, Joseph Schumpeter, who identified innovation as the central driving force of capitalism. Scholars today see Schumpeter as the most important economist of the era, just as the ideas of John Maynard Keynes dominated economic thinking in the 20th century. Keynes was a product of the Great Depression of the 1930s. His models for managing aggregate demand dominated the post-WWII era when the Western economies experienced decades of growth and stability. Government officials believed they had mastered the policy levers needed to manage (or "fine tune") the economy to avoid disruptive business cycles. Innovation was also a managed activity, pursued within the isolated research and development labs of large mass production corporations and the leading research universities, and introduced commercially on a carefully planned schedule.

The global economy in the first decades of the 21st century, by contrast, is turbulent and uncertain. Powerful new nations and competitors have emerged around the world opening up new markets and challenging established nations and firms; information technology is undermining the fundamentals of existing industries, creating entirely new sectors and collapsing the boundaries between others. Schumpeter wrote about this process in the early 1940s as a process "that incessantly revolutionizes the economic structure from within, incessantly destroying the old one, incessantly creating a new one. This process of Creative Destruction is the essential fact about capitalism. It is what capitalism consists in, and what every capitalist concern has got to live in."

Innovation, for Schumpeter, was the domain of risk-taking entrepreneurs; driven by the "entrepreneurial spirit" they were willing to uproot, even revolutionize, existing ways of doing business. He understood innovation broadly to include new technologies or products, new methods or production processes, the opening of new markets or sources of supply, and even novel types of organization or business models. In his words: "in capitalist reality as distinguished from its textbook picture, it is not ... [price] competition which counts but the competition from the new commodity, the new technology, the new source of supply, the new type of organization — competition which commands a decisive cost or quality advantage and which strikes not at the margins of the profits and the outputs of the existing firms but at their foundations and their very lives."

For many, California's Silicon Valley, where the semiconductor industry emerged in the 1970s, epitomizes the Schumpeterian model of entrepreneurial "creative destruction." While entrepreneurial failure is far more common than success in the region, Silicon Valley firms continue to introduce innovative products and services – from the personal computer to the Internet and networking to electronic

commerce, search, and social media – and to disrupt established industries, from news media to publishing to music.

Firms, regions, and nations now recognize that innovation is an imperative. Yet efforts of policymakers around the world to "grow the next Silicon Valley" have all failed. Globalization means that Silicon Valley has a significant first-mover advantage, and state-supported producers can no longer survive as "national champions" in the face of global competition. The latest research suggests that rather than trying to replicate Silicon Valley, policymakers and producers should differentiate their activities based on local capabilities and endowments. Moreover as economic volatility contributes to the vertical fragmentation of production, formerly peripheral regions and producers can now contribute to global supply chains. The firms and regions that succeed in the current environment do not seek to compete head-on, but rather they are places like Israel and Taiwan, that have developed complementary innovations that allow them to connect to customers and suppliers in dynamic regions like Silicon Valley.

While we understand the central importance of innovation and entrepreneurship to economic growth today, we are still learning about how to create the best environments for innovation. This new Bankinter publication offers an insightful overview of the way forward for Spain as well as for other nations and regions.

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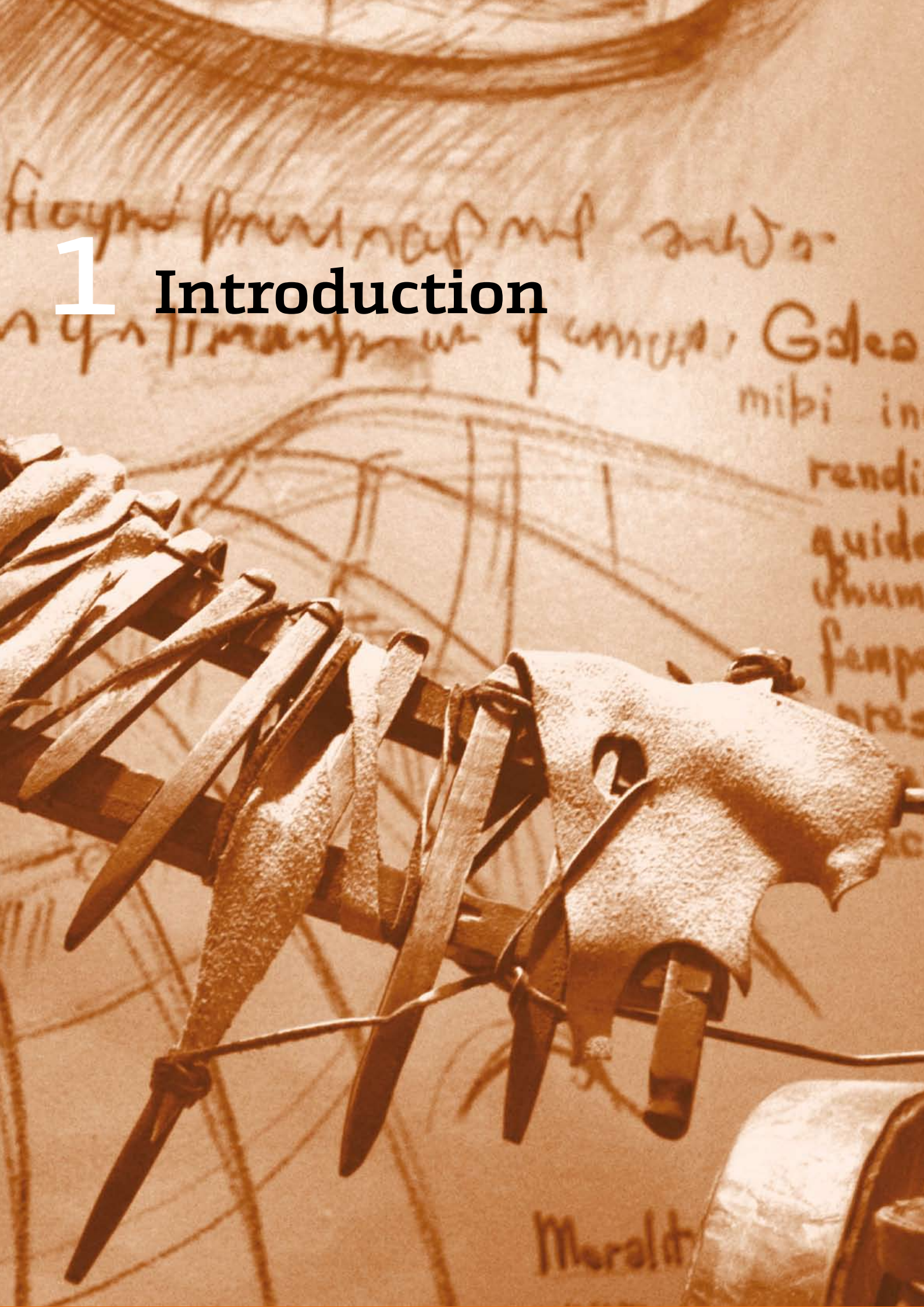


1 Introduction

In a constantly developing world, one of the keys to success is to know how to anticipate change and the possible impact it can have in the medium to long-term future. If we master this knowledge, we can identify and capitalise on future business opportunities. Certain tools are essential in achieving this goal, and these include an analysis of future trends. Bankinter set up its Fundación de la Innovación with a clear objective: to influence the present by looking to the future and to stimulate the creation of business opportunities at the cutting edge of technology and management with a view to promoting innovation in the Spanish business world. It is an ambitious and innovative project, through which Bankinter hopes to foster the creation of business opportunities. The project involves over three hundred international expert opinion leaders from different disciplines, hailing from around the world, and a superb board of trustees. It also seeks to reinforce Bankinter's commitment to society.

The Future Trends Forum (FTF) is the Fundación de la Innovación Bankinter's most important and most fully consolidated project. It is the showcase of Bankinter's culture: innovation and a commitment to development. The FTF is Spain's leading forum for long-term forecasting and innovation and embraces top scientists, academics, businesspeople, entrepreneurs and other leading international intellectuals. It is the only multidisciplinary, multi-industry and international think-tank in Europe. It seeks to convey all the objectivity of a forum enriched by a range of viewpoints, which remains unbiased and unswayed by interests of any kind.

The forum strives to predict the immediate future by detecting the social, economic, scientific and technological trends that are most likely to change the way we live and work, analysing possible scenarios and impacts on current business models in sectors that will be most affected. Based on these deliberations we seek to draw conclusions on the best way of creating wealth out of the situation. These recommendations are intended to be circulated amongst different strategic spheres of society

The Future Trends Forum members themselves can propose issues for discussion and a vote is taken on the ones that will eventually be addressed. The final result comes when the conclusions of this survey of employers, professionals, top management, companies and institutions are circulated. This phase takes the form of this publication and a series of lectures given in all the major cities of Spain.

In this latest publication (in which the primary collaborator has been Accenture) we set out the FTF's conclusions on the main pillars that allow entrepreneurship and innovation to develop in any given region.

We start by describing the essential role played by innovation in developing society. We also offer a practical approach to understanding innovation and some indicators that can be used to quantify it. We identify a number of mistakes in the way innovation is interpreted and show its importance as a long term development strategy.

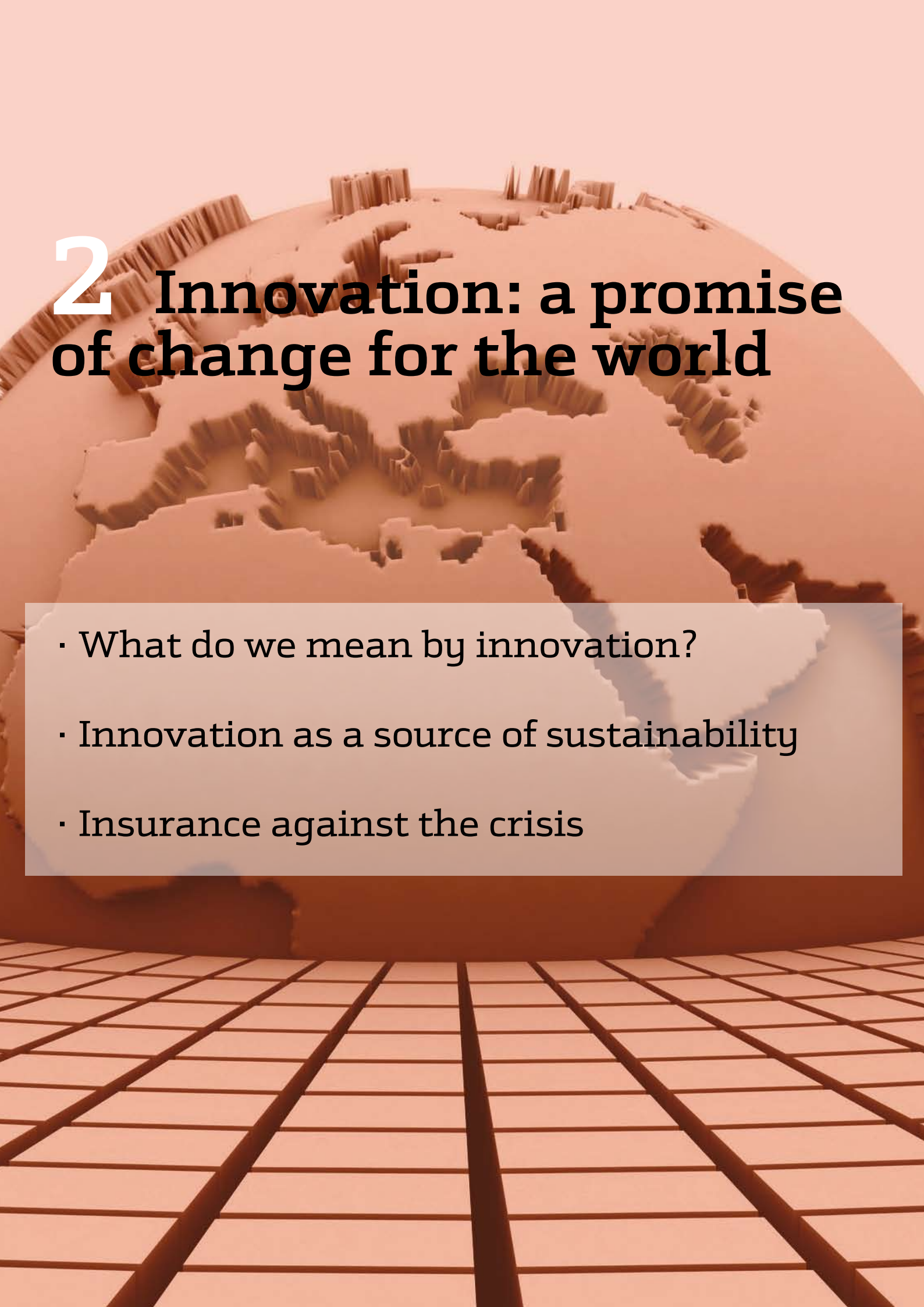
We then go on to analyse the main elements making up the puzzle of innovation and entrepreneurship in a country or region: government, the business community, education, people, social networks and social responsibility. We

describe the impact each element has on the entrepreneurial and innovative culture of the region, offering the main lines of action and setting out a number of representative and successful examples.

We then describe the new coordinates of innovation. We show the greater role being played by developing countries, and the conditions and policies that have led to this transformation. We also analyse innovation in developed countries and the factors that are hindering proper leadership in this area. Finally, we offer a global framework of action for developing an entrepreneurial and innovative ecosystem.

The final part of this publication focuses on the current state of innovation in the Spanish market. This section is based on the principal innovation studies conducted during 2010, particularly by COTEC and Accenture.

Once again, the Fundación de la Innovación Bankinter hopes that this new publication will act as a source of knowledge, but, above all, that it will serve to stimulate and guide professionals and employers from different sectors to harness the advantages and opportunities that may arise in an uncertain economic landscape. More than ever before, companies that know how to understand change and act in consequence will not only manage to stay in the market, but will emerge strengthened from the crisis, ready to benefit from the new wave of growth when it comes.



2 Innovation: a promise of change for the world

- What do we mean by innovation?
- Innovation as a source of sustainability
- Insurance against the crisis

Is innovation the panacea to all our problems? In the current climate of uncertainty, politicians often talk about innovation as if it were the magic formula for overcoming the financial crisis. Yet one might well argue that the financial services sector —where the current crisis started— has been one of the most innovative areas in recent years. Indeed, one might go further and say that it was those financial innovations that caused the problem. And that's not all: nearly a decade before, the development of the Internet and the whole information and communications technology (ICT) industry led to the infamous dotcom bubble.

With two such recent examples, should one really accept a political discourse that sings the praises of innovation? Without wishing to set any precedents, the answer is... yes. It would be difficult to argue that these innovations have not created wealth. The new technologies that began to emerge in the 1990s are now transforming our society. They have benefited not only the developed world, but developing economies too. And once the market stabilises and they are better understood, the new financial products will serve as a vehicle whereby risks can be spread to the best-placed agents can spread their risks. Bubbles and crises are caused not by innovation, but by the effect of that innovation on human behaviour. To qualify somewhat the mood of political enthusiasm, therefore, investment in innovation should be seen as a necessity, but it should be undertaken with patience. Although it may on occasions bring short-term returns, it is essentially a medium- to long-term investment.

Human evolution has been marked by innovation. It is the oxygen of our society. The development of fire, agriculture and democracy are just three examples of great innovations that have changed our history. However, this oxygen operates at an ever increasing rate. Tim Harford, economist and journalist at the *Financial Times*, in his book *The Logic of Life,* compresses the last million years of world history into a single year. In this scenario, the first signs of civilization did not emerge until 19 December. But the most surprising thing is how quickly society has developed and the economy has grown in recent centuries. Around 7.30 pm on 31 December, Columbus discovered America. From that moment until 11:20 pm and the start of the Second World War, the world's economy grew tenfold... in 3 hours and 50 minutes! Yet in the last forty minutes —from the Second World War to the present— the economy has again grown ten times over. How can one explain this growth? In terms of innovation.

Harford uses a model of economic growth developed by Michael Kremer, economist and Harvard professor[1], whereby under the same conditions, anyone has the same chances of thinking up an invention that is useful for society — in other words, of innovating. This model is underpinned by the thesis that new ideas, whether they involve the invention of an axe or a catapult, gradually spread to the rest of society, and thanks to this process of dissemination, society progresses. Harford uses a simple but illustrative example. Assume that on average, for a population of one billion people, someone has a brilliant idea every year. Amongst one million people (the total human population 300,000 years ago), a revolutionary idea will arise every thousand years. The size of the population and the number of ideas are directly proportional. As the population grows, the frequency of great ideas increases. In 1800, with one billion people on earth, there would be one great idea every year. And now, with nearly seven billion inhabitants, a groundbreaking idea should happen every two months.

[1] Michael Kremer, "Population Growth and Technological Change: One Million B.C. To 1990", *The Quarterly Journal of Economics,* vol. 108, n. 3. (Aug., 1993), pp. 681-716.

OECD distinguishes between four types of innovation: product innovation, process innovation, marketing innovation and organisational innovation

We are not going to try to demonstrate the validity of this model. Indeed, it might well be considered too simple to represent a very complex reality. Nonetheless, it serves to reinforce one of the characteristics of innovation that has been highlighted by the FTF experts: that the potential of collective innovation is much greater than that of an individual mind. This is good news in complicated times, when we face major problems that need a quick fix. Now, more than ever before, we need innovation, new solutions, creative proposals and new ways of working. Fortunately, we have nearly seven billion potential innovating minds. Together, they may come up with the solution to these problems.

However, many of these minds are not being utilised. Less than 30% of them have Internet access[2] and billions live below the poverty line. Mobile communications are a major step in the right direction, but there are still many barriers that prevent this sort of joint work. Examples of these barriers include cultural conflicts and trade barriers. Thanks to the dissemination of information, people are aware of the problems and gradually break down these barriers. Governments must help in the process, given that society is endorsing the process of globalisation: Facebook's 500 million users are ample proof of that[3].

Resolving the problems we currently face will require the collaboration, ideas and perspectives of all. Abraham Lincoln said: "The dogmas of the quiet past are inadequate to the stormy present. The occasion is piled high with difficulty, and we must rise with the occasion. As our case is new, so we must think anew, and act anew. We must disenthrall ourselves, and then we shall save our country". Replace "country" by "planet" and his words are as topical as ever.

2.1. What exactly do we mean by innovation?

The concept of innovation has been the subject of vast amounts of research and study. Just search Amazon for book titles containing the word *innovation* and you'll get over forty thousand hits. However, among all these books and all this research, we still don't have a concise definition. One might say that everyone has their own idea of what innovation is. As early as 1934, Joseph Schumpeter defined it as "the process of finding economic applications for inventions"[4], while the Spanish Royal Language Academy defines innovation as the "creation or modification of a product, and its introduction onto a market"[5]. The two definitions differ in their scope, but they both coincide in highlighting the economic function of innovation: in other words, if it does not have an application on the market, it is not innovation.

Human evolution has always been linked to innovation. Typically innovations mentioned in the literature that have changed the course of human history include the Internet, the automobile and even the wheel. As a result of such examples, innovation is often associated exclusively with technology. It is, however, a much broader concept, encompassing management concepts such as Just-in-time and new financial products. The OECD defines innovation as "the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organisational method in business practices, workplace organisation or external relations"[6]. This has become the standard definition, accepted by OECD member states. It distinguishes between four types of innovation:

- **Product Innovation**, defined as a good or service that is new or significantly improved.

[2] http://www.internetworldstats.com/stats.htm.

[3] http://www.facebook.com/press/info.php?timeline.

[4] J.A. Schumpeter, *The theory of economic development,* Harvard University Press, 1934.

[5] www.rae.es.

[6] OECD Publishing, *The Measurement of Scientific and Technological Activities. Oslo Manual: Guidelines for Collecting and Interpreting Innovation Data: Oslo Manual,* Paris, 2005 (3rd edition).

- **Process innovation**, the implementation of a new or significantly improved production or delivery method.

- **Marketing innovation**, the implementation of a new marketing method involving significant changes in product design or packaging, product placement, product promotion or pricing.

- **Organisational innovation**, the implementation of a new organisational method in business practices, workplace organisation or external relations.

In fact, even these definitions do not cover the full scope of innovation. For example, would one classify political or educational innovation, or innovation in business models?[7] Trying to pigeonhole innovation in a precise definition is a difficult and ultimately largely unnecessary task. We do not need an exact definition of innovation since we can recognise it the moment we run into it. However, it is important to note that innovation does not consist merely of research and development (R&D) or in scientific discovery. Many countries continue to measure innovation as total spending on R&D, patent applications or scientific articles published. These indicators are used because they are easy to calculate, but they do not reflect true innovation. A successful patent application which never gets marketed is not an innovation. The same is true of R&D. If you fail to obtain a product or service that is a success on the market, the money you have invested in R&D is not innovation, it is an expense.

NESTA (The National Endowment for Science, Technology and the Arts), an independent British foundation, defines innovation in areas unrelated to traditional indicators as "hidden innovation"[8]. Most governments do not measure this innovation, even though it is the kind that contributes most directly to the performance of an industry. It can range from a whole new organisational system to some small variation in an existing product. Peter Nicholson, former president and CEO of the Council of Canadian Academies and an FTF expert, considers that innovation in a country must be measured in its broadest sense. Companies can use survey-based tools to measure innovation, such as KEYS®[9], which assesses the climate for creativity and innovation in an organisation. However, there are no such tools available for whole countries. Nicholson therefore considers that the best measure of innovation over a long timescale may be multifactor productivity (MFP). This indicator, already familiar in economics, looks at the "intelligence" with which capital and labour are employed. Nicholson defines it as that part of GDP per hour that cannot be explained by the intensity of capital nor by the quality of the workforce. This indicator does not tell a government whether the innovation is technological, financial or of some other type. MFP measures overall innovation and ultimately it is not important for a government to know in what sector the innovation originates. The important thing is that the country as a whole is innovating.

What innovation is not

As we have already said, one of the principal mistakes when referring to innovation is to associate it univocally to technological advances. New technologies are innovations, certainly, but the concept of innovation goes far further. Let's take a recent example: the Internet. The World Wide Web has led to an unparalleled burst of innovation. In this perspective, the innovation ushered in

[7] The Boston Consulting Group, *Business Model Innovation: When the Game Gets Tough, Change the Game*, December 2009.

[8] NESTA, *Hidden Innovation: How innovation happens in six 'low innovation' sectors*, June 2007.

[9] http://www.appliedinnovation.com.au/Consulting/KeysCreativityInnovationSurvey/tabid/67/language/en-AU/Default.aspx.

by the Internet consisted of the digitisation of information and its transfer from computer to computer using the TCP/IP protocol and the charging a fee for the service. Clearly, there is more to it than that. What about Google, Facebook, Twitter, Skype, YouTube and eBay? These are new Internet-based business models, new marketing strategies, new distribution channels, etc. It's all innovation, but it's not necessarily technological innovation.

Another common mistake is to confuse innovation and *invention*. The common factor in the definitions above is the commercial applicability of innovation. Inventions can come from laboratories, universities, garages or even from the felicitous brainwave of a gifted brain. However, if these inventions do not generate wealth, they are not innovations. Figures on R&D spending, patents and scientific publications measure invention rather than innovation. Between an invention and an innovation there is a "Darwinian Sea" (See Illustration 1); in other words, the original invention has to undergo constant development in order to survive in the "wild state" of the business world.

"Only small or new companies innovate". This is a very widely held view of where innovation originates, but it is an incomplete one. The great majority of small companies are forced to innovate. They stand at a disadvantage compared to large companies, and have to come up with new ways of competing. On other occasions, one or more people may come up with a new product or business concept and create a new company to put it into practise. Indeed, many of today's large organisations started out as small innovative companies (one of the best examples is General Electric, originally founded by Thomas Edison[10]). New companies are essential in innovation. For this reason, the FTF experts consider the number of start-ups created to be an essential indicator of a country's level of innovation. However, the fact that small companies innovate does not mean that big companies do not. Indeed, Apple, General Electric and Microsoft are among the world's leading innovators. The R&D investments of these big corporations dwarf the budgets of the small companies. The issue is not that the big companies do not innovate, but that they do not utilise their entire potential for innovation. Why limit innovation to the hundreds of

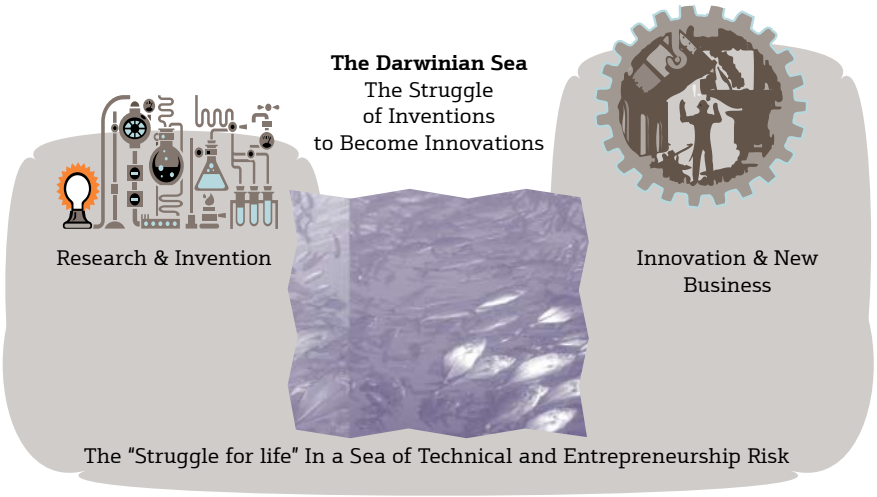


Illustration 1: Metaphor for the invention-to-innovation transition: the Darwinian Sea.
Source: National Institute of Standards and Technology.

[10] http://www.ge.com/company/history/index.html.

Source: Illustrations resuming Future Trends Forum's presentations.

researchers in the R&D department when you have thousands of potential innovating minds?

This confusion arises not only among companies, but also among countries. If you think developed countries are the only ones that innovate, you are out of touch. As we shall see throughout this report, the coordinates of innovation are changing and developing countries such as India, China and Brazil are taking immense strides down the road of innovation. If you start from the premise that everyone is a potential innovator, you only have to look at the world population to imagine where most future innovation is likely to come from (see Illustration 2). China and India have a combined population of over 2.4 billion. Just imagine the potential of these countries as Internet and mobile phone use become spreads!

Another common mistake is to think that innovation consists only of the sort of breakthroughs that transform the market overnight. This is not an accurate picture. Firstly, innovation consists of both groundbreaking innovations and small changes in existing situations. And secondly, groundbreaking innovation does not change people's habits overnight, but instead requires a period of adaptation. Facebook is a good example. Its short history consists of a groundbreaking innovation –the launch of a social network on the Internet– and a combination of many small innovations made up of small applications that improve the user's experience[11]. Facebook has certainly changed the market, but even one of the fastest-growing phenomena in history, was confined to university spheres for over a year and a half.

Finally, innovation should not be seen as the result of the ideas of great minds or individual brainwaves. Certainly, great innovations can arise from those moments, but most innovation comes from group intelligence. To return to the example of

[11] http://www.facebook.com/press/info.php?statistics#!/press/info.php?timeline.

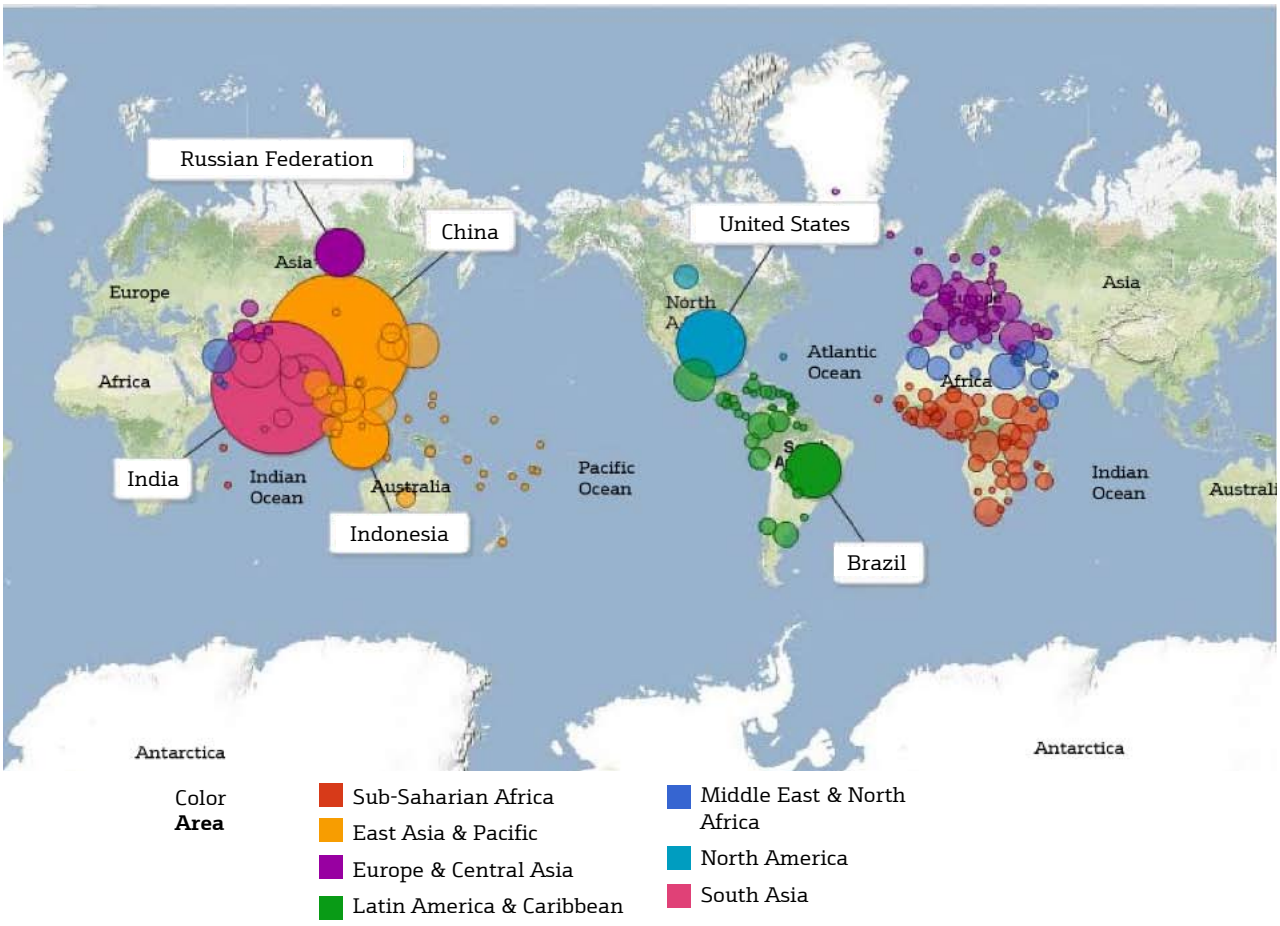


Illustration 2: Distribution of world population in 2008.
Source: Google.

Facebook, the idea arose out of a single genius moment on the part of its founder, Mark Zuckerberg, but what Facebook has now become is the result of the contribution of thousands of users who have used the platform to create new applications.

In short, we should not try to define innovation since we would restrict it. What we must do is understand the pillars on which innovation is built and strengthen them. The problem is similar to that of the fundamental particles in physics. What is an electron? We don't know. That little ball depicted circling the nucleus of an atom is simply a representation. And yet we do not need to know. It is enough to know the properties and behaviour of the electron, to build the pillars of physics. The same is true of innovation. We don't know what it is, but if we know its properties and its functioning we will be able to build the pillars of the modern economy.

2.2. Cultivating innovation as source of sustainability

A study by the strategic consultants The Boston Consulting Group shows that after a short pause in 2009, in 2010 innovation is once again a strategic priority for 72% of companies surveyed[12]. Most senior managers questioned said they were

[12] Innovation 2010: A return to prominence – and the emergence of a new world order.

satisfied with the return on their investment in innovation. However, opinions were different among other employees, with only 36% satisfied with the results. These figures aptly illuminate one of the problems of innovation: today's business leaders are not fighting in terms of their commitment to innovation, but their capacity to implement the innovation initiatives effectively.

Politicians and senior executives are happy to promote innovation, seeing it as a way of achieving sustainability. However, if there is one thing that characterises innovation, it is uncertainty. Innovating means newness and all new things are uncertain. Can a new idea be translated into a product or service? Will that product or service be accepted by the market? These questions are inherent to innovation and it is impossible to know the answer until the resources have been invested. The launch of a new product may be backed by a carefully thought-out strategy and yet fail. However, this should not discourage the innovating initiative. Leaders have to learn to manage this uncertainty. They need to follow the strategy of the venture capital industry, i.e. to invest in many different projects, assuming that the positive results of a few will offset losses in the remainder. This system requires method, experience and rigour. The venture capital industry is profitable and companies' innovation process can be successful too.

However, innovation does not emerge without the right culture. An innovating culture must tolerate failure. Stigmatising error puts a brake on innovation. The potential social cost of launching something new makes the risk too great and innovation is confined to the brave few or those in dire straits. On the contrary, a culture that tolerates mistakes encourages entrepreneurship and innovation. The possible outcome of any new initiative is not all or nothing, innovation or failure. Innovation is a learning process and, even if the economic results are poor, the human capital will have been strengthened. Venture capital firms evaluate the entrepreneurial record of those asking for funds, knowing that, like any other area, entrepreneurship and innovation require learning and experience. How can you learn to walk if you are not prepared to fall?

Tilling the land for innovation

Like society itself, the concept of innovation has gradually evolved. Post-war corporations saw it as a linear process. Large firms were expected to internalize many steps of the process and corporate research centers —set at a distance from the central offices— were the source of new products, which were subsequently launched on the market by way of the company's other structures[13]. This was essentially an industrial model of innovation.

This model has changed. Innovation is no longer seen as something separate. It can arise from anywhere in an extended organisation, including not only the employees themselves but all stakeholders. What was previously equivalent to a conveyor belt in an industrial plant, in which ideas emerged within R&D laboratories and followed a standardised process of production and marketing, has now become a field of crops. Innovation is not a linear process, but an organic one. The industrial model has given way to an agricultural one. Innovation has to be seen as a crop, taking in the whole organisation. The important thing is to make sure the land is fertile and create the right conditions for ideas to germinate. And those that do sprout need the resources that will enable them to grow and develop. Innovation can neither be predicted nor forced. The only thing that can be done is to plough the soil, fertilise and irrigate

[13] Jung Won Sonn and Michael Storper, «The Increasing Importance of Geographical Proximity in Technological Innovation: An Analysis of U.S. Patent Citations, 1975-1997». http://www.sppsr.ucla.edu/up/webfiles/storperpaper1.pdf.

Innovation requires staff and financing, as well as resources that are plentiful in the boom years, but scarce in times of crisis

it properly. With these conditions and a bit of luck, it is possible to get a good harvest.

Innovation depends on numerous different factors. We do not know all the factors that led to the creation of Silicon Valley but that is not necessary to draw up an innovation agenda. Why? Because in all likelihood they involved both premeditated action and simple coincidence. Even if we ignore the role of chance in its formation, replicating the same conditions somewhere else in the world would be as difficult as it would be unnecessary. Why build another Silicon Valley when one already exists? Innovating consists of creating value through something new, not in replicating something that already exists. What innovation centres do offer are references from which to draw the necessary conditions for innovation can be obtained. In later sections, we will describe the most important elements of innovation, but they all revolve around one single element... people.

Ultimately, it is people who determine innovation. Either as leaders, managers or entrepreneurs, they hold the key to innovation. Artificial intelligence is still no more than science fiction. It is true that technologies enable certain tasks to be performed more efficiently, provided they are programmed by people. Machines do not think, they only execute, and for innovation you need to think. However, it is important to remember that whereas innovation originates among people, it develops in the business environment. A company is a group of inter-relating people with different skills. It is these people and the relations established between them that determine innovation in a company.

Companies are comprised of two types of assets: tangible and intangible. Whereas tangible assets are reflected in the balance sheet, most intangible assets are not. However, it is they that to a great extent determine a firm's value. Are shares in Coca-Cola the same as their book value? Obviously not[14]. Coca-Cola's accounts statements do not include one of its most important assets, its brand. And accounting standards do not include a company's capacity to innovate. How much is a start-up worth when it begins operating? Judging by the book value, very little; yet if we measure it in terms of its capacity for innovation, it may be worth much more. Think what you would have paid for shares of Google when it started up if you'd known how the business was going to develop. The comparison is not entirely valid, but one might say that the tangible assets are business-as-usual, whereas the intangible assets are the equivalent of innovation. Part of the value of a company can be explained by its current lines of business, products and services, which make up its short-term source of income. However, the other part of its worth cannot be explained in terms of the existing product portfolio, but instead depends on anticipated future earnings. In most cases, the competition reduces the margins and the products and services on offer are not enough to sustain the company's earnings. It needs new things. It needs innovation.

Preparing for hard times

One common mistake among business and government in the years prior to the current crisis was their failure to prepare for the bad times. This complacency was a consequence of the strong growth that preceded the crisis. Earnings from traditional lines of business took the spotlight off the importance of innovation. However, sustainability requires innovation, a maxim that was ignored until the crisis was well underway.

[14] On 2 July 2010, the book value per share was €5.25. http://finance.yahoo.com/q/ks?s=KO.

Innovation, as we have said, is a medium or long-term investment. It requires staff and financing, as well as resources that are plentiful in the boom years, but scarce in times of crisis. Because of this, it is important to encourage innovation in growth periods as the only way to maintain growth. Organisations that have worked like this – such as large hi-tech firms– are at an advantage. Illustration 3 shows the short-term financial liquidity and investments of the large hi-tech companies. This money is available for investing in new opportunities, created either internally or through acquisitions. You only have to compare their situation with that of the real state of financial sector to see the differences.

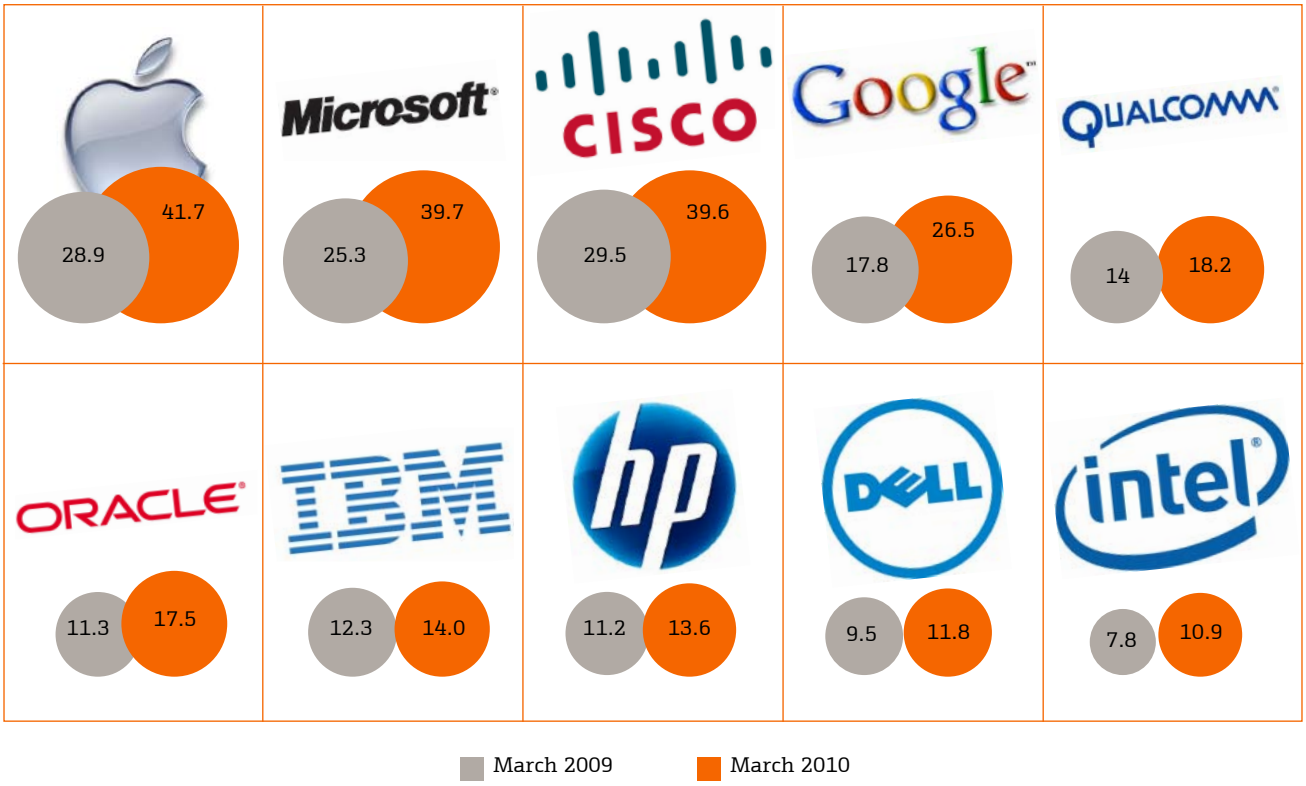


Illustration 3: Tech companies' cash and marketable securities (billions of dollars).
Source: Financial Times.

Something similar has happened at a national level. The large developing economies, such as China, India and Brazil, invested intensely in infrastructures, technology, education and R&D during the economic bonanza. In contrast, countries like Italy and Spain enjoyed the boom without keeping an eye on maintaining their future position. Illustration 4 shows how they operated during the crisis. Whereas the EU economy dropped 4.1% in 2009 and in 2010 is fighting to stay in the black (projected growth of 1%), China and India grew by 8.7% and 5.7% respectively in 2009, and in 2010 they are already back at their pre-crisis levels of 10% and 8.8%.

	Year over Year						Q4 over Q4		
			Projections		Difference from Juanuary 2010 WEO Projections		Esti-mates 2009	Projections	
	2008	2009	2010	2011	2010	2011		2010	2011
World Output[1]	3.0	−0.6	4.2	4.3	0.3	0.0	1.7	3,9	4.5
Advanced Economies	0.5	−3.2	2.3	2.4	0.2	0.0	−0.5	1.2	2.5
United States	0.4	−2.4	3.1	2.6	0.4	0.2	0.1	2.8	2.4
Euro Area	0.6	-4.1	1.0	1.5	0.0	−0.1	−2.2	1.2	1.8
Germany	1.2	−5.0	1.2	1.7	−0.3	−0.2	−2.4	1.2	2.1
France	0.3	−2.2	1.5	1.8	0.1	0.1	−0.3	1.5	1.9
Italy	−1.3	−5.0	0.8	1.2	−0.2	−0.1	-3.0	1.4	1.3
Spain	0.9	−3.6	−0.4	0.9	0.2	0.0	−3.1	−0.1	1.8
Japan	−1.2	−5.2	1.9	2.0	0.2	−0.2	−1.4	1.6	2.3
United Kingdom	0.5	−4.9	1.3	2.5	0.0	−0.2	−3.1	2.3	2.6
Canada	0.4	−2.6	3.1	3.2	0.5	−0.4	−1.2	3.4	3.3
Other Advanced Economies	1.7	−1.1	3.7	3.9	0.4	0.3	3.2	2.8	4.4
Newly Industrialized Asían Economies	1.8	−0.9	5.2	4.9	0.4	0.2	6.1	3.4	5.9
Emerging and Developing Economies[2]	6.1	2.4	6.3	6.5	0.3	0.2	5.2	6.3	7.3
Central and Eastern Europe	3.0	−3.7	2.8	3.4	0.8	−0.3	1.9	1.3	4.1
Commonwealth of Independent States	5.5	−6.6	4.0	3.6	0.2	...	...	...	...
Russia	5.6	−7.9	4.0	3.3	0.4	−0.1	−3.8	1.7	4.2
Excluding Russia	5.3	−3.5	3.9	4.5	−0.4	−0.6	...	...	...
Developing Asia	7.9	6.6	8.7	8.7	0.3	0.3	8.6	8.9	9.1
China	9.6	8.7	10.0	9.9	0.0	0.2	10.7	9.4	10.1
India	7.3	5.7	8.8	8.4	1.1	9.6	6.0	10.9	8.2
ASEAN-5[3]	4.7	1.7	5.4	5.6	0.7	0.3	5.0	4.2	6.2
Middle East and North Africa	5.1	2.4	4.5	4.8	0.0	0.1	...	...	...
Sub-Saharan Africa	5.1	2.1	4.7	5.9	0.4	O.4	...	...	...
Western Hemisphere	4.3	−1.8	4.0	4.0	0.3	0.2	...	...	...
Brazil	5.1	−0.2	5.5	4.1	0.8	0.4	4.3	4.2	4.2
Mexico	1.5	−6.5	4.2	4.5	0.2	−0.2	−2.4	2.3	55
Memorandum									
European Union	0.9	−4.1	1.0	1.8	0.0	−0.1	−2.2	1.3	2.0
World Growth Based on Market Exchange Ratios	1.8	−2.0	3.2	3.4	0.2	0.0	...	...	...

Note: Real effective exchange rates are assumed to remain constant at the levels prevailing during February 23–March 23, 2010. Country weigths used to construct aggregate growth rates for groups of economies were revised. When economies are not listed alphabetically, they are ordered on the basis of economic size.

[1] The quarterly estimates and projections account for 90 percent of the world purchasing-power-parity weights.

[2] The quarterly estimates and projections account for approximately 77 percent of the emerging and developing economies.

[3] Indonesia, Malaysia, Philippines, Thailand and Vietnam.

Illustration 4: Overview of the World Economic Outlook Projections (Percent change, unless otherwise noted).
Source: International Monetary Fund.

As these figures show, promoting innovation at times of growth, when the necessary resources and time are available, is the recipe for facing up to recessionary times in the best conditions. Nonetheless, on occasions a crisis can be precisely the event that promotes improvement, given that it is never easy to cull the bureaucratic and non-productive elements that limit innovation in a country or in a company. Who would dare to bring in labour reform at a time of economic growth? Who cares about the cost of setting up a company when there is plenty of employment with existing ones? It is precisely at times of adversity that any such barriers can be torn down. The UK is a clear example. The recession of the 1980s led to a culling of the least productive industrial firms, a reduction in the power of the trade unions, the privatisation of state-owned companies and the creation of more flexible markets for work and capital. These reforms fostered an entrepreneurial spirit and a more business-oriented culture, laying the foundations for a boom in the economy over the following decades. However, they also had a major social cost, with unemployment rising to three million[15].

The crisis has highlighted the importance of innovation for the sustainability of companies and of society itself. Government and business must make innovation a permanent item on their agendas. The collapse of the American automobile industry shows that innovation is not a production line that can be started up and left to run, but a crop that needs to be tended year in year out. Innovation is our best hope for tackling social problems and driving the engine of economic prosperity. It is, however, only a hope, and prosperity is not assured. Scientific and technological advances can improve the life of vast segments of the world's population, but only if they are turned into concrete solutions; only through action can ideas become innovations. In short, innovation is our best opportunity and that is why institutions have to take proactive measures that will foster innovation in such a way as to resolve present and future challenges. Without innovation, we will be putting a brake on the development of society.

[15] http://www.bized.co.uk/dataserv/chron/kf80.htm.

3 The pieces making up the puzzle of national innovation

- The government's role in innovation
- Designing an innovation-friendly environment
- Innovating culture: a precondition for success
- People and innovation: the new Argonauts
- The role of innovation and solidarity

> "What we need is an entrepreneurial society in which innovation and entrepreneurship are normal, steady and continual."
>
> Peter Drucker[14].

Innovation is the key to growth and competitiveness in a modern economy. The big problems of today's society, such as poverty and climate change, have yet to be resolved, and solving them requires innovation. Moreover, in an increasingly globalised society, the differences among different regions are becoming blurred and only continued innovation can provide a competitive edge. This is what has put innovation at the top of most governments' agendas, but the people in charge face a major challenge. The FTF experts agree that there are no universal recipes for preparing a national innovation agenda. The key factors that have helped innovation prosper in one region probably won't work in another. The experts have identified a number of ingredients that are necessary for innovation — but that is all they are, ingredients. The success of the dish depends on the skill of the chef and his assistants, but, unfortunately there is no Mrs Beeton to turn to in the field of innovation.

When it comes to setting out their agendas, governments face the uncertainty intrinsic to innovation itself. Even a properly developed and marketed business idea is not guaranteed to be a success. And in the same way, a well-devised innovation agenda may not provide the anticipated results. However, there is no other option. Firms and governments both have to take the plunge. Innovation does not ensure success, but a lack of innovation does ensure failure. We therefore examine in the following sections the various pieces that the FTF experts consider necessary (though not enough in themselves!) when putting together the puzzle of innovation. Unlike a traditional jigsaw, these pieces do not match a predefined mould; it is up to the public and private sector to determine their size and shape. This requires a comprehensive all-embracing approach, so that each and every one of them fits in the regional puzzle.

Each of the sections below examines one of the six major pieces of innovation (see Illustration 5):

- **The administration and the government** are responsible for defining the policies and laws that will pave the way for business in the innovation process. Their function is to remove the barriers to sustainable innovation, although on occasions they may have to kick start the process.

- **Companies** are the scenario of innovation. The leaders must introduce an innovating culture that encourages ideas and innovation. To achieve this, they need to adapt their structures and procedures to the new situation, creating a dynamic organisation which can adapt to today's society.

- **The educational system** is where the foundations of innovation are laid. Schools and universities are the laboratories in which entrepreneurs learn the principles of innovation in a safe environment. The new society requires a type of education that rewards all the different talents and aspirations, but above all one that views failure as a form of apprenticeship and not as a capital sin.

[14] Peter F. Drucker, *The Essential Drucker.*

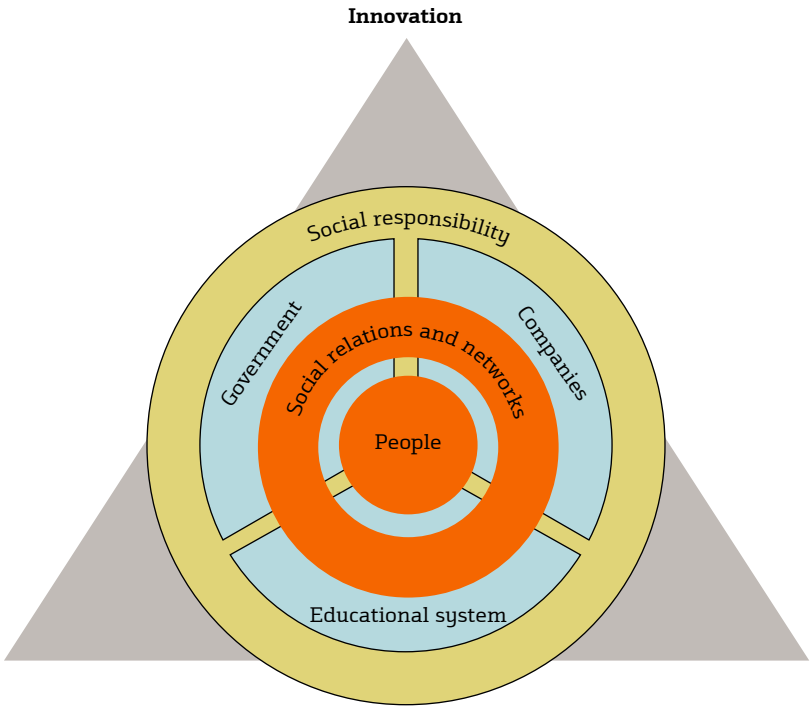


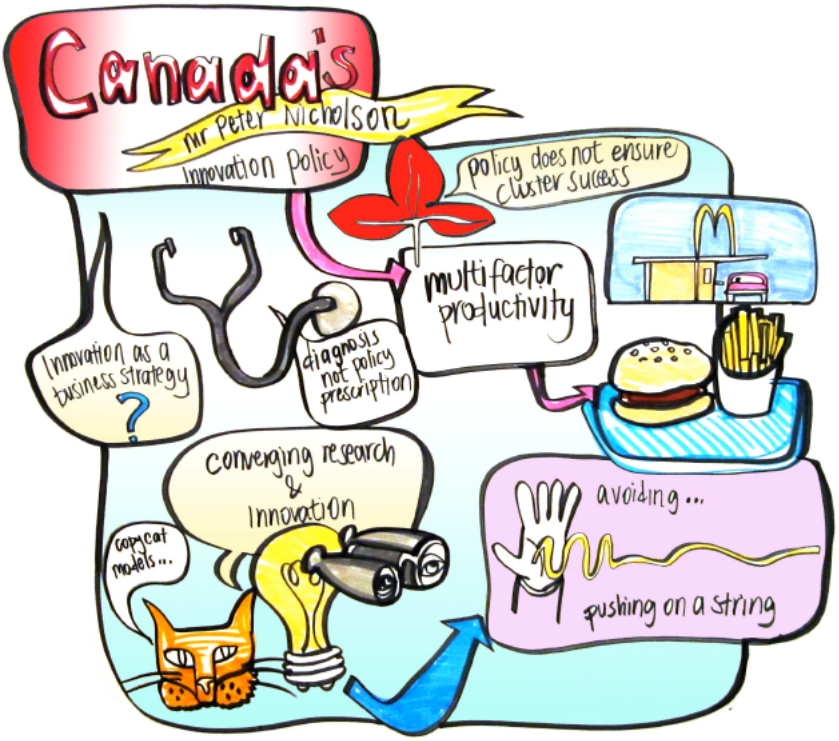
Illustration 5: The innovation framework. The six major pieces of innovation.
Source: Prepared by the authors.

- **People** are the centre of innovation. It is from them that the ideas, motivations and ambitions that lead to innovation spring. Everything else must revolve around people. Each person is different. Creative staff, leaders, management, entrepreneurs... they all have a role to play in innovation and they are all important.

- **Social relations and networks** are the element that unites the diversity of people to make innovation possible. These are professional and personal links that make it possible to align all the different components (ideas, capacities and funding) in innovation management.

- **Social responsibility** allows for a type of innovation which the market tends to forget. Social innovation does not offer economic benefits for companies, but it does generate social benefits. Governments, business and non-profit organisations need to join forces in an attempt to innovate if they want to solve the world's greatest problems.

These are the big pieces making up the puzzle of innovation. Each of them, in turn, may be divided up into several more pieces; however, using these six large ones it is possible to draw up a general framework to shape an innovation agenda. Government administrations need to design each piece considering the region as a whole, but, above all, respecting one basic principle: the sustainable innovation of a region does not depend on its policies or institutions, but on its companies. It is business, not regions or countries, that is the source of wealth. Innovation by the administration cannot be sustained over time. Only with innovative companies can a region address the challenges of the future.



Source: Illustrations resuming Future Trends Forum's presentations.

3.1. Waxing the surfboard: the government's role in innovation

Innovation is all the rage in politics at the moment. Interest among governments has increased in recent years and this process was further heightened during the recession. The cause of innovation, traditionally associated with the private sector, has now been taken up by government, who like to lay out their innovation strategies and talk proudly about increases in the ratio of GDP spent on research and development. Are government officials really the best people to be leading innovation though? Even among the FTF experts there is no consensus as to the best policies for encouraging innovation. Where they do appear to agree is that (to use the analogy employed by Peter Nicholson, former president and CEO of the Council of Canadian Academies and FTF expert) "the role of government is to wax the surfboard, but business really has to catch the wave". In other words, governments have to clear the way for entrepreneurs and businesses, but it is the latter who will ultimately determine a country's innovating capacity. Government therefore has a very important role, but as we shall see in the following sections, it is not the only factor that has to be taken into account when studying innovation.

The traditional approach to quantifying innovation in a country has been to measure parameters such as the number of patents per million inhabitants, publications in scientific journals and spending on R&D. While many governments continue to base their innovation strategies on these parameters, the great majority of reports on innovation widen the concept using parameters that reflect innovation on developing markets and the effects of innovation on social wellbeing. Illustration 6 shows the fifteen most innovating countries, according to a range of studies conducted in 2009 and 2010. Despite differences both in the

Doing Business With		Report	Global Innovation Index Survey 2009-2010	Global Competitiveness Report 2009-2010 (Innovation)	The Innovation Imperative in Manufacturing. How the United States can restore its edge (March 2009)	The Atlantic Century Benchmarking EU and US Innovation and Competitiveness (February 2009)
		No. Of countries	132	133	110	36 countries and the 4 regions of NAFTA EU-15, EU-10 & EU-25
1	Singapore	1	Iceland	United States	Singapore	Singapore
2	New Zealand	2	Sweeden	Switzerland	South Korea	Sweden
3	Hong Kong, China	3	Hong Kong	Finland	Switzerland	Luxembourg
4	United States	4	Switzerland	Japan	Iceland	Denmark
5	United Kingdom	5	Denmark	Sweden	Ireland	South Korea
6	Denmark	6	Finland	Taiwan	Hong Kong	United States
7	Ireland	7	Singapore	Germany	Finland	Finland
8	Canada	8	Netherlands	Singapore	United States	United Kingdom
9	Australia	9	New Zealand	Israel	Japan	Japan
10	Norway	10	Norway	Denmark	Sweden	Netherlands
11	Georgia	11	United States	South Korea	Denmark	France
12	Thailand	12	Canada	Canada	Netherlands	Ireland
13	Saudi Arabia	13	Japan	Netherlands	Luxembourg	Belgium
14	Iceland	14	United Kingdom	Belgium	Canada	Germany
15	Japan	15	Luxembourg	United Kingdom	United Kingdom	Canada

Illustration 6: Most innovative countries according to four different studies.
Source: The four studies shown in the foreground.
* The study distinguishes between twelve pillars that determine a country's competitiveness. Innovation is just one of the pillars and the rank shown in the table reflects the countries' classification solely in the area of innovation.

method used to quantify innovation and the timeframe of the four studies, the graph shows that their results are consistent: nine countries are listed among the fifteen most innovative in all four reports (Sweden, Denmark, Finland, Singapore, the Netherlands, USA, Canada, Japan and the United Kingdom), and the same is true of a further three countries in at least three of the reports (Switzerland, South Korea and Luxembourg).

The World Bank's report *Doing Business 2010*[17], which focuses on the regulation faced by business, provides additional information on factors affecting innovation. The report looks at the ease of setting up a business in the 183 countries surveyed. Illustration 7 shows the ten best positioned countries in the report, nine of which are among the fifteen most innovative countries in at least one of the studies in

[17] World Bank, *Doing Business 2010*.

2010 Rank	2009 Rank	Economy	2010 reforms
1	1	Singapore	3
2	2	New Zealand	0
3	3	Hong Kong, China	3
4	4	United States	0
5	6	United Kingdom	2
6	5	Denmark	0
7	7	Ireland	1
8	8	Canada	0
9	9	Australia	0
10	10	Norway	1

Illustration 7: Top 10 countries in the *Doing Business* report.
Source: World Bank, *Doing Business 2010.*

Illustration 5 (Singapore, USA, United Kingdom, Denmark and Canada are amongst the fifteen most innovative countries in all four studies).

This is not a cause-and-effect relationship, but the regulatory environment can influence the way in which companies take up new business opportunities. Wherever the regulation is transparent and efficient, it is easier for companies to re-orientate their businesses and entrepreneurs to create new companies. To return to the surfing analogy, governments cannot create the waves, which are unpredictable, but they can create the right conditions so that there are surfers in the water ready to take up the opportunity when the waves do appear.

Designing more attractive beaches: indirectly encouraging innovation

In surf, like any other sport, the more attractive the surroundings, the more people will want to join in. The same is true of the sport of innovation. The government has to promote attractive innovation and entrepreneurs and companies will answer the call. Where should we start? A good starting point would be the recommendations of FTF expert Dan Isenberg, Professor of Management Practice at Babson College and founder of its Entrepreneurship Ecosystem Project and FTF expert. The close relationship between entrepreneurship and innovation makes his recommendations a good basis both for creating an entrepreneurial ecosystem and for bringing about an innovating ecosystem[18].

Mention innovation and people tend to think of Silicon Valley. This famous Californian business cluster is a perfect example. Giants like Intel, Apple, Google and eBay were all born there. But Silicon Valley is only an example, not a model. Indeed, there are no models for innovation. From the "valley", we can learn some inescapable conditions for an ecosystem to flourish, but ultimately how it develops will depend on local conditions. These conditions constitute much of the difficulty and they are the reason why there is only one Silicon Valley. For example, does it make sense to encourage semiconductor innovation in Rwanda? Governments have to identify the sectors with potential in their countries and focus their efforts on them. One way of identifying the best sectors is to focus on the adversities faced by the country or region. As Larry

[18] Dan Isenberg, "How to start an Entrepreneurial Revolution", *Harvard Business Review.*

All businesses will benefit from policies that cut overheads, such as tax and energy costs

Keeley, CEO of the Doblin group and FTF expert, explains, Finland is a key reference point in the area of lighting. Its success in this field is due to the fact that during the winter months the country is plunged into darkness for all but a few hours a day.

Governments should not set out alone on this path, given that they will not be able to travel far down it alone. An innovative ecosystem needs the private sector and the government must manage to bring it on board right from the outset. Local companies and expats, who have prospered outside the region, constitute a basic source of know-how. In particular, they have an important understanding of the hidden obstacles to innovation in the country. It is also very helpful to have an existing success story, since it stimulates the entrepreneurial spirit by reducing the perception of risk and barriers to innovation. Governments cannot create success, but they can publicise it when it does happen. Two ways of making these success stories better known are to give them coverage in the media and to award prizes in the field. Nor should governments try to create clusters; instead they should help them grow. These clusters may be the result of the specific policies of a region (such as reduced bureaucracy and lower taxes) but they can also be caused by external factors, such as a suitable climate or simple coincidence. Regional policies should focus on preparing the ground for existing or emerging ecosystems, not on creating clusters through state initiative.

If we assume that innovation has to come from the private sector, we should recognise that the right business culture is a basic ingredient. Changing a country's culture of innovation and entrepreneurship is no easy task and it is usually a long-term undertaking. In other sections of this report we shall examine more closely the factors that foster these changes. However, governments have other options available to them. Why are Americans so innovative? Their success is based on their capacity to attract the finest talents. From its origins as a land of opportunity for European emigrants, entrepreneurship and innovation have been deep-rooted in US culture. It is an open society and the brightest minds of China, India, Russia, Brazil and elsewhere move to the States attracted by the opportunities their own countries cannot offer. As Tan Chin Nam, Chairman of Singapore's Media Development Authority and FTF trustee, explains, Singapore has learned the importance of foreign talent. This small country wants to transform itself into an attractive venue for entrepreneurs not only in both their professional but in their personal lives too.

The appeal of a country for an entrepreneur depends to a great extent on the ecosystem of existing companies. The big Silicon Valley firms act as magnets for talent which subsequently spreads among other companies in search of opportunities. But how can one ensure that the big firms will set up in a region? Though not sufficient in itself, it is essential to remove regulatory barriers. The factors analysed by the World Bank in its *Doing Business*[19] reports quantify the ease of setting up a business in a country and may serve as a starting point for identifying barriers to companies' action:

- Starting a business.
- Dealing with construction permits.
- Employing workers.
- Registering property.
- Getting credit.

[19] http://www.doingbusiness.org/.

- Protecting investors.
- Paying taxes.
- Trading across borders.
- Enforcing contracts.
- Closing a business.

Of these factors, one of the most important is employing workers. The principal asset of any innovating company is the quality of the people that form it, and the labour market therefore needs to be flexible. Too much red tape in drawing up contracts and expensive lay-offs tend to limit companies when it comes to employing personnel. Labour protection should consist not of making it more difficult to dismiss staff, but of helping unemployed people. This will help stimulate the traffic of personnel between different companies and, with them, the dissemination of information and knowledge. This is one of the key factors in the development of innovation, since the blend of different ideas in different environments encourages creativity and innovation. Nonetheless, if the necessary talent does not exist in a given region and cannot be brought in from outside, the company will have to go out and search for it abroad. This is why it is important that immigration policies should offer flexibility by reducing the red tape, costs and time involved in obtaining foreign talent. A flexible labour market and immigration policies will produce an open talent market, making it easier for staff to come in, but also helping ensure that they stay there once they have arrived.

Another especially important factor for any innovating company is copyright/patent protection. Innovation cannot be profitable if new products and services are not adequately covered. Pharmaceutical firms are a clear example. They make large investments in R&D to launch new drugs and their profitability depends on the success of a limited number of them. Yet almost as soon as a product has been launched, it is followed by generic imitations. Without the protection of patents, the pharmaceutical industry could not support its large investment in R&D and developments in medicine would be slowed down. At heart, intellectual property is a way of ensuring the revenue of innovative companies.

However, it is important to protect not only revenue, but also investors. Innovative companies and start-ups tend to involve greater risk than consolidated businesses. Protecting investors against possible business failure encourages investment in this type of business and promotes a greater tolerance of failure. But tolerance of an investor's failure is no use if the failure of an entrepreneur is not tolerated as well. The law should not penalise corporate bankruptcy. Entrepreneurs invest time and money in new businesses and they need to know that if the venture fails, that is all they will lose. In the same way, the bureaucracy involved in bankruptcy proceedings needs to be simplified, allowing the entrepreneur to get back on their feet again quickly.

The factors studied by the World Bank are not exclusive to entrepreneurs. All businesses will benefit from policies that cut overheads, such as tax and energy costs. These costs are greater in industry than in the services sector, but it is important to remember that innovation happens on the factory floor too. The focus on the top of the value chain should not blind a country to the opportunities offered by industry. Nonetheless, both industry and services are affected by infrastructures. Roads, airports, railways, mobile communications, broadband, etc.; there are many ingredients in the recipe of innovation, and it is government's task to identify the most important ones.

However, one thing needs to be clear: copying is not innovating. Repeating is not innovating. Why invest large sums of money in R&D to get a product that can be had elsewhere? However, replica may be innovation. Think of sushi, for example. Even if there was no culinary breakthrough involved, surely the first Japanese person to offer sushi abroad must be considered an innovator? If a government wants to innovate, it must not hinder external innovation. It has to encourage the use of new technologies, products, processes and organisational systems. It should promote the dissemination of new innovations, since there is no more decisive factor for promoting innovation than innovation itself. One effective way of promoting it is through example. The adoption of new technologies by the public administration blazes a trail for companies and this is particularly true of SMEs. For example, if all procedures and formalities can be done on-line, then SMEs will have no choice but to use the Internet in their operations.

Teaching the basics of surfing: the government's direct function in innovation

Innovation does not happen overnight. The measures we have outlined do not actually foster innovation, but they do make things easier for it when it does appear. It is a matter of publicising your beaches to attract the best surfers, so that they in turn will attract candidates from your own country. But innovation requires time, and if it is not already part of the culture, it requires even more time. Innovation needs to be viewed as a manufacturing process. First you need to invest in the assets and, once you've set up the factory, you can start production. In innovation, the assets are not plants or machinery, but companies, universities and, essentially, people. The products and services are new concepts and ideas that have a practical application on the market; in short, the elements identified as innovation.

Up to now, we've talked about "maintaining" the "factories" of innovation. Regulation and the right policies help oil the machines, optimise the operations and keep the place clean so that the innovation process operates in the best conditions. But the quality of the innovation depends to a great extent on the existing assets, and these depend on the market. Should the government provide the assets? Any sustainable innovation process must clearly come from the private sector. In the US, the function of the government is to align policies with the needs of business. Innovation is so deeply-rooted in business culture that the main function of the public sector is simply not to get in the way. However, in other countries, the markets do not always operate in optimum conditions and the government needs to get directly involved in innovation. In this case, government needs to not only wax the board, but also give the first surfing lessons.

Public research has been a feature of society throughout history. Even in the US, the innovator par excellence, it still plays a considerable role. The US Defence Department invested over 79 billion dollars in research, development, testing and evaluation in 2009[20]. Public research has led to some great innovations; the best known of recent decades being the Internet. However, is this the best way of encouraging innovation? One could argue that the results do not justify the cost incurred, but this is one way that the government can encourage innovation in certain strategic industries. As Nir Elperin, Vice President of Arba Finance Company and FTF expert, explains, the Lavi project, promoted by the Israeli government to build an Israeli fighter jet, is a clear example. Although the project

[20] http://www.gpoaccess.gov/usbudget/fy11/pdf/budget.pdf, p. 58.

was cancelled, the initiative fostered the development of companies and the dissemination of knowledge and experience in technologies throughout the country, a factor that has helped position Israel as one of the most innovative countries in the field of new technology.

For its part, the British Department for Innovation, Universities & Skills considers that the government should lead innovation in public services such as health and public transport[21]. In an ever more competitive global economy, there are strong incentives for private companies to innovate, since it can help them reduce costs or launch more attractive and higher quality products and services. On the other hand, innovation has not been decisive in the survival of public organisations, which operate under very different conditions to the private sector. The pressure, interests and constraints faced by this type of organisation do not encourage innovation. On occasions, innovation in the public services is seen as a luxury or an additional obstacle. However, the effectiveness of these services depends to a great extent on innovation, and it should therefore be seen as a key activity for improving the ability to respond to citizens' needs.

A classic example of state-sector innovation are the reforms made in the New York Police Department (NYPD) in the 1990s[22]. With the backing of Mayor Rudolph Giuliani, Police Commissioner Bill Bratton changed the style of policing and the organisation of the NYPD. Some of his most important innovations included a focus on minor offences (based on the famous "broken windows" theory), the introduction of technology in management and an organisational change to give more responsibility and power to district heads, all of which helped significantly reduce crime levels in the city.

There is no reason why the direct promotion of innovation should be restricted to the public sector. Public aid in this field is common in many countries and can consist of direct grants or tax credits (the most common method) for R&D. Given that innovation is a long process, it is hardly surprising that its effectiveness does not depend so much on the amount as its consistency over time[23]. It is therefore important that an innovation agenda should not be affected by changes in government. The development of an intelligent innovation policy requires a commitment to industry, an in-depth understanding of the economy and a capacity to formulate an effective long-term innovation strategy. Despite the fact that it affects all government departments, there must be a specific department responsible for innovation strategy and policies, with a unit qualified to provide the theoretical and practical experience needed in such an important and complex area of economic policy[24].

3.2. Transforming the company: innovation is profitable

The days leading up to the earnings announcement are always pretty frantic at the head offices of any large company, especially if it is listed on the stock exchange. But why this obsession with short-term results? When you invest in a company, you're not investing in this year's performance or even next year's. The stock market reflects investors' expectations for the future. Companies should therefore focus their efforts on the *future-value premium*[25], in other words, on expectations for business growth. It's the typical battle between the short and the long term. Improving operations, cutting costs and growth in sales are all examples of the sort of short term solutions on which management tends to focus to improve its balance books. But sustainable growth in a mature industry does

[21] Department for Innovation, Universities & Skills, *Innovation Nation*.

[22] http://www.idea.gov.uk/idk/aio/1118552.

[23] *The Innovation Imperative in Manufacturing, How the United States Can Restore Its Edge*, BCG, March 2009.

[24] *Hidden Innovation, How innovation happens in six 'low innovation' sectors*, NESTA, June 2007.

[25] "Future Value and Innovation: How to sustain profitable growth", *Outlook*, Accenture, 2007.

not come from business-as-usual, but from new business opportunities. And this is where innovation comes into play. Managers, analysts and investors must understand this.

With their short-term approach, some managers neglect innovation as a source of added value. Their attention is only drawn to the subject at times of crisis, when they see their business models being threatened. This may be the reason why innovation is such a buzz word at the moment. Or perhaps it is because of the results posted by Apple, the innovator par excellence, which in a recession year, 2009, managed to grow profits by 25% [26]. Whatever the reason, companies seem to be increasingly concerned with innovation. A study by Accenture with The Economist Intelligence Unit carried out at the beginning of the crisis (September 2008), showed that 62% of companies surveyed felt that their business strategy depended largely or totally on innovation[27]. This apparent change in direction is good news. However, in the same survey, few respondents felt their innovating activity was being effective. Another more recent study by The Boston Consulting Group shows similar results[28]. Innovation has been pushed down the agenda of many companies. Now that it is on the rise again, these organisations are having to face the crude reality: they are not prepared.

Innovating culture: a necessary condition for gaining the future

Why does innovation fail in companies? The answer can be summed up in one word: culture. Beyond their enthusiasm for new ideas, the managers' focus must be on developing a culture of innovation. Sporadic innovation may save the results for one or more years, but to ensure sustained growth in value over time, you need continuous innovation, which can only be obtained through an innovation culture. A company's culture is not what it says in its press releases or its annual report; it's the day-to-day work, it's what the employees feel, what the managers convey and more importantly still, it's the combination of all the different actions that define the way a company operates. What use is it to talk about transparency at press conferences if management hide information from their collaborators? The same is true of an innovating culture. It's no use talking about the importance of new ideas if they are not listened to when they emerge in some part of the organisation.

Employees must feel that they form part of a dynamic organisation that encourages innovation. Building an office that looks like a university campus or putting couches in the offices may help create an innovating atmosphere, but that's not the same as an innovation culture. Google is not an innovating company because it has games rooms and slides in its offices, but because of its leaders. A business culture comes from management — but it is forged with deeds, not words. Companies like Apple, Toyota and Google have all created such a culture and they all have something in common: the resources to encourage innovation and their commitment to this area have come from the very top.

Illustration 8 shows the characteristics that define an innovating culture. Organisations that have achieved such a culture innovate in every sense. Incremental advances and changes, new products, new services and even radically different ways of doing business can come from anywhere in the company. However, the true test is regularity. How often do new ideas, concepts, products or services emerge in the firm? If there is an innovating culture, innovation happens all the time. Internal discussions among employees tend to centre on innovation

[26] http://www.apple.com/pr/library/2009/10/19results.html.

[27] "How to get the most from your best ideas", *Outlook*, Accenture, 2008.

[28] *Innovation Imperative in Manufacturing*, BCG, 2009.

The Innovation Culture Table		
	Status Quo Culture	**Innovation Culture**
1.	Predictability	Un-predictability
2.	Seek stability	Seek novelty
3.	Focus on core competence	Focus on edge competence
4.	High success rate	High failure rate
5.	Reinforce the organizational hierarchy	Reinforce organizational networks
6.	Fear the hierarchy	Focus on creative tension
7.	Avoid surprises	Embrace surprises
8.	Focus on inside knowledge	Combine inside and outside knowledge
9.	Easy to live with	Hard to live with
10.	Corporate politics	Moving the cheese
11.	Efficiency through stardardization	Efficiency through innovation
12.	Extend the status quo	Abandon the status quo
13.	Avoid change	Embrace change
14.	Measure stability	Measure innovation
15.	Look for data to confirm existing management models	Look for data to contradict existing management models
16.	Look for certainty	Embrace ambiguity

Illustration 8: Creating the Innovation Culture.
Sources: *Creating the Innovation Culture: Geniuses, Champions, and Leaders,* Innovation Labs.

and new ideas arise in conversations of all kinds. If that is what is happening in a company, even if it's not the next Apple or Google, it does mean that innovation is impregnating the culture and the likelihood of success will be increased.

Institutionalising innovation: inspiration + perspiration

If innovation is so attractive and so necessary, why don't all companies innovate? Innovation is associated with creativity, inspiration and even fantasy. As a result, many executives see it as being something random and uncontrollable. It is hardly surprising, then, that the struggle faced by managers is not their commitment to innovation, but their capacity to implement innovating initiatives efficiently. True, creativity and inspiration are necessary factors in the innovation process, but they should not be solely associated with philosophers or researchers. Both are innate human skills. Innovation in business consists of nurturing and compiling ideas, taking them further and being capable of putting the viable ones into practice.

Accenture, for example, sees innovation as a business discipline. Like strategy, it encompasses the entire company and even its surroundings. This is a root-and-branch process that the company divides into three phases: Foundation, conversion, consistent execution [29]. At the foundation stage the capabilities, technologies and tools are in place, as well as the leadership and culture, to build a production line, not of products, but of ideas. At the conversion stage, the company has the procedures to identify and cultivate the good ideas (see Illustration 9). At execution stage, the company makes the investments and devotes the resources needed to turn the ideas into innovation.

[29] "How to get the most from your best ideas", *Outlook*, Accenture, 2008.

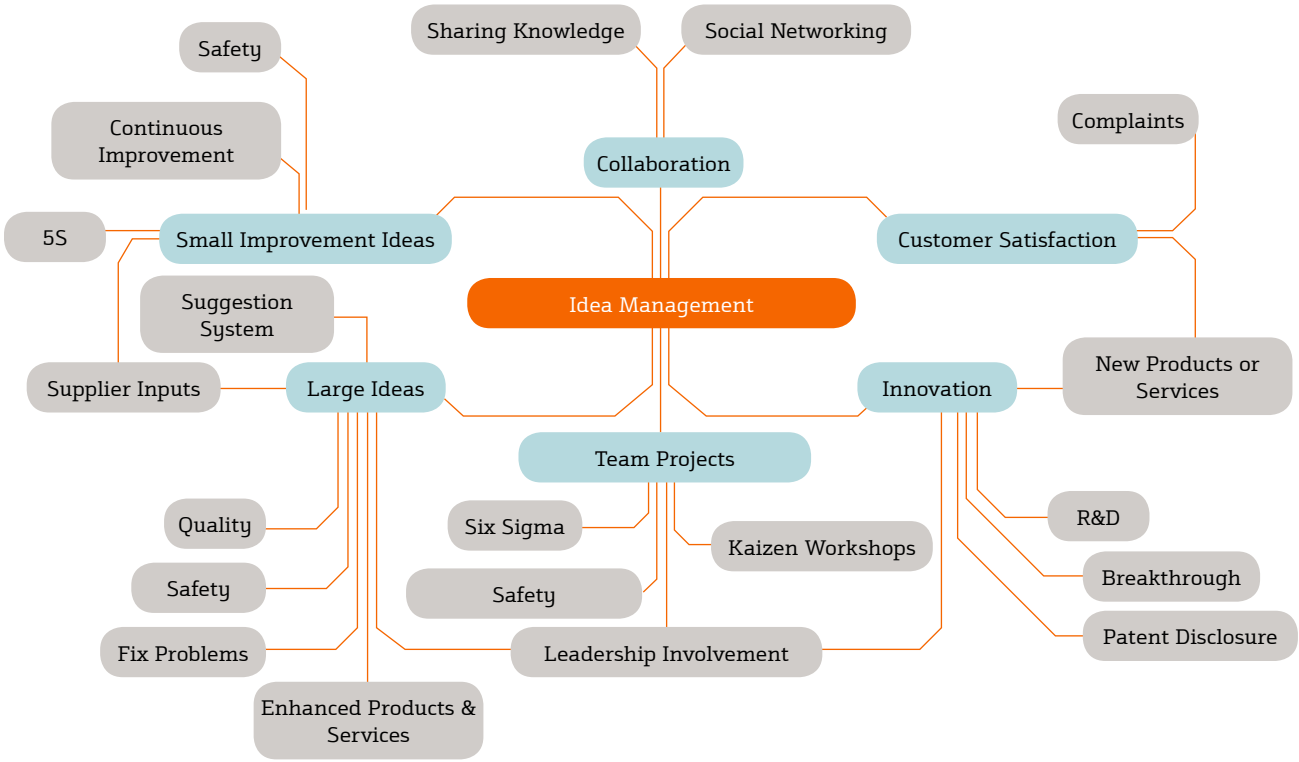


Illustration 9: Managing ideas in an organisation.
Source: TQS, *Creating an Innovation Portfolio*.

Nonetheless, there are various barriers that can slow implementation of an innovation process[30]. One of these barriers is the inherent mindset found in most large organisations. In most cases, the opportunities that arise in a large company dwarf those created in small companies. However, large corporations are so centred on the everyday running of the business that they don't often see those opportunities. Organisations must therefore adopt a mentality similar to that of venture capital firms. They need to harvest and manage the ideas, providing outlets for the most attractive ones.

Another barrier that needs to be removed lies in the allocation of resources. Many corporations are reluctant to devote the resources needed for new non-traditional initiatives. Small projects, which lie outside the scope of entrepreneurs, would represent a tiny part of the budget of a large company. The possibilities of success may be very limited, but so too is the risk — and the potential profit is immense. The process involves staking the expected value, i.e. assuming that some initiatives will fail, but among all of them, some innovations will emerge whose profitability makes up for the possible losses caused by the others. It is also necessary to free the creative skills of the organisation. Corporations are comprised of thousands of employees, which means thousands of potential sources of creativity, but this requires commitment and motivation. It consists of listening to and weighing up the employees' ideas. It is not possible to give all initiatives the go-ahead, but it is possible, and necessary, to give the reasons for the decisions. Rejecting ideas out of hand with no explanation can be a serious de-motivator.

[30] The DeSai Group, *Mastering Innovation: Roadmap to Sustainable Value Creation.*

What are the factors that determine the success of innovation? According to the Boston Consulting Group, there are four keys to promoting innovation: idea generation, structured processes, leadership and skilled workers[31]. Just like a crop, ideas are the seeds of innovation. They need to be tended, watered and fed, but without seeds there will be no fruit. Ideas are new products, concepts, perspectives, and they don't have to come from within the company. Employee creativity is a major source of ideas, but not the only one. The companies come into contact with providers, customers, collaborators and other institutions, who can all be sources of ideas. Coca-Cola's *fridge pack* is a perfect example[32]. This novel packaging system allowed a 12-pack of cans to be stored straight in the refrigerator. By reducing the need to restock the fridge, more cans were kept cold, increasing per-customer consumption and leading to a 10% growth in Coca-Cola's sales. Where did the idea come from? One of its main providers, Alcoa. One of the world's largest aluminium manufacturers, with profits tied to the sale of cans, Alcoa improved its business performance through this innovation in its customer's distribution.

However, the initiative for collaboration should not come from the supplier, but from the company. It is a question of applying the concept of *open innovation*[33]. In this principle, the company does not look solely at its products or services, but at the whole value chain. Suppliers, customers and collaborators all form part of the innovation process. Their different perspectives form a source of new ideas and the entire group benefits. Toyota and Starbucks are two possible examples. Toyota, working closely with its providers on *just-in-time* lines became the world's top carmaker. With the launch of MyStarbucksIdea[34], Starbucks gathers its customers' ideas, enabling it to adapt its products to their needs.

Although it might seem contradictory, structured processes and a clear leadership, traditionally seen as enemies of creativity, are another two keys to innovation, according to the Boston Consulting Group. The important thing is to strike the right balance between discipline and freedom. Accenture breaks these two keys to innovation down into the five factors described below[35].

The first factor is to offer a clear statement of mission and strategic direction. What role does innovation play in the company? What type of innovation is being sought? What value does the company expect to obtain from the innovation? These are questions that the statement has to answer. Nonetheless, if it is to be effective, this message must be open enough so that nobody is left out, and it must come from the very top. Management cannot offer excuses. If the definition is too limited, it can always argue that it is irrelevant to the business, and if it focuses only on long-term performance, their argument will be that the shareholders want immediate results. Innovation, therefore, will continue to be sidelined.

The second factor is a formal accountability-based innovation infrastructure. Innovation is up to everyone; everyone has to contribute something, but without certain clearly established responsibilities, it becomes nobody's job. If company satisfaction is taken as a measure of success, appointment of a senior manager to coordinate and lead innovation seems to work.

However, the infrastructure is of no use without the third and fourth factors, a dedicated budget and resources and repeatable, accessible tools and capabilities. The words will be meaningless without material support. The innovation will not

[31] BCG, *Innovation Imperative in Manufacturing*, 2009.

[32] http://www.bizjournals.com/atlanta/stories/2002/08/05/story5.html.

[33] "Open innovation: How to create the right new products, the right way", *Outlook,* 2009, Accenture.

[34] http://mystarbucksidea.force.com/.

[35] "How to get the most from your best ideas", *Outlook*, Accenture, 2008.

Like experienced investors, innovative companies create portfolios of project investments

have the hoped-for impact without the same access to resources as the other departments.

And fifthly, the company needs clear performance indicators and milestones, in order to measure the results of all the investment. Like any business discipline, it is necessary to demand results, but the indicators must not be too short-term. A premature and short-sighted use of traditional indicators such as ROI (return on investment) —known in R&D circles as "restriction on innovation"— may be counterproductive. There are a host of indicators for the innovation process[36], which can be classed as either "hard" or "soft". Hard indicators are quantitative, focusing on an analysis of profitability, whereas soft indicators are qualitative, designed to oblige involved employees to go further with their work and make it more efficient.

Creativity, consistency, new perspectives and inspiration are key features of innovation. It is hardly surprising, therefore, that the Boston Consulting Group considers workers' skills to be the most important factor for innovation in a company. Much of the solution comes from the education system, which we shall address in the next section. However, the companies can and must bring their influence to bear in this field. Today's society is characterised by change. New products, new services and new technologies are appearing all the time. Adaptability is essential for any professional, and it requires lifelong learning. Some of this education involves "self-training" and depends on the person's own determination, but another part depends on the company. Job rotation, allocation of a mentor and financing of courses, MBAs and PhDs are examples of investment in training. This all comes at a cost, but the important thing is to strike a balance between the cost of this investment and the employees' training.

Accept and manage the innovation risk

One feature of the innovation process is uncertainty, and uncertainty involves risks. Accepting innovation means accepting risk. An idea may be chosen deliberately and with arguments, may have clear objectives, be marketed and developed carefully and, yet fail to produce the hoped-for results. An innovating company does not consider this to be a failure. Why? Because it is a small investment. The resources employed are insignificant compared to the company's assets and do not endanger the organisation. Moreover, the employees learn during the process. Even if it is not reflected in the sales figures, the value of the human capital has increased and the organisation will be better prepared next time round.

An innovating company understands that it is not wise to put all its savings into a single investment. Like experienced investors, these companies create portfolios. You don't put all your eggs in one basket, if you want to avoid a disaster if the basket breaks. Whirlpool, for example, decided to invest heavily in innovation by making lots of small investments. In other words, they placed lots of small bets in order to ensure a big win. They invested 20 million dollars in 400 small projects of $25,000 each. Some of these ideas failed, but overall, it was a winning initiative. The net result of the projects is now an extra one billion a year in the company's accounts[37].

It is not just launching small projects. Large companies make important investments in innovating projects and venture capital firms invest in large

[36] *Innovation Metrics: The innovation process and how to measure it,* InnovationLabs, November 2008.

[37] Max McKeown, *The truth about innovation: "Find the creativity inside"*, Pearsonbooks.

innovation projects. It's a matter of understanding the risk. Like any other business discipline, innovation should not be allowed to put the whole company at risk. Illustration 10 shows how ideas of all types can arise in a company. Most involve simple ideas for improvement, with little risk for the company. Some may involve more radical changes to the organisation, with a much greater risk. The innovating company must choose its place. It can innovate on a simple

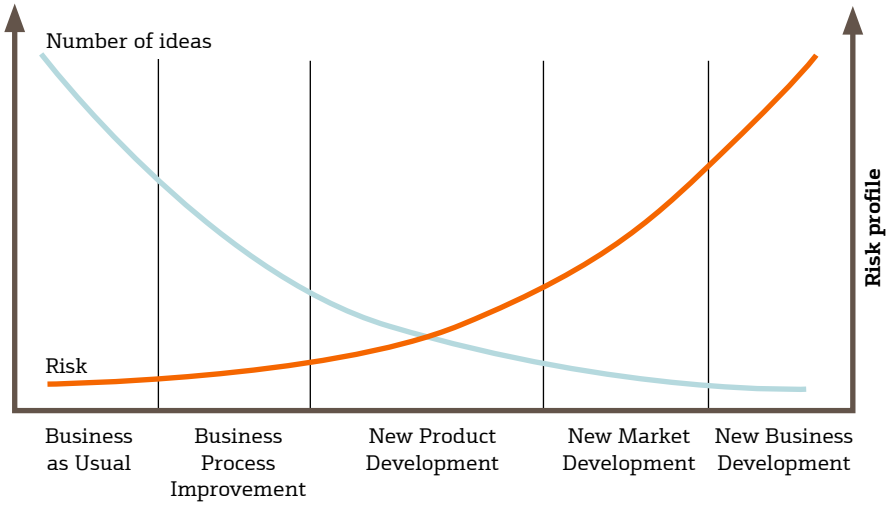


Illustration 10: Number of ideas compared to risk.
Source: An Integrated Approach to Managing Innovation, White Paper, Project Leaders International.

scale, with many small projects, or innovate on a large scale, with a small number of ground-breaking initiatives. At all times it must be careful to ensure that taken together, the innovating process does not place the survival of the organisation in danger.

3.3. Master in innovation: the role of education in an innovating culture

Innovate or die. Companies face this dilemma in a globalised society that is evolving at a dizzying speed. But this maxim does not apply only to companies; it should also be made into a working philosophy for their main assets, people. Globalisation, low transport costs and new technologies are changing the business world. New products are quickly copied by the competition, giving companies no option but to keep innovating. Society no longer demands merely people with the specific knowledge needed to perform a task or function; it also wants innovation. We have to get past the barriers of the known, to identify opportunities, to think up new concepts and to have the bravery to make them a reality. In short, such a dynamic and changing society requires entrepreneurial spirit. How does one go about building this spirit? If you want to start at the foundations, education must be the starting point.

There has been much discussion about whether entrepreneurs are born or made. One of the causes of the debate is that children of entrepreneurs are often seen to follow in their parents' footsteps. The most likely answer is that they are made, given how widespread the phenomenon of the "self-made" entrepreneur is.

According to Peter Drucker, the father of today's concept of management, "Most of what you hear about entrepreneurship is all wrong. It's not magic; it's not mysterious; and it has nothing to do with genes. It's a discipline and, like any discipline, it can be learned." The FTF experts agree. From this viewpoint, the entrepreneurial spirit of a family has little to do with its genes, and much more to do with the presence of entrepreneurship in their education. Business schools also favour this line, and include courses on entrepreneurship in their curricula. But when should entrepreneurship be taught? The World Economic Forum says there is not a "right" time; rather, entrepreneurship education should be offered throughout the whole educational cycle[38].

Entrepreneurship education is essential for developing the human capital needed for the society of the future. This is not something that can be promoted only in universities; it should be a central part of the workings of the education system. The World Economic Forum considers that education must not only evolve, but needs to take a revolutionary approach. The very foundations of all education need to be changed. Governments need to turn their education policies around: one interesting example is the "Race to the Top" programme promoted by the US Education Secretary[39]. With a budget of 4 billion dollars, the programme radically changes the way the education budget is shared out among the different states. Each state presents its plans for educational reform and the funds are allocated as a prize to those that are most ambitious in their aims. The idea is to encourage innovation and entrepreneurship not only among students, but also among the education authorities themselves. Illustration 11 shows a comparison of the present state of entrepreneurial education in schools in different countries. The

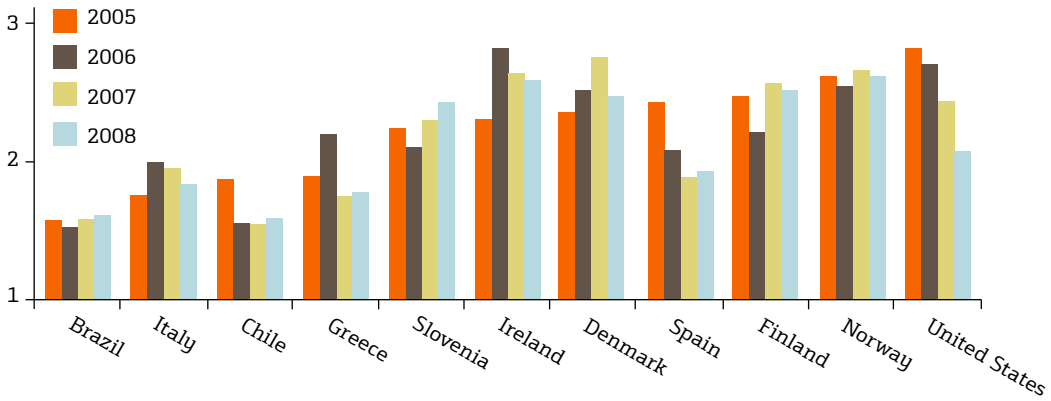


Illustration 11: Average Ratings by National Experts on the State of In-School Entrepreneurship Education and Training in a Sample of GEM Nations for the Years 2005-2008.
Source: GEM National Expert Survey 2005-2008.

fact that the countries with the best education systems, such as Finland, the US and Ireland, also lead the field in this area is a clear indicator of the importance of entrepreneurship in education.

Laying the foundations for entrepreneurship and innovation

Academic institutions play a central function in developing the attitudes, skills and behaviour of young people. The foundations for this development are laid

[38] *Educating the Next Wave of Entrepreneurs: Unlocking entrepreneurial capabilities to meet the global challenges of the 21st Century,* World Economic Forum, April 2009.

[39] http://www2.ed.gov/programs/racetothetop/index.html.

among the youngest age groups, in primary education. Traditionally, schools have focused their effort on providing these young people with the basic tools for everyday life. It is time they helped encourage a culture of entrepreneurship and innovation. It is not just a matter of offering skills, but also of changing their way of thinking. Sir Ken Robinson, author, lecturer and advisor in education in the arts, considers that the current education systems are based on an industrial model. He advocates revolutionising them entirely[40]. According to Robinson, education as it is currently designed, does not encourage, but actually eliminates creativity. Young people are educated in a system in which mistakes are stigmatized. Getting things wrong is the worst thing you can do. But, how is it possible to achieve something original if you're not prepared to get things wrong?

Changing a traditional education system takes time. The main reason is the teachers. If it is to be successful, education for entrepreneurship requires entrepreneurial teachers. However, few teachers have been entrepreneurs... and few entrepreneurs make good teachers. The right combination of education and entrepreneurial content will be essential for developing and training young people. The teachers, who are used to teaching basic subjects, lack the experimental and practical approach needed, but they must be capable of getting students involved in entrepreneurial activities. To ensure that this happens, teachers' entry tests must include experimental techniques and entrepreneurial content. One step forward might be to create entrepreneurship teaching certificates which would make it possible to ensure certain minimum standards. Another way would be to bring recognised entrepreneurs on board, together with education experts, to create an entrepreneurship curriculum. Like parents, teachers are important role models for students and, as such, they are a central factor in the process. Finland is a good example. The country provides incentives for brighter students to go into education and as a result has created one of the best education systems in the world. If a country wants to encourage entrepreneurship, the best entrepreneurs must be involved in educating their future successors.

Education for entrepreneurship covers all types of talents and aspirations. It cannot be based on simple measurements of capacity, such as average grades, exams and IQ tests, but must reward the diversity of approaches of each individual and, at the same time, teach the basics of entrepreneurship. The National Foundation for Teaching Entrepreneurship (NFTE), which seeks to encourage entrepreneurship among low-income groups, has codified what it views as the essential lessons in "Twelve Concepts Every Young Person Should Learn About Business Before Graduating High School"[41]. The World Economic Forum highlights a number of these concepts: Joy of business, serving others, wealth creation and ownership; market opportunity recognition and research; empathy ("walk in your customer's shoes"); concepts of comparative advantage, laws of supply and demand and marginal utility; and basic calculations such as return on investment break-even and compound interest.

What methods can be used to instil an entrepreneurial culture at such an early age? The WEF also has some alternatives to offer in this area. Many are based on practice, such as market research by way of simple interviews in the community, creating businesses run by students and holding competitions, games and simulations. Others, however, are based on example. These include invitations to entrepreneurs to talk in class and visits to local businesses, because the most

[40] http://www.ted.com/talks/sir_ken_robinson_bring_on_the_revolution.html.

[41] *Educating the Next Wave of Entrepreneurs: Unlocking entrepreneurial capabilities to meet the global challenges of the 21st Century,* World Economic Forum, April 2009.

effective way of overcoming the fear of entrepreneurship is by demonstrating through example that entrepreneurship is possible.

As Muhammad Yunus, creator of the concept of microcredit and co-founder of the Grameen Bank says, "My greatest challenge has been to change the mindset of people". For this very reason, it is better to start from the beginning.

The University of Innovation

If primary education is the right place for encouraging an entrepreneurial culture, the university is the best place for complementing that entrepreneurial spirit with an innovating culture. The fact that four of the world's leading universities are in the largest innovation clusters —Stanford and Berkley in Silicon Valley and Harvard and the MIT in Cambridge, Massachusetts— is no coincidence. A region's development is closely linked to its academic institutions. The universities provide the framework in which people acquire vital skills for innovation. Specialist knowledge, exposure to independent thinking, creativity in problem solving — it's all to be found at the university. Universities attract talent and investment, as well as providing a bridge between public and private research. Higher education must therefore be the focus of attention in a region's innovation strategy.

According to Pedro Arboleda, partner of the Monitor Group and FTF expert, the university must understand the needs of its customers - in this case, business. Universities are fonts of human capital and the skills the students develop in them must be aligned with the market's needs. The regions must promote communication between their universities and local business to ensure that they are both singing off the same hymn sheet. At university, the needs of business must be translated into educational assets. Much of local public and private investment goes to universities. Aligning academic goals with those of business is a way of capitalising on that investment, in other words, of retaining the talent trained in the region.

The North Carolina Research Triangle is an example of how local public authorities, together with universities and business can promote a region's development[42]. Occupying an area of 7,000 acres, the Research Triangle Park[43] contains one hundred and fifty organisations employing 150,000 people. The talent is sourced at the three nearby universities: Duke University, the University of North Carolina and the North Carolina State University. The objectives of the university and business are in line, so that the talent trained at the universities tends not to leave the area when they complete their studies. One factor which facilitates this alignment is the "specialist conversations". This means that companies have a counterpart in the universities who "speaks their language".

However, the universities are not only a source of talent, but also of ideas. And it is precisely the exercise of turning those ideas into innovation that requires collaboration with business. This is one of the factors that differentiates innovation in the USA and Europe. The European higher education system has some top universities with leading academics and researchers, who produce excellent articles and boast many Nobel prizes. However, their ideas tend to go no further than their ivory towers[44]. In the US, on the other hand, university-business collaboration is much more widespread. Examples such as the Center for Integrated Systems at Stanford University[45] —a centre for applied research and for educating new generations of scientists founded as a result of a partnership between Stanford and companies in the industry— are to be found throughout the country.

[42] http://www.rtp.org/.

[43] http://www.researchtriangle.org/.

[44] "The fading lustre of the clusters", *The Economist*, October 2007.

[45] http://www-cis.stanford.edu/.

Another way in which innovation is encouraged at university is by designing specific formulae for recognising research. A researcher's work is plagued by uncertainty and only a small percentage of the ideas actually materialise as innovation, but both the researcher and his or her colleagues can learn from the mistakes. Innovation arises from shared learning. Recognition, therefore, must not be associated merely with success in research, but with a job well done. Nonetheless, it is necessary to encourage the marketing of successful ideas. Historically, the function of university researchers has not been to market their ideas and inventions. Pressure on the budgets of state-owned universities and an ever greater proliferation of private institutions is bringing change in this aspect. However, one essential condition for such marketing is a legal framework that stimulates universities to patent their inventions[46]. Registering patents and selling licences can give a major boost to a university's finances, but so can start-ups born within the universities themselves. The universities can provide the necessary support to their own students and researchers by way of business incubators and entrepreneurship support programmes and in exchange receive a benefit in the form of a share in the capital. The universities of Peking and Tsinghua obtain important returns using this system[47].

Educating to manage innovation

Innovation does not consist only of science and technology, but also of management and leadership. For this reason, business schools play an essential role in the education system. Managers play a key part in different aspects of innovation[48]. Their functions include decision making in the three components of an innovative system: supply, demand and funding (see Illustration 12). On the supply side, a good manager's skills are critical for establishing priorities and organising the resources that will encourage innovation. On the demand side, the managers make the decisions on whether to invest in their providers' innovative

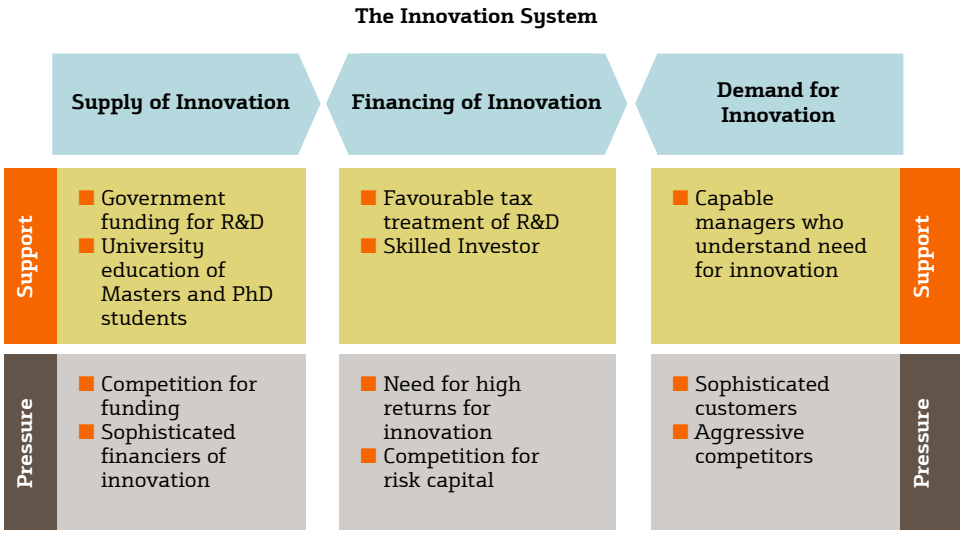


Illustration 12: Supply, demand and funding of innovation.
Source: *Management matters.* Institute for Competitiveness & Prosperity.

[46] *Educating the Next Wave of Entrepreneurs: Unlocking entrepreneurial capabilities to meet the global challenges of the 21st Century,* World Economic Forum, April 2009.

[47] Kun Chen, "Universities/Research Institutes and Regional Innovation Systems: The Cases of Beijing and Shenzhen". http://hcd.ucdavis.edu/faculty/webpages/kenney/articles_files/Chen,%20Kenney%20UR.pdf.

[48] *Business Schools on an Innovation Mission,* AACSB.

products, but managers are also important in funding, as financiers who take the decisions to provide the necessary funds to innovative companies.

Managers are knowledge assets too. Their knowledge of organisation, product marketing and implementation of new processes are essential in the dissemination of innovation. This knowledge, acquired through practice and education, is applied in different companies throughout their professional career. In turn they act as architects of change. New technologies make it necessary to restructure companies and it is these managers who have the vision and initiative to re-orientate the organisations under the new conditions. However, their function is not limited to organising innovation; they are also a source of another type of innovation — management innovation. The success of Toyota or Zara is not due to product innovation but management innovation. Just-in-time —the management strategy designed to reduce unnecessary stock to a minimum— and the philosophy of lean management —which encourages the elimination of all resources that do not generate value for the customer— are different examples of this type of innovation. Support for collaboration across borders, between organisations and industries is an essential part of managing the process. Innovation is becoming globalised as society does, and international networks are becoming increasingly important. Managers, with their networks of contacts, act as bridges, connecting companies with this global economy and extending their view of their surroundings, offering new opportunities for innovation.

As Illustration 13 shows, business schools, the centres of learning of the future managers, are another element in the social context, and it is this context that determines the innovation process. Innovation is local. Geography, culture, existing companies — these are just some of the factors that determine the innovation process, as demonstrated by the existence of clusters in different parts of the same country. Business schools that want to promote innovation should start locally, defining their objectives and their strategy according to the innovation system of their key communities.

According to AACSB *(Association to Advance Collegiate Schools of Business)*, there is no perfect recipe for the function of business schools in the innovating process[49]. Some schools focus on training students to contribute to innovation. Others choose to centre directly on improving innovation through research into new business models, organisational systems, etc. And others decide to act directly in the community, helping innovative companies by means of funding or incubators). None of these approaches is better than the others. Indeed, society benefits from this diversity of approaches, because, in matters of innovation, education in management involves both the development of skills and the transfer of knowledge.

Nonetheless, perhaps the key factor that determines the role of business schools in innovation is their capacity to create connections. These institutions have a great capacity to bring together entrepreneurs, venture capital and international leaders from anywhere in the world. Since the speed of dissemination is a key factor in the success of new innovations, business schools can speed up the process by bringing together the best suited group of people. Students' associations, managerial programmes and associations of business angels are some of the mechanisms that can be used to create powerful professional networks that will facilitate the dissemination of ideas and strengthen innovation.

[49] *Business Schools on an Innovation Mission*, AACSB.

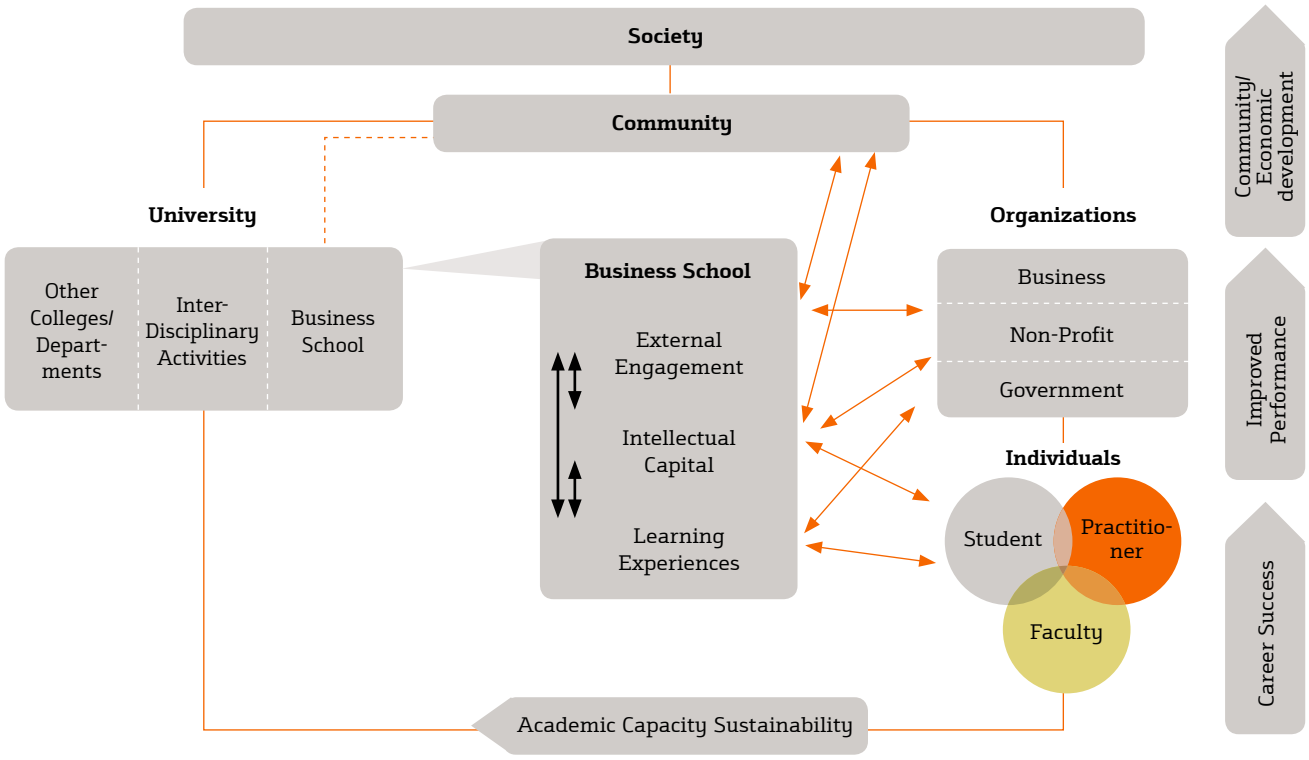


Illustration 13: Functions and activities of business schools in the innovation process.
Source: *Business Schools on an Innovation Mission*, AACSB.

In the words of Steve Jobs, "Innovation has nothing to do with how many R&D dollars you have. When Apple came up with the Mac, IBM was spending at least 100 times more on R&D. It's not about money. It's about the people you have, how you're led, and how much you get it"[50]. That's what education is all about. Whether it's in high school or business school, it's not a question of innovating, it's a matter of training the people who will innovate in the future.

3.4. The real protagonist is you: people in the innovation process

Where does innovation come from? Ángel Cabrera, president of the Thunderbird School of Global Management and FTF expert has no doubts in this regard: "Only by letting thousands and millions of entrepreneurs try new ideas, to innovate, to create businesses that put those ideas to work in a competitive and open way, only by doing those things are we going to be able to tackle some of the world's big problems"[51]. Innovation is the fruit of the people making up a company, a region or a country. The culture of a group is no more than the reflection of the people who form it, their past and present beliefs, ideas and behaviour. It is these people who make innovation possible.

Innovation requires both creativity and initiative, but the latter is the primary identifying feature of an innovating culture. Creativity is not exclusive to a small elite. Although it is true that some people are more creative than others, it is reasonable to assume that, given the right context and the opportunity, nearly anyone can come up with a creative idea. The employees of any company and the citizens of any region or country are a potentially infinite source of ideas. It is the

[50] Kirkpatrick, David, "The Second Coming of Apple", *Fortune*, November, 1998. http://money.cnn.com/magazines/fortune/fortune_archive/1998/11/09/250834/index.htm.

[51] *Educating the Next Wave of Entrepreneurs: Unlocking entrepreneurial capabilities to meet the global challenges of the 21st Century*, World Economic Forum, April 2009.

Once a certain level of well-being has been assured, some people have the continuous desire to get on that feeds the initiative to continue innovating

initiative and capacity to put these ideas into practice that defines an innovating culture. The important thing is to encourage the entrepreneurial spirit among people and this can only be achieved with the right motivation.

The drivers of this motivation vary greatly. One might even say that there are as many reasons for entrepreneurship as there are entrepreneurs. The FTF experts group these motives into two major sources of innovation. The first involves some burning desire, hunger or need for survival. Whether it is China's need to produce food for its over 1.3 billion inhabitants[52] or the desire by the founders of Southwest Airlines, Rollin King and Herb Kelleherto, to break into the mature and regulated market of air travel[53], this stage is characterised by a pressing need to innovate. It is necessary to innovate because existing technology, policies and management systems are not sufficient. Creativity springs from a pressing need to solve an urgent problem and the motivation for entrepreneurship has its origin in the more basic instinct of survival.

The second major source of innovation lies in competition. Once a certain level of well-being has been assured, some people have the continuous desire to get on that feeds the initiative to continue innovating. The personal motivations are difficult or impossible to determine, but the results are tangible. We do not know what really led the richest man on the planet, Bill Gates, to become the world's greatest philanthropist, or what made Steve Jobs return to Apple, but the results are there for all to see. The tangible results of their motivations are the Gates Foundation's target-based system of funding humanitarian projects and Apple's iPod, iPhone and iPad. This desire for self-betterment is further spurred by competition. Just as sportspeople give the best of themselves when they come up against competitors on their own level, innovation is fostered by competition. The "cola war", between Coca-Cola and Pepsi is a clear example. Just think of the variety of soft drinks now on offer as compared to forty years ago.

A burning desire, a hunger and a need for survival on the one hand, and competitiveness on the other, are necessary conditions for innovation, but they are not enough in themselves. It would be difficult to imagine Steve Jobs manufacturing the iPhone in Uganda. These motivations have to be accompanied not only by suitable government policies, but also by the right infrastructures. Thanks to the fast development of technology and globalisation, the inhabitants of developing countries such as China and India have access to infrastructures that are just as advanced as those of developed countries. These infrastructures, together with policies focused on encouraging economic growth, help support the innovation born out of the needs and desires of billions of people. At the same time, most innovation in developed countries comes from the second source, competitiveness. These countries have the basic infrastructures necessary and promoting innovation will therefore involve encouraging competition and adapting the infrastructures to requirements at any given time.

The different roles in the innovation process

As we have seen in previous sections, innovation is a process in which ideas are transformed into products, services and management concepts that generate added value. Indeed, innovation is the only process that enables an organisation to grow. The other processes are mostly focused on achieving the maximum efficiency of the current business, in other words, on reducing costs. Unlike the latter, the operations and measurements of innovation are not very specific. This

[52] http://www.google.com/publicdata?ds=wb-wdi&met=sp_pop_totl&idim=country:CHN&dl=en&hl=en&q=china's+population.

[53] http://www.southwest.com/about_swa/airborne.html.

is a diffuse process in which management by traditional indicators and parameters is complicated and, to some extent, pointless. It is people who must make up for these shortfalls. For this reason, the basic element in the innovating process is human resources. Innovating means having the right people doing the right thing at the right time.

InnovationLabs, an innovation consultancy firm, distinguishes the three major roles that characterise an innovating company: geniuses, champions and leaders[54]. The *geniuses* are the origin of innovation. They come up with the new insights, turn them into ideas and turn the ideas into innovation. Everyone related to an organisation is a potential innovation genius. Staff, customers, providers and partners offer unique perspectives and valuable ideas that can be transformed into innovations that change the course of an organisation. Even the actions and perspectives of non-customers can constitute sources of innovation. The key factor of the genius is the ability and willingness to see things not only for what they are, but for what they could be. They long to bring to reality what they have imagined or envisioned, and they work with dedication and persistence to overcome the obstacles they may encounter along the way. Another thing that characterises them is that they have a deep insider knowledge of an industry, but they are also open to outside perspectives. They look for new knowledge outside of their own fields to recognize opportunities that others have missed.

Starting from the premise that any member of an organisation can be a genius, it is the work of the leaders and champions to remove the obstacles to innovation. *Champions* support, encourage and promote innovation. They have managerial responsibilities and are the ones that provide the resources for effective innovation. They identify the geniuses and encourage them to look for new insights that will lead to new ideas. But to do this, they need to know what is going on around them. *Genchi genbutsu* —in Japanese, "go and see"— is a central plank of the Toyota management system and one of the main drivers of its great innovation capacity[55]. Just by observing the potential geniuses directly, it is possible to know what skills and resources are available in the organisation to speed up the innovation process. The champions are the mentors who help the geniuses develop their innovating capacities while at the same time acting as connectors, bringing the right people together through their network of contacts. However, their fundamental characteristic is the enthusiasm they show to "intelligent failure". This does not mean failure for failure's sake, but recognising that failure is inherent to innovation. They recognise an unsuccessful idea as an opportunity to learn and they create a climate of trust which does not penalise those who implement an idea that comes in one end of the innovation process but doesn't come out at the far end.

Finally, *leaders* are in charge of designing the structures and operations of the organisation in order to encourage innovation. This means designing the organisation chart, policies and incentives around it. Leaders usually come from of senior management. They are the visible face and act as a reference point and inspiration for the rest of the organisation. However, a leader's function is not limited to what happens within the organisation; their image extends far further. Bill Gates is known not only in Microsoft, but throughout the world. As a result, his capacity to influence innovation is not restricted to his organisation, but extends to a whole region or country.

[54] Innovation Labs, *Creating the Innovation Culture: Geniuses, Champions, and Leaders,* 2007.

[55] http://www.economist.com/node/14299017.

Regional governments and leaders must work together to encourage innovation. This collaboration has two functions. First, governments must promote local idols. The aim is to publicise the function of the innovation leaders who will inspire potential entrepreneurs. According to the Future Trends Forum experts, publicising cases of successful entrepreneurship is one of the most important ways of improving innovation at a national level (See Illustration 14). These stories serve as an example that innovation and entrepreneurship are possible in the region. The success of these leaders reduces the risk perceived by entrepreneurs in their innovating venture. Just as sports successes encourage other people to take up the sport in a player's home country, innovation leaders encourage innovation and entrepreneurship in a region. But collaboration is not limited to creating heroes; the leaders must also get involved in developing innovation in their region. The idea is to work together with governments to design infrastructures, education systems and policies that will encourage innovation. In this way, the experience of the great leaders has an incalculable value for governments, since they have witnessed the barriers and obstacles to innovation from close up. The collaboration between the two is a suitable way of paving the way for entrepreneurship and innovation.

The new Argonauts

Innovation is going global. For example, Silicon Valley continues to be the largest source of technological innovations, but an increasing number of new centres and clusters are springing up, such as Bangalore, Israel and Taiwan, which are taking on greater importance and hosting some of the most novel ideas. But how have these new innovation clusters arisen? Annalee Saxenian, Dean and Professor at

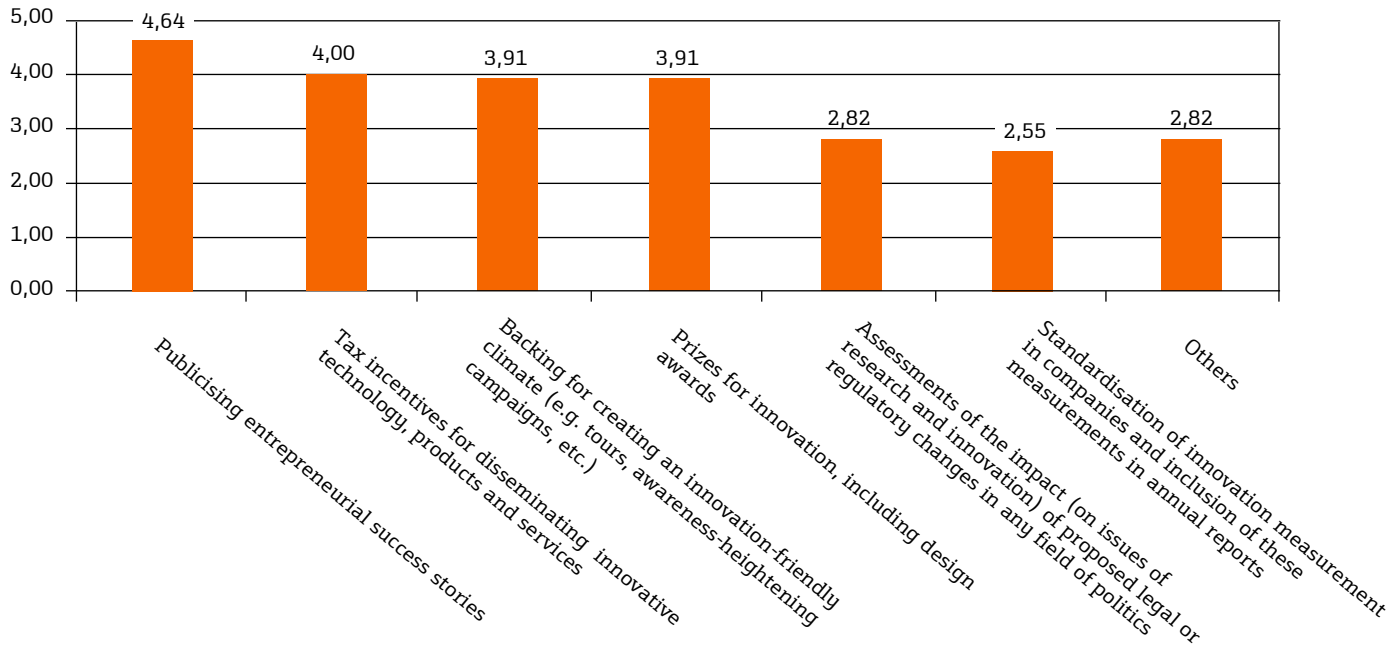


Illustration 14: How important are the following elements related to the markets and innovation culture of a country in improving the national level of innovation?
Source: Authors.

the School of Information and professor in the Department of City and Regional Planning at the University of California, Berkeley and Future Trends Forum expert, suggests one reason. According to Annalee, the reason lies the "new Argonauts": entrepreneurs born abroad and educated in the USA who return to their countries armed with their knowledge and global contact lists. These entrepreneurs and their remote networks play an essential role in expanding knowledge and globalising innovation, contributing to the economic growth and development of their regions.

Developed countries, especially the USA, have benefited from the immigration of young people with talent. This phenomenon is at its most evident in Silicon Valley. Thousands of people from other countries who come to take a course end up never returning home. This "brain drain" has aggravated the imbalance between countries. However, reductions in communication and transport costs, together with greater opportunities in their countries of origin, are changing the situation. Qualified workers are going back home to set up commercial relations and create new companies while maintaining their social and professional links with developed countries. Nearly 50% of Chinese and Indians surveyed stated that the opportunities for entrepreneurship are better in their country than in the USA[56]. What used to be just a one-way process has become reversible. The "brain drain" is become a "brain circulation"[57]. These new Argonauts, with their skills, have the cultural and linguistic knowledge to capitalise on the opportunities for collaboration between the different countries.

Peter Drucker said that "Knowledge is not impersonal, like money. Knowledge does not reside in a book, a database, a software program; they contain only information. Knowledge is always embodied in a person; carried by a person; taught and passed on by a person; created, augmented, or improved by a person; applied by a person; used or misused by a person. The shift to the knowledge society therefore puts the person in the centre. In so doing it raises new challenges, new issues, new and quite unprecedented questions about the knowledge society representative, the educated person."[58]. The new Argonauts play a basic role in the globalisation of innovation within this new society. They acquire the technical knowledge, the knowledge of management, of venture capital, etc. But, above all, they are not averse to taking risks. They identify the opportunities and pursue them, assuming the inherent risks. A culture that does not tolerate risk or failure is one of the main barriers to innovation, and the new Argonauts can be the seed needed to change that.

Everything revolves around people, whether they are the new Argonauts or the other inhabitants of a region or country. According to Po Chi Wu, executive director of the Global Innovation Research Center at the University of Peking, co-founder and CEO of DragonBridge Capital and FTF expert, innovation ultimately consists of two things: problem solving and people. On the one hand, it is a question of finding solutions to problems, whether they are related to poverty or to high-tech. But, at the same time, it depends on the action and interaction of people, their will and their motivations. There are many different ways of behaving as a person; innovation is a mechanism for developing personal character — in other words, of showing yourself as a person.

[56] "Why skilled immigrants are leaving the US", *Business Week* (2/03/2009).

[57] Annalee Saxenian, *The New Argonauts: Regional Advantage in a Global Economy*, October 2007.

[58] http://www.corporatesolutionsinc.ca/lib-documents/The%20Essential%20Drucker.PDF.

3.5. The cup of coffee test: the social networks that drive innovation

As we have seen, commitment to innovation means having the right people doing the right thing at the right time. We have talked about the roles and characteristics of the right people, but, what about "doing the right thing at the right time"? An answer to this question can be found in the well-known story of the origins of Southwest Airlines [59]. Founders Rollin King and Herb Kelleher are supposed to have drawn the business concept out on the back of a paper napkin in a bar. The moral of the story is that it is impossible to know in advance what the right thing is and when the right time has come. Google, one of the most innovating companies in the world, knows this lesson well, and its employees can spend 20% of their time –a day a week!– working on projects that are not part of their job description[60]. With this 20% of the time Google wants its staff to generate ideas. And it appears to be working, since nearly half of Google's new products come from ideas generated in that 20% of the time[61].

However, having time available to think is not the only requirement for generating ideas, especially if you want those ideas to lead to innovations that contribute value. And in Google they know that too. This is why they go on skiing trips together and have shared zones to boost informal contacts[62]. Feras Abu Ibrahim, policy advisor at the office of the Prime Minister of the United Arab Emirates and FTF expert, calls this the "cup of coffee test". In his experience in setting up the Emirates Competitiveness Council (ECC)[63], founded to promote competitiveness, whenever they asked entrepreneurs to tell them where their innovations came from, a cup of coffee always came into the story. Why? Because many of the ideas that give rise to innovations do not arise in the work routine, but during informal conversations and, in the West, these conversations tend to be held in the coffee room.

The cup of coffee test seeks to assess the context in which innovation takes place within a company or region; who is talking to whom, where and when. In a company, the right context may consist of a conversation between the president and a new employee. The company therefore has to create the right conditions for employees to meet and strike up relations. But what does that mean in the context of a region? What does the coffee cup become at a national scale? Innovation centres or clusters can offer some answers.

Regional coffee rooms: the innovation clusters

Why do such dynamic regions as Silicon Valley keep growing despite their high costs? Videoconferencing enables two people in different parts of the world to talk face to face and new logistics and transport systems allow products to be shipped around the globe at very low cost. However, entrepreneurs keep coming to innovation centres despite the additional costs involved in setting up there. Technology cuts distances, but innovation keeps concentrating, because relationships are essential to innovation. And according to Tim Rowe, CEO of the Cambridge Innovation Center [64] and FTF expert, distance matters.

The model of vertical integration that characterised post-war companies is now giving way to specialisation. Companies are focusing on specific functions in the value chain and increasingly depend on collaboration with other companies to bring innovative products and services to market. What clusters like Silicon Valley can offer is a perfect breeding ground for developing that collaboration. Proximity

[59] http://findarticles.com/p/articles/mi_m4070/is_1999_Oct/ai_57590699/.

[60] http://googleblog.blogspot.com/2006/05/googles-20-percent-time-in-action.html.

[61] http://www.lostremote.com/2010/07/14/20-percent-time-the-way-to-innovate/.

[62] http://www.ted.com/talks/lang/eng/sergey_brin_and_larry_page_on_google.html.

[63] http://www.ecc.ae.

[64] http://www.cictr.com/.

encourages both the personal relations and the informal conversations that turn ideas into innovation. Research by Thomas J. Allen, professor of management and engineering systems at MIT found that there was an inverse relationship between distance and frequency of communication between individuals[65]. The importance of this communication in the innovation process means that the benefits of proximity offered by such centres more than makes up for the additional costs.

Many ideas start out on the road to innovation in these informal conversations and relations, with people as the true protagonists in the process of generating ideas. Availability of talent, therefore, is another factor that attracts companies to clusters. This is positive feedback. Talent is also attracted by the opportunities offered by firms in the region, since entrepreneurs can venture into new business without putting their careers on the line. Some of these businesses are successful and others aren't, but the talent is not wasted. It is successfully reintegrated into other companies. *Flexicurity*[66] —a concept that advocates offering not job security but employment security— comes naturally in these regions. Lack of success in a business venture does not harm the entrepreneur's career and the region prospers. According to Annalee Saxenian, this is an "open talent market". Personal knowledge and relations are not owned by any one firm, but move around with people, from company to company, enriching the whole region. The social networks expand, strengthening innovation, but they also play another role; they help attract the funding needed for innovation.

Financing innovation: the function of venture capital

One of the great problems faced by innovation is funding. Innovation involves uncertainty and, consequently, risk. A promising idea that ticks all the right boxes may fail if it is not accepted by the market. As a result, the sources of financing that are available to large companies, such as financing from banks or capital markets, are not available for small companies and start-ups with new business ideas. Any new business venture requires initial investment before it can produce profits, but traditional creditors are not prepared to assume the risk involved in this investment. This initial period in which the company faces losses is known as the "Valley of Death" (see Illustration 15). It requires financing that is prepared to take the risk, and this is where private equity or venture capital comes in.

The life cycle of a new company begins with the identification of a business opportunity, i.e. when an idea is translated into a feasible business plan. This initial funding generally comes from what is known as the three F's: friends, family and founders — also known scathingly as friends, family and fools. Steve Jobs and his business partner, Steve Woznicik, sold their VW and a programmable calculator to stump up the 1,350 dollars they needed to build the first Apple computer in a garage in 1976[67]. And the co-founders of Hewlett-Packard, Bill Hewlett and Dave Packard began working together in a garage with an initial investment of 538 dollars[68]. At this first stage the entrepreneurs draw on their own funds and tap their personal relations to obtain the finance, whether it consists of the small investments of the examples above, or the twenty million pounds the Ryan family sank into setting up Ryanair[69].

Personal and professional relations can be a determining factor in setting up a business. As a result, universities and business schools place a lot of emphasis on alumni networks. Contacts built during a person's time in higher education have led to important innovations. The founders of both Google (Larry Page and Sergey

[65] http://mitsloan.mit.edu/faculty/pdf/interaction.pdf.

[66] Suárez Ruz, E., Pin Arboledas, J. R. (coordination: Ángela Gallifa Irujo), *Tendencias innovadoras en la dirección de personas: de la flexibilidad a la flexiguridad,* Eunsa, November 2009.

[67] Andrew J. Sherman, *Raising capital: get the money you need to grow your business.*

[68] Andrew J. Sherman, *Raising capital: get the money you need to grow your business.*

[69] http://www.ryanair.com/ie/about.

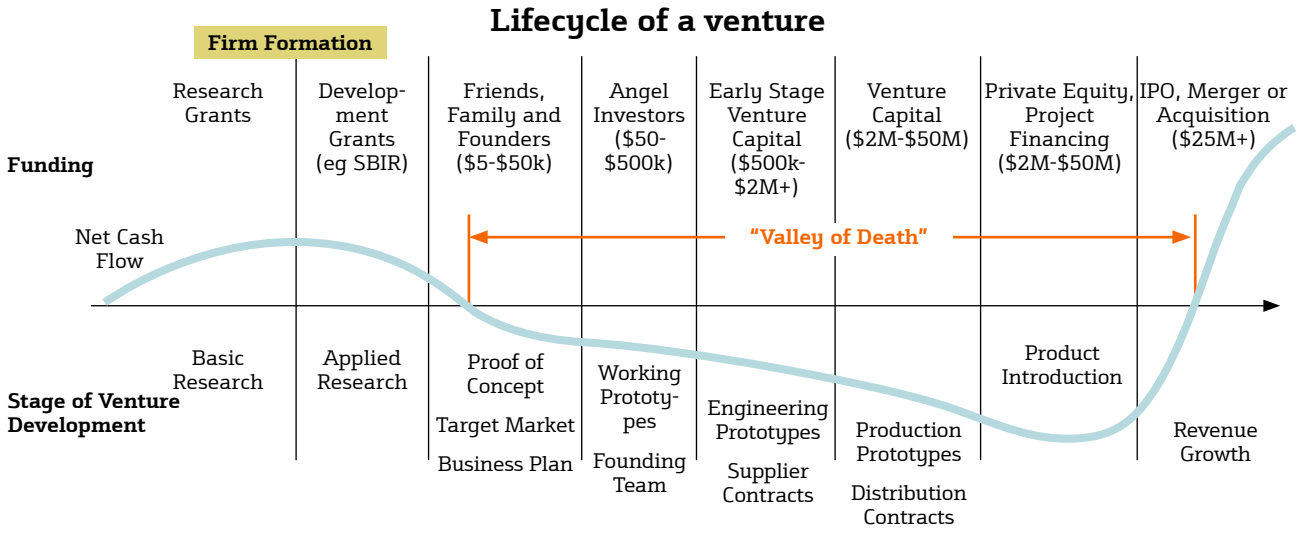


Illustration 15: The initial life cycle of a company.
Source: UCDavis, Center for Entrepreneurship.
http://andrewhargadon.typepad.com/my_weblog/2010/04/into-the-valley-of-death.html.

Brin) and Hewlett-Packard met during their time at university in Stanford. But there are other ways of encouraging links between entrepreneurs. These include incubators, such as the Cambridge Innovation Center in Massachusetts, which offers first-class facilities and services to start-ups and growing companies, while at the same time offering professional networking opportunities. By bringing several entrepreneurs together under one roof, the incubators not only become a meeting point for talent, but also for business angels and venture capitalists, who can offer funding at later stages of the company's life cycle.

Business angels and venture capitalists are the fuel of innovation. They act as a bridge across the "Valley of Death", by providing the capital that allows companies to get past the initial loss-making period. They are looking for higher returns than traditional creditors —banks and shareholders— and are therefore prepared to assume greater risks. Development of the venture capital industry is essential for strengthening innovation in a region. Investors do not get the innovation engine started, but, once it's running, they provide the fuel to keep it going[71]. Nonetheless, their functions need not be limited to providing finance. Private investors are also involved in management, either by helping entrepreneurs with their own experience or making use of their extensive network of contacts.

The FTF experts consider innovation funding to be the most important item in any policy for encouraging innovation (see Illustration 16). Nonetheless, rather than directly financing innovation, the experts feel that governments should aid development of the venture capital industry and the networks of business angels in the region or country. They will be in charge of providing private financing for innovation; by risking their own capital, they have the necessary incentives to promote truly interesting innovations.

[70] http://www.cictr.com/.

[71] Masako Ueda and Masayuki Hirukawa, *Venture Capital and Innovation: Which is First?*, September 2008.

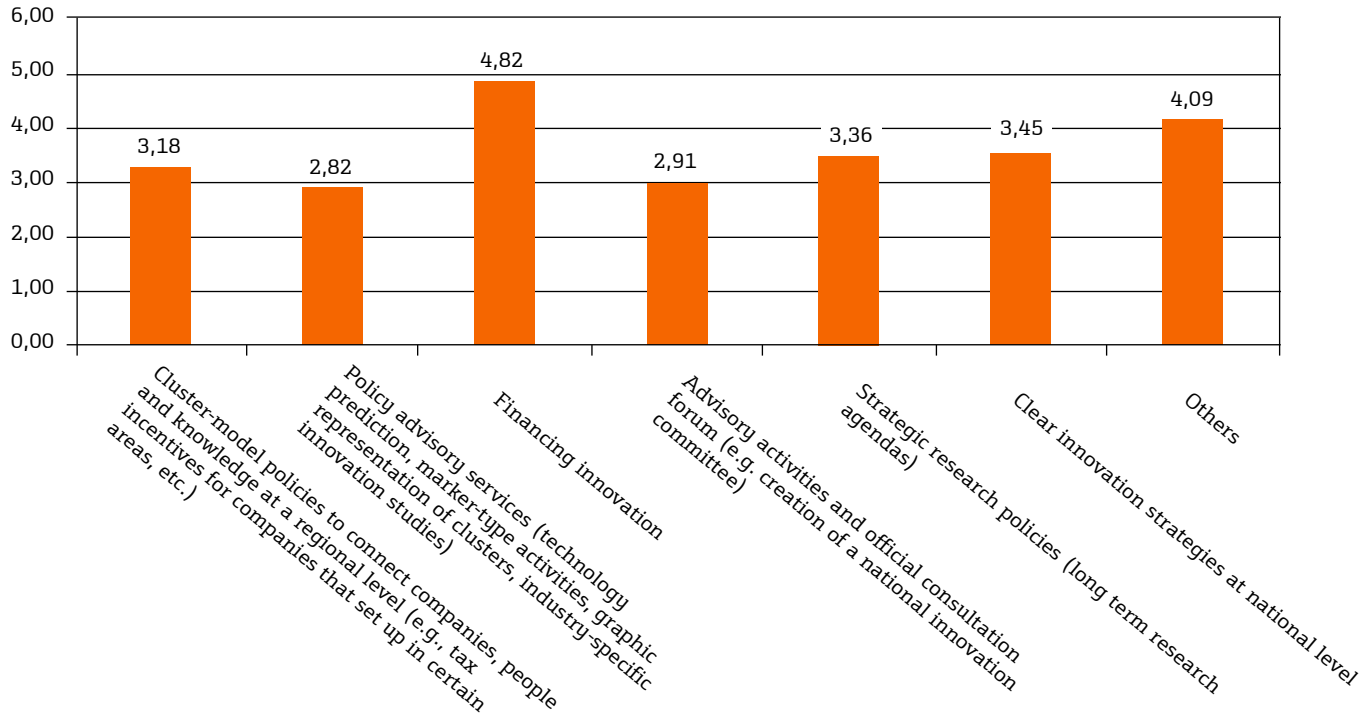


Illustration 16: How important are the following elements related to the Governance and innovation policies of a country to improving the level of national innovation?
Source: Authors.

Specialisation in innovation

Business specialises and so does innovation. Silicon Valley is the cradle of innovation — but it's technological innovation. New York is the centre of financial innovation, Bangalore the heart of innovation in software development and the north of Italy in innovation in the footwear industry (Illustration 17 shows examples of other clusters around the world). Companies and entrepreneurs seek the best opportunities around the world for setting up business and their location will depend on a range of characteristics in the regions concerned. For example, it costs very little to transfer information. As a result, the decisive factor in software development is access to talent at a lower cost. With its plentiful supply of skilled engineers and low wages, Bangalore has become a magnet for software companies. This is what John Kao, innovation consultant and chairman of the Institute for Large-Scale Innovation, calls "innovator arbitration"[14], i.e., capitalising on differences in regulations, and the cost of talent, specialist services and other features of the regions in the innovation process.

However, clusters are not independent centres of innovation. Increasingly, they also depend on each other. Silicon Valley concentrates the talent that originated great technological ideas, but translating many of those ideas into innovation is dependent on links with Bangalore to develop the software and Taiwan for manufacturing the microchips. The specialisation of these centres has brought what Annalee Saxenian calls the "globalisation of the supply chain". New companies can access the global market from anywhere in the world, not only from the main innovation centres. Location is a help, but it does not determine a

[14] John Kao, *Tapping the world's innovation hot spots*, March, 2009.

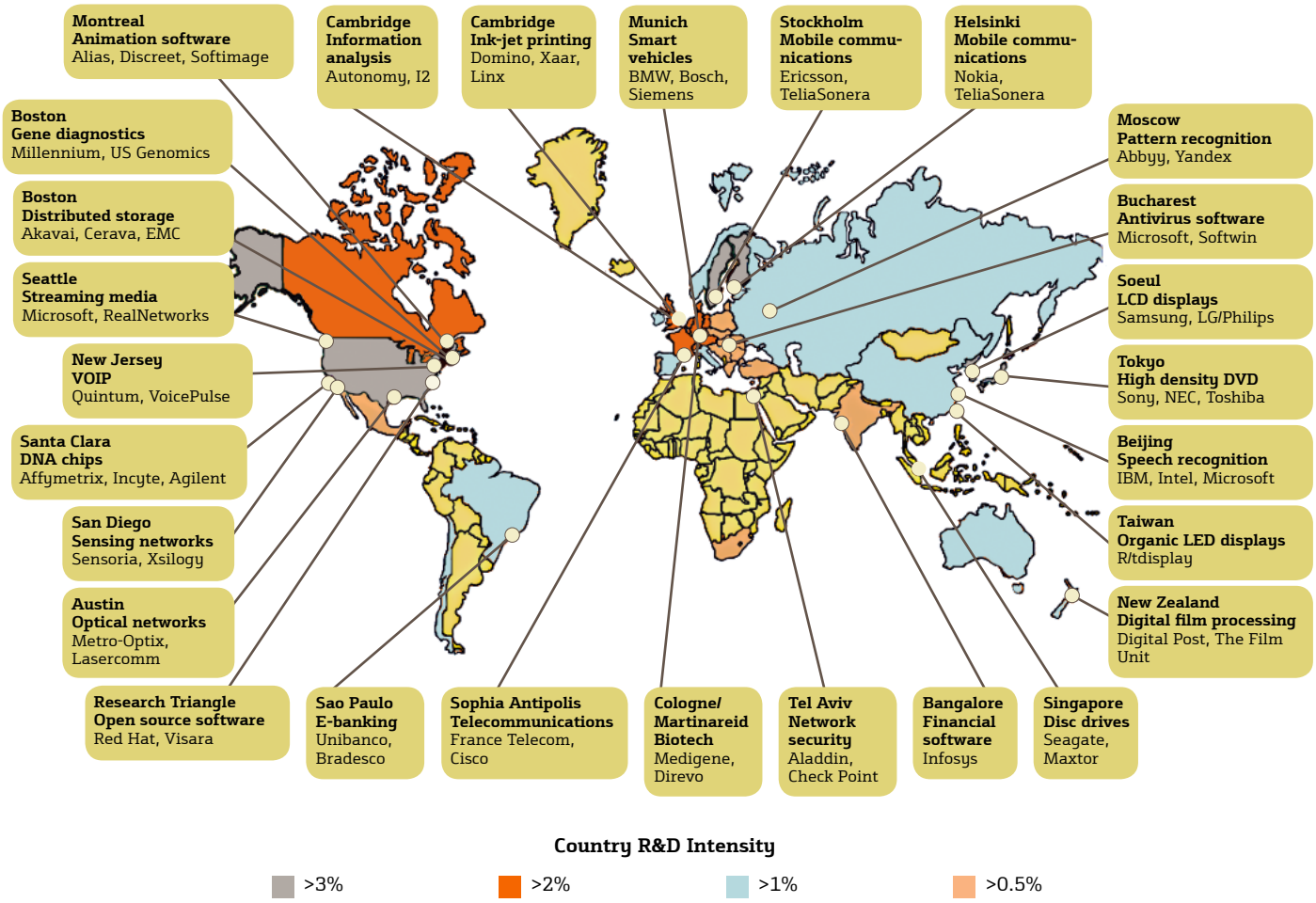


Illustration 17: Global innovation clusters, core technologies and key companies.
Source: URENIO.
http://www.urenio.org/2006/08/12/global-innovation-clusters/.

company's success. The success of businesses that identify a niche in the value chain lies in identifying the location that will allow them to be efficient in that niche and partnering other components in the chain as effectively as possible. This involves a global search network, an ability to scan the world for resources and capacities that complement the company's own. Nonetheless, this world no longer consists only of countries and regions, but also includes social networks and the rest of the Internet.

Innovation is concentrated, but the Internet and social networks are creating another type of concentration, in which physical distance gives way to virtual distance. Groups of people from all over the world with common tastes come together on the networks to share ideas. *Crowdsourcing*, in which innovation is seen as an open system involving agents inside and outside an organisation, is in vogue at the moment. The constraints imposed by physical distances are breaking down, freeing up the innovation capacity distributed around the world. This may lead to the emergence of other innovation centres, future clusters in the virtual world. Facebook, the largest social network on the net is the leading candidate. Silicon Valley needs to be alert, because its throne may be in under threat.

The social challenges are too complex to be resolved independently by non-profit organisations

3.6. Innovation and solidarity: social responsibility in the innovation process

Innovation is profitable and it is an essential factor for economic growth. An increasing number of companies are now becoming aware of this and innovate under suitable conditions. The function of governments is to pave the way for companies. However, there is a different form of innovation that requires another type of attention. This innovation may not be profitable in financial terms, but it is worthwhile in social terms. For this reason, the market, which is obliged to obtain purely financial profits, tends largely to ignore it. Solving these problems requires help from governments and other non-profit organisations, such as foundations and non-governmental organisations (NGOs).

Larry Keeley, CEO of the Doblin group and FTF expert, says that adversity can be a source of innovation. The important thing is to turn it into competitive advantage, since nobody knows more about a problem than the person who faces it head on. The day-to-day running of foundations and NGOs consists of coming up with answers to adversities. Such organisations face major problems, such as combating poverty and eradicating malaria, and they have to go about it with very limited resources. According to Bill Gates, "There's more money put into baldness drugs than are put into malaria"[73]. As a result, foundations and NGOs have to be very efficient in their use of resources if they are to resolve these big problems. They need innovation.

These institutions play a very broad role in innovation. In some cases this involves setting a target, such as the One Laptop Per Child mission, a non-profit organisation which aims to create a low cost portable computer that can be afforded by all the world's children between six and twelve years [74]. Once this goal has been established, innovation within the organisation is the medium whereby it is achieved. However, these organisations may occupy another place in the process, playing the same role as venture capital — but a type of venture capital that finances social innovation. The Gates Foundation is an example[75]. Social projects compete for their funds and are measured on the basis of performance. Because it involves innovation, the indicators measure the results of the projects financed, i.e., the value creation. But it is not an economic value but a social one.

Creative capitalism or open social innovation

However, social innovation is not only attributable to non-profit institutions. The social challenges are too complex to be resolved independently by this industry. Over recent years, there has been growing consensus on the importance of bringing other agents into this social action. Bill Gates, in his speech to the World Economic Forum defined it as *creative capitalism*[76]. In his own words:

> "There are two great forces of human nature: self-interest, and caring for others. Capitalism harnesses self-interest in a helpful and sustainable way, but only on behalf of those who can pay. Government aid and philanthropy channel our caring for those who can't pay. But to provide rapid improvement for the poor we need a system that draws in innovators and businesses in a far better way than we do today.
>
> Such a system would have a twin mission: making profits and also improving lives of those who don't fully benefit from today's market forces. For sustainability we need to use profit incentives wherever we can. At the same time, profits are not always possible when business tries to serve the very poor. In such cases there needs to be another

[73] http://www.ted.com/talks/lang/eng/bill_gates_unplugged.html.

[74] http://laptop.org/en/.

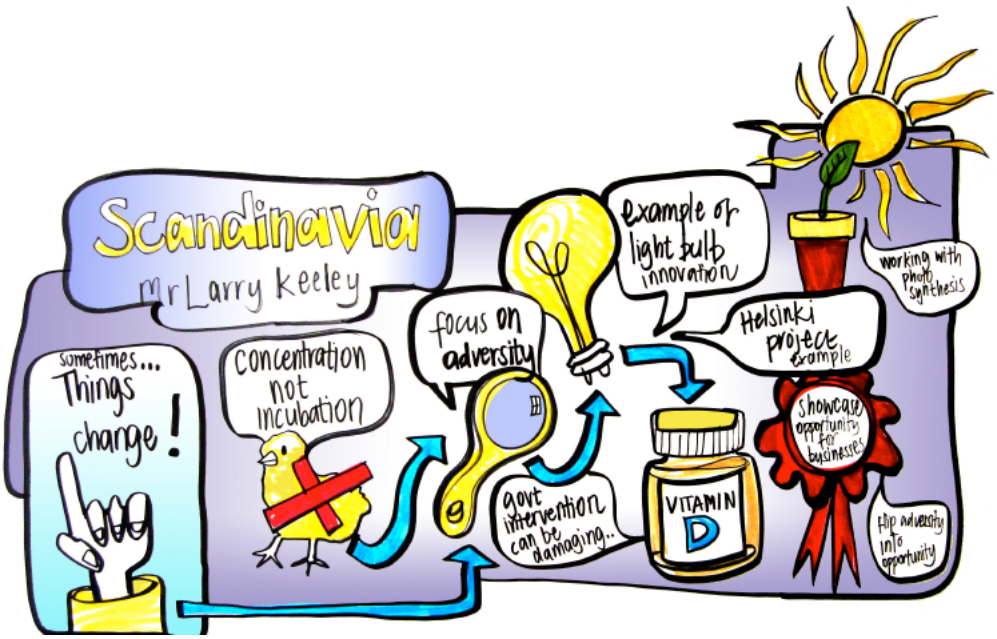
[75] http://www.gatesfoundation.org/.

[76] http://www.microsoft.com/presspass/exec/billg/speeches/2008/01-24wefdavos.mspx.

> incentive, and that incentive is recognition. Recognition enhances a company's reputation and appeals to customers; above all, it attracts good people to an organization. As such, recognition triggers a market-based reward for good behaviour. In markets where profits are not possible, recognition is a proxy; where profits are possible, recognition is an added incentive.
>
> [...] The challenge here is to design a system where market incentives, including profits and recognition, drive those principles to do more for the poor.
>
> I like to call this idea creative capitalism, an approach where governments, businesses, and nonprofits work together to stretch the reach of market forces so that more people can make a profit, or gain recognition, doing work that eases the world's inequities."

Creative capitalism is another way of looking at open social innovation (see the Twelfth Future Trends Forum Publication, *Social Innovation: Reinventing Sustainable Development*) which advocates closer collaboration between all the agents involved. It requires a commitment by all stakeholders to apply innovative, scalable results-oriented business solutions to resolve social and environmental problems. This is why greater collaboration is needed among the social partners that will translate into cooperation to introduce initiatives, consistency between processes, compatibility between the tools used and common development of new financing methods.

However, according to C.K. Prahalad, the main question is "How do we bring to bear the entrepreneurial and innovative energy of private enterprise to resolve the critical problems facing humanity?"[77], and here social entrepreneurs have an essential role to play. These are people who recognise the existence of a social problem and venture to create a company that will help solve that problem; people with a different perspective on poverty, who treat the people they are trying to help as customers and consumers, not as aid beneficiaries. They are looking for



Source: Illustrations resuming Future Trends Forum's presentations.

[77] *The Fortune at the Bottom of the Pyramid, Revised and Updated 5th Anniversary Edition: Eradicating Poverty Through Profits* by C. K. Prahalad (Hardcover - Sep 3, 2009).

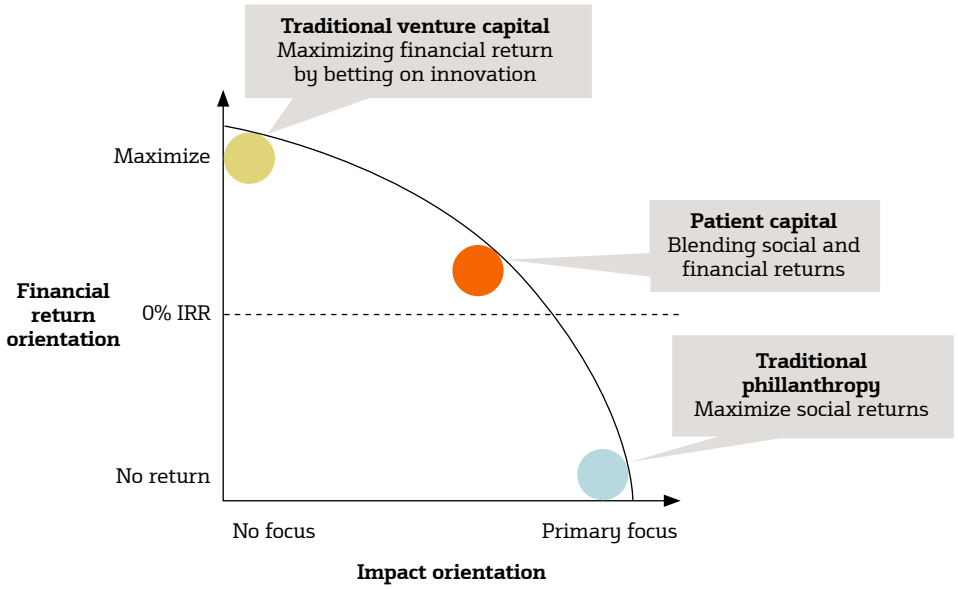


Illustration 18: Patient capital.
Source: Wikipedia.

solutions to these people's real needs, innovating to offer what they are actually asking for, not what others think they need.

According to Jacqueline Novogratz, founder and CEO of the Acumen Fund, a global venture capital fund that uses the approaches of entrepreneurs to tackle the problems of global poverty, these entrepreneurs need *patient capital*[78], i.e., capital with a high tolerance of risk and a very long term horizon that seeks smaller profits than those offered by the market but with a very large social impact (see Illustration 18).

The agents of social action are increasingly aware of the need for sustainable models in both market and social initiatives. On the one hand, many companies are no longer setting their sights merely on maximising profit for shareholders, and are also looking for social benefit. At the same time, non-governmental and non-profit organisations are adopting business practices that will improve their income and are participating more actively in a goods and services market. The fundamental characteristic is the search for sustainability and economic autonomy. We are beginning to see the emergence of the so-called "fourth sector"[79], hybrid organisations that combine practices and strategies from public, private and social sectors, using the practices of business for social ends.

[78] http://www.ted.com/talks/lang/eng/jacqueline_novogratz_a_third_way_to_think_about_aid.html.

[79] *The Emerging Fourth Sector,* ©1998-2008 Fourth Sector Network.

4 The new coordinates of innovation

- The role of developing countries in innovation
- Innovate or die: innovation in developed countries
- The perfect recipe for an innovating ecosystem

As Henry Ford II continued to dismiss Japanese cars as "those little shitboxes", Toyota was gradually taking over the American automobile market[80]. Developing countries today are to some extent where Japan was in the post-war years, but unlike the great automobile manufacturers of the time, today's western companies are striving to innovate in these new markets and to tap into their potential.

American companies are still the most innovative, but the times are changing. Globalised communications and transport have simplified international trade and many new companies are now 'born global', setting up first in the country, community or region that best suits their interests. At the same time, large corporations are dividing their operations up amongst different countries, to make the most of the best local conditions. Governments around the world are competing to build the most favourable environment for business. Where has this change in the attitude of governments —traditionally concerned with protecting their markets— suddenly sprung from? The main factor is globalisation, but one of the chief drivers of change may have been the World Bank's report *Doing Business*[81]. Since 2003, the report has been raking countries by how easy it is to do business in them. It performs two functions: to reflect in hard figures what were previously only vague impressions, and to furnish citizens and investors with comparative statistics on their own country and another 180. Since the first report was published, the countries have been competing furiously to scale the list by promoting reform, learning from each other and benefitting the global economy[82].

However, developing countries are not limiting themselves to improving the conditions for business; they are also embracing innovation. Political reforms are backed by large investments in education and R&D. And whereas the crisis is restricting prospects in the developed world, opportunities are multiplying in developing economies. All of these opportunities, together with the sheer scale of countries such as China and India is leading them to adopt a model of innovation which Po Chi Wu, Executive Director of the Global Innovation Research Center at Peking University, director of DragonBridge Capital and FTF expert, calls "chaotic pragmatism". They are experimenting with a broad spectrum of possibilities, boosting those that are successful and dismissing and ultimately ignoring those that fail. The Tata Nano car, with a price tag of around 2,500 dollars[83], and the Haier washing machines, designed to wash vegetables[84] are examples of the results of these experiments.

But we should not forget the developed countries. One feature of success in innovating countries is that when faced with adversity, they make use of their strengths and act with courage in seeking out new opportunities. The West has a long tradition of reinventing at times of difficulty, as the period following the Second World War shows. The developing markets may be catching up on the West, but overtaking the US in the innovation race is not the same thing as overtaking a Ford in a Toyota.

4.1. Reversing the course of innovation: the role of developing countries

Developing countries are in vogue. Check the small print on any product you buy and it's liable to mention China, India, Taiwan or Vietnam. Phone a multinational's call centre, and the voice at the other end is likely to have an Indian or an

[80] "The power to disrupt. A special report on innovation in emerging markets", *The Economist*, 17 April, 2010.

[81] http://www.doingbusiness.org/.

[82] "An idea whose time has come. A special report on entrepreneurship in emerging markets", *The Economist*, April 17th 2010.

[83] http://articles.moneycentral.msn.com/Investing/Extra/WorldsCheapestCarArrivesTomorrow.aspx.

[84] http://blogs.ft.com/donsullblog/2009/09/26/innovation-lessons-from-emerging-markets-live-with-your-customer/.

Argentinean accent. Developing countries are a source of cheap labour and western firms have jumped on offshoring and outsourcing in these areas as a way of cutting costs. But that's only one side of the coin. To view these countries as simple sources of cheap labour would be to see just the tip of the iceberg and forget everything else under the waterline. The American auto industry made the mistake of ignoring its Japanese competitors for many years. General Motors' petition for Chapter 11 bankruptcy protection is ample proof of how wrong they were[85].

Japan, devastated by the Second World War, embarked on a process of industrial transformation which would lead the country to become the second wealthiest country in the world. The foundations of this transformation did not consist of small, cheap cars, though Toyotas were certainly smaller and cheaper than their rivals from Ford and General Motors. The real pillar of Japan's growth lay with innovation in business processes. The Japanese imported American production systems but they didn't just copy them; they transformed them to adapt them to their own needs and characteristics. With a geographically small land area and limited natural resources, the Japanese had to look for a way of cutting inventories. The answer was the 'Just-in-Time' production system, which allowed them to achieve this goal while maintaining service levels, thanks to a vision of the organisation as a wider group that includes providers and customers[86]. Japan turned adversity into competitive advantage and is now an example of efficiency to the rest of the world. Toyota's production system is studied at the world's most prestigious business schools[87].

The large developing countries appear to be going in the same direction. Over recent decades they have been receivers of technology and knowledge. Large western companies have transferred part of their manufacture and their support systems to these countries to reduce costs. And in the process, the developing countries have learnt much. They are a source of top-of-the-range imitations that only experts can tell from the originals. However, although copying is still a major factor, imitation is giving way to innovation. The skills acquired in the processes of offshoring from the West are being complemented by government with major investment in R&D and education. And like post-war Japan, the knowledge acquired is being adapted and improved to tackle their principal problems. Gradually, these adversities are being turned into a competitive edge over the West. The innovation map is changing.

Japan, with over 100 million inhabitants and a smaller land area than California —much of it covered in forest[88]— defied its problems of space with Just-in-Time. Developing countries face different challenges, but of a similar or greater size, and these challenges are the source of many of their innovations. Po Chi Wu identifies China's greatest areas of adversity and opportunity as being scale, accelerated rate of change, proactive government, growth of the middle class and technology (see Illustration 19.). These areas are not specific to China; to a great extent they are shared by all developing countries.

Large-scale innovation

When we speak about developing countries, we always think first of China and India. With over a billion inhabitants each, the two countries have more than the population of Europe and North America put together. When Po Chi Wu talks about scale, this is exactly what he is referring to, the size of the population. Gaining access to a market of billions of people is a challenge in itself, but if you add the low

[85] http://www.telegraph.co.uk/finance/newsbysector/transport/general-motors/5421879/GM-files-for-Chapter-11-bankruptcy-protection.html.

[86] Kee-hung Lai and T.C.E. Cheng, *Just-in-Time Logistics,* 2009.

[87] Steven Spear and H. Kent Bowen, "Decoding the DNA of the Toyota Production System", *Harvard Business Review,* 1999.

[88] http://www.jnto.go.jp/eng/indepth/about/overview/index.html.

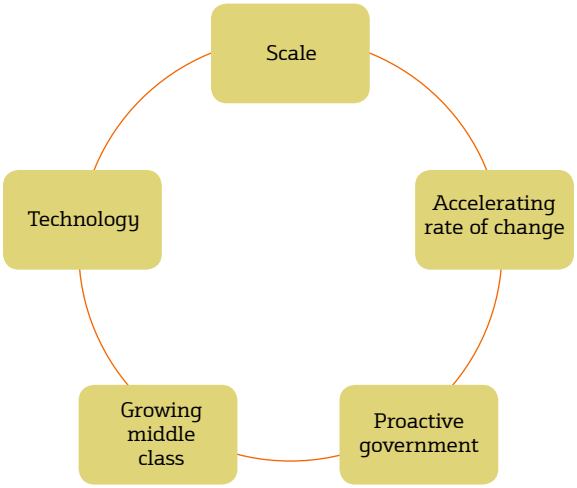


Illustration 19: Adversities and opportunities of China.
Source: Presentation by Po Chi Wu at the Future Trends Forum.

purchasing power of much of that population, the problem faced by companies becomes even bigger. The scale of the markets and the low wage levels require a different approach to the western one. It is not only necessary to rethink the products, services and distribution systems; these markets require new business models.

Seeing products like the iPad, we tend to think that innovation consists of new products or services targeted at an elite that eventually filter down to the average income earners. But many of the most important innovations consist of small improvements in existing products and processes targeted at the middle or bottom of the income pyramid. IKEA, with its low-costs modern-design furniture; Walmart, with its excellent supply system and Dell, applying the Just-in-Time production system to personal computers, all revolutionised the market with innovations aimed at these sectors. From there, they have taken the opposite direction. Although originally targeted at the lowest-income population, they have found a place among higher income groups thanks to the quality of their products. Developing countries certainly have a lot to say about this type of innovation.

The Chinese and Indian economies are taking giant steps forward. Their populations are fast getting richer, but the average wage is still very low by western standards[89]. Poverty is part of everyday life and corporations are adapting their products and services accordingly. Adapting products to match the budgets of consumers in developing markets is no new idea. Unilever, a multinational consumer goods manufacturer, offers its products in small bags to make them more affordable for these consumers[90]. These consumer's earnings are very low and very volatile. They live from one day to the next and a Western-size bottle of shampoo or box of detergent represents an important investment which they cannot afford. Offering the product in small one-day packages is one way of gaining access to this population. It means they can wash their hair or clothes on days when their income allows, but don't have to go without bread or rice for several days to save up for a half-litre bottle.

But some companies are taking a different approach. Instead of playing around with their traditional products to introduce them onto developing markets, they are basing themselves on the needs of poorer consumers and working in the opposite

[89] http://data.worldbank.org/indicator/NY.GNP.PCAP.PP.CD.

[90] http://www.unilever.com/sustainability/economic/affordable/.

Reducing costs to a minimum is forcing companies to completely rethink, not only their products, but also their business models

direction. This does not mean innovating in the resulting product, since the needs are already known. It means innovating in the manufacturing process, distribution system and business models. This is what has been called "reverse innovation"[91]. In this type of innovation, "new and improved" means "simpler and cheaper"; keeping just the essential, getting rid of the rest, but without foregoing suitable standards of quality. The resulting products must not only be cheap; they have to be resistant, given the bad conditions of the infrastructures in these consumers' environments, and user-friendly, so they will be well received amongst a population with little technological knowledge.

There are plenty of examples of this new type of innovation. Godrej & Boyce, an Indian manufacturer of domestic appliances, has developed the Chotukool. This is a 69-dollar fridge targeted at the Indian rural population[92]. Many people lack reliable electricity infrastructures, and so the refrigerator can run off a battery. It also has a high-quality insulation system and a cooling system equivalent to that of a PC (instead of a traditional compressor), reducing power consumption as compared to a standard refrigerator. The Chotukool brings refrigeration to the rural population, which with this new system can keep vegetable and water fresh for a considerably longer time.

Reducing costs to a minimum is forcing companies to completely rethink, not only their products, but also their business models. Joseph Silva, founder of Tanaji Malusure City (TMC) and an FTF expert, explains the business model of TMC, a project to build affordable homes for the poor. TMC set a target price of 20 dollars per square metre and explored different construction methods in countries around the world. With cheap production costs and a mixture of residential and commercial sales, TMC can offer small homes at prices of between 4,000 and 10,000 dollars. In its first project, TMC found demand far outstripping supply. This surplus demand was in danger of causing an increase in the price of the second-hand homes. To prevent this from happening, TMC plans to increase the supply with new projects. TMC's mission is to "build cities for poor people", and price rises are not an option. Nonetheless, TMC makes a profit. Low margins per home are made up for by large turnover.

Bharti Airtel, an Indian mobile phone operator, is another leading example[93]. The operator had to invest large amounts of money in infrastructures. As a result it was charging its subscribers high rates. It soon realised that this traditional model, characteristic of western countries, was out of place in India. Bharti Airtel substituted the sector's management indicator *par excellence*, the ARPU (average revenue per user). Although the ARPU was low, the company could achieve important earnings by registering millions instead of thousands of users. Bharti Airtel began operating as a wireless voice minute factory, and as a result had to slash its prices. Because this is a capital-intensive industry, the operator avoids resorting to financing by outsourcing the great majority of its functions and infrastructures. But it also obliges its members to rethink the type of subcontract, linking payment to indicators that align the supplier's goals with the operator's.

These Indians companies and their equivalents in other developing countries are not just facing a problem of scale. According to Po Chi Wu, developing countries are changing at an accelerated rate. Their economies are growing constantly; each year millions more people improve their economic standing and can afford the products on offer. With millions of potential new customers each year, companies whose business is based on volume have to be very flexible. Adapting quickly to

[91] "First break all the rules. The charms of frugal innovation. A special report on innovation in emerging countries", *The Economist*, April 17th 2010.

[92] http://www.business-standard.com/india/news/godrej/s-nano-chotukool/377275/.

[93] "Innovation's Holy Grail", C.K. Prahalad and R.A. Mashelkar, *Harvard Business Review*, July-August 2010.

new conditions gives access to a greater number of customers. Greater volume also makes it possible to adjust prices, and thus access even more customers.

How do companies achieve this flexibility? Amul, an Indian raw milk processor, does not have large herds of cattle. Its milk comes from 2.2 million farmers in around 10,000 towns[94]. Although many of these farmers only have one or two cows, in aggregate they form the largest herd in the world. Amul situates collection points in the towns and processes the milk centrally. With a very sophisticated logistics system and payment to the farmers based on the quality of the milk, Amul has avoided the problems of managing large herds. Through decentralised supply and centralised processing, Amul has created a virtual scale that can be extended to meet its needs. The same is true of Li & Fung, a global trading group based in Hong Kong. The company uses the concept of flexible networks[95]. Working with a network of 12,000 companies in 40 countries, Li & Fung can adjust its supply chain to demand, and rarely has problems of overcapacity in hard times or waiting lists in the boom years.

But, whereas Amul and Li & Fung have flexibilized supply, other companies did the same for their distribution network. Unilever, for example, has developed a huge network of *Shakti Ammas* in India, local women entrepreneurs who give education and distribute their products[96]. This network constitutes a variable cost distribution system. It removes the need to invest capital in expanding distribution channels. But, above all, the Shakti Ammas provide an understanding of the local market. The billions of people at the bottom of the pyramid are not a homogenous mass. They are sophisticated consumers with very different tastes, and they therefore need more personalised treatment. The large American shopping centres have yet to find a place in much of this market.

A proactive government

Developing countries offer many opportunities, but they are not without risk. In addition to the difficulties associated with scale and low wage levels there is another element — government. Bureaucracy, restrictions and interventionism are not only a feature of the Chinese administration. The governments of developing countries with democratic systems also bring great influence to bear on business. The good news is that these governments appear to be embracing innovation. They seem to understand that sustainable competition cannot be based on low wages. As the economy grows, wages rise. A country that is competitive now in terms of costs, will cease to be so in a few years' time. With the potential of the African continent still untapped, Asian countries are readying themselves. They are making major investments in R&D and new technologies, but above all in education. Each year 75,000 new engineers and computer scientists graduate in China and 60,000 in India[97]. These measures have a clear goal, to prepare for the battle of the future, the battle of innovation.

All these efforts targeted at promoting innovation might lead one to think that it is the governments that are responsible for much of the innovation to be seen in Asia. Nothing could be further from the truth. Innovation comes from business and will continue to do so. As we have already mentioned, the function of government is to pave the way. In China and India, these ways are not tarmac roads, but earth tracks with stones and potholes, which these initiatives are intended to repair. Business has long learned to cope with these potholes, many caused by the governments themselves. In India, an authoritarian system known as the "Licence

[94] *The fortune at the bottom of the pyramid*, Prahalad, 2009.

[95] *The fortune at the bottom of the pyramid*, Prahalad, 2009.

[96] *The fortune at the bottom of the pyramid*, Prahalad, 2009.

[97] "The world turned upside down. A special report on innovation in emerging countries", *The Economist*, April 17th 2010.

Raj" slowed creativity and innovation in most sectors of the economy for decades. However, the software industry gets around this control and the bureaucracy imposed by the government. The bureaucrats were unaware of the nature of the industry and by the time they got round to trying to regulate it, Indian entrepreneurs, especially in Bangalore, had created a world-class industry[98].

Despite the introduction of democracy in most developing countries, there is still a hang-over from the days of interventionist government. Legislative change takes time and many laws from the past are still on the statute books[99]. At the same time, however, they are not burdened by the technological legacies of the west. They are adopting the most advanced technologies and in some industries, such as mobile banking, they are overtaking developed countries. This is promoting innovation among small companies. Too small to be influenced by the government, these companies use more advanced technologies than their peers in the west and suffer none of the limitations faced by large corporations. They have arisen in a globalised environment and from the outset, they have looked for a global approach. However, they suffer from limitations when it comes to sourcing financing. Venture capital markets are underdeveloped and the limited resources of small companies restrict their opportunities. What happens with the business opportunities these companies cannot handle? They are taken up by those old stalwarts of more developed markets, the conglomerates.

Whereas the west is tending towards specialisation, in the emerging world, conglomerates of firms such as the Tata Group are flourishing. These countries are a source of so many opportunities that companies do not stop to think whether the investments they have to make are in line with their business. They identify an opportunity and take advantage of it. The conglomerates use the money generated by more established businesses to finance promising projects with higher rates of risk. Because there is no developed venture capital sector, the companies themselves do the job. But the conglomerates have other functions. Because of their size, they can offer employees great prospects for professional advancement, and therefore tend to attract top talent. They also make it possible to build up a brand at national level, a difficult feat in such fragmented markets. People who enjoy Tata group tea when they are young may be more inclined to buy a Tata domestic appliance or work for the Tata consultancy services when they grow up. Many of these conglomerates are controlled by the government. They are vehicles through which the government can control economic activity. They are in a competitively advantageous position, since they obtain money from the government at subsidised interest rates and invest on the global market. Such companies are commonplace in China, Latin America and the Middle East.

Many western investors consider diversified conglomerates to be an outmoded type of management. Why should companies diversify when a private investor can do it on their own account on the market? With an efficient market and a well-developed venture capital sector, this is a strong argument. But developing markets are not efficient and venture capital is not well developed. The west has to take note: in developing markets, conglomerates are here to stay.

The new innovation centres

American car companies ignored their Japanese rivals for many years. They won't make the same mistake again with the new developing countries. While the American government fights the Chinese over the Renminbi exchange rate,

[98] "The fading lustre of the clusters", *The Economist*.

[99] http://online.wsj.com/article/SB123451653488482115.html.

American companies are turning to China and India without a second thought. They don't want to miss out on the chance to get into these markets.

Together with economic growth, the populations of developing markets are becoming wealthier and more urban. According to the McKinsey Global Institute, 41% of the Chinese population and 29% of the Indian population live in urban areas, and it is estimated that this population will grow by over 600 million by 2025[100]. McKinsey also expects middle class homes to grow fourfold in China and sevenfold in India. This potential market is a source of opportunity in several industries, but capturing them will not be easy. The growing urban middle class will require public services, infrastructures and consumer products in large quantities. But these consumers come from a host of ethnic groups and cultures; they have no loyalty to global brands and their preferences will change even more quickly than western consumers. However, they demand products of the same quality despite having only 15% of the purchasing power of their counterparts in developed countries[101].

With demographic stagnation in the west, companies from developed countries will have to turn to this new emerging population. Meeting their needs will not be easy, and innovation will therefore be essential. However, this innovation will not only have repercussions on this market, but also around the world. For example, General Electric (GE), the American technology and services multinational, has designed an electrocardiogram (a device that measures electrical activity in the heart) for the Indian market. The device sells for a fifth of the cost of conventional European ECGs and offers the same functions[102]. This new apparatus has improved healthcare for millions of Indians, but GE can also target it at developed markets. With the cost of the American healthcare system rising, innovations in this area could be very well received. Examples of this sort show that the creative energy of the world is shifting. Developing countries are becoming innovators in their own right, rather than just talented imitators. They will be the origin of a growing number of the world's innovations and large companies know it. *Fortune 500* companies now have 98 R&D centres in China and 63 in India, and much of the intellectual capital of the large consultancy firms comes from developing countries[103].

Technological innovation will be essential. Resolving the problems of scale of developing countries requires technology. Mobile phones have already changed the life of millions of citizens in these areas. Mobile terminals have given them access to telecommunications for the first time, instead of becoming mere extensions of existing fixed phone lines. Mobiles are not being used merely for communication, but as methods of transaction and payment[104]. As emerging economies grow, new technologies will be needed for sustainable development. Developing markets will define the future of electronics, computer science and clean energy. Suntech Power, the largest manufacturer of silicon photovoltaic panels, has its head offices in China. Huawei, the third largest manufacturer of telecommunications equipment, is the world leader in filing patents and is a supplier of nearly all the large telecommunications operators. Indians predominate among new technology workers and China is on the way to overtaking the US as the country with the largest R&D workforce[105]. Even Silicon Valley has a closer relationship with Bangalore and Taiwan than with Los Angeles.

Entrepreneurship is thriving in developing countries[106]. In 2009, 71% of Chinese preferred to work for themselves — as opposed to 45% of Europeans and 55% of Americans. When it comes to setting up a business, 39% of Chinese were taking the necessary steps or had experience in setting one up, as compared to 36% in the US and 21% in the Euro-zone[107] (see Illustration 20.). But developing countries

[100] "Comparing urbanization in China and India", *McKinsey Quarterly,* July 2010.

[101] "The great rebalancing", *McKinsey Quarterly,* June, 2010.

[102] "The great rebalancing", *McKinsey Quarterly,* June, 2010.

[103] "The world turned upside down. A special report on innovation in emerging countries", *The Economist,* April, 2010.

[104] "Mobile marvels. A special report on telecoms in emerging markets", *The Economist,* September, 2010.

[105] "The great rebalancing", *McKinsey Quarterly,* June, 2010.

[106] Global innovation index 2009-10. INSEAD & Confederation of Indian Industry.

[107] 2009 Eurobarometer Survey on Entrepreneurship. http://ec.europa.eu/enterprise/policies/sme/facts-figures-analysis/eurobarometer/fl283_en.pdf.

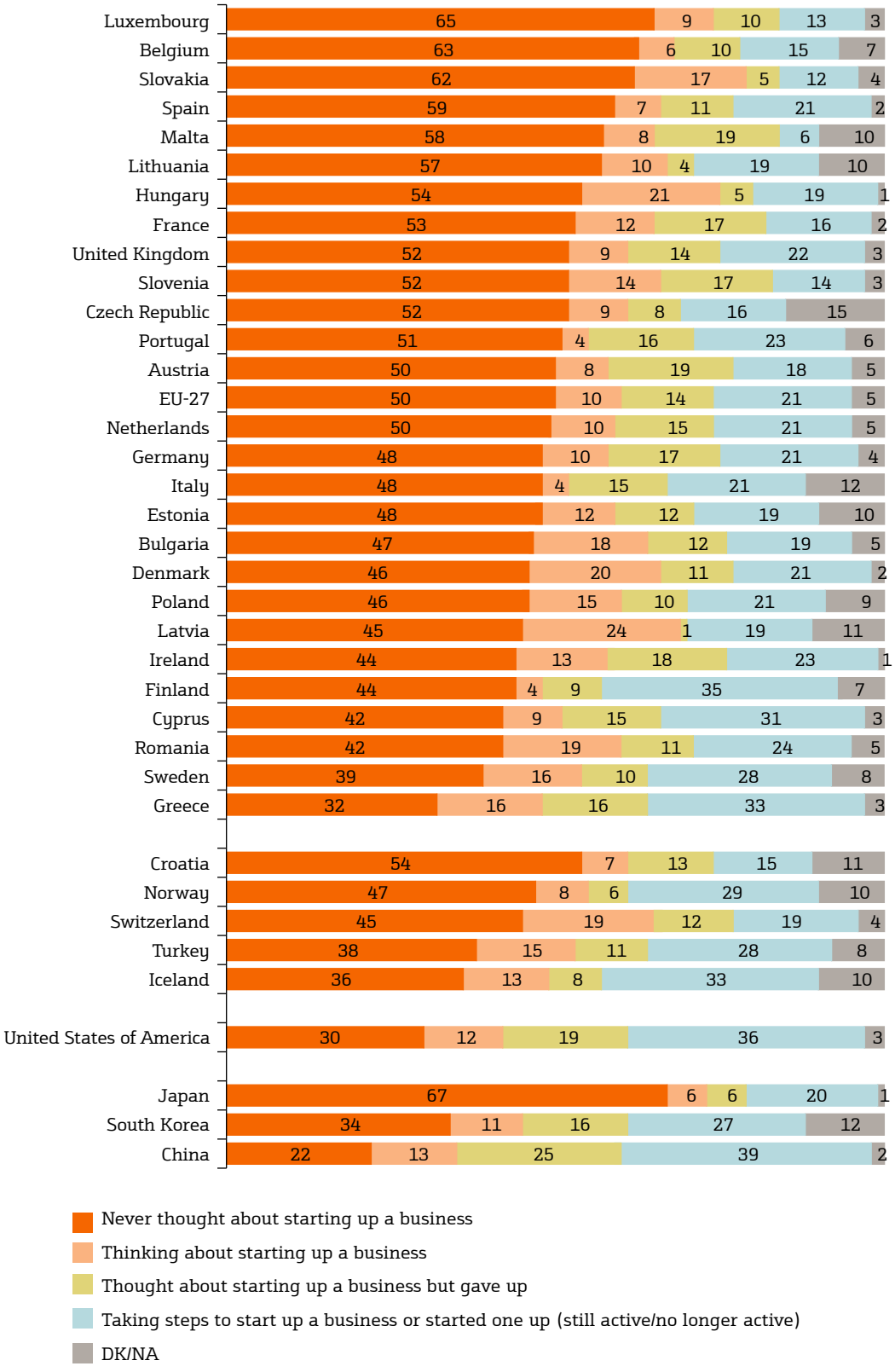


Illustration 20: Experience of starting up a business: the current situation.
Source: 2009 Eurobarometer Survey on Entrepreneurship.

are not only more enterprising; they are also more optimistic. 94% of Indians, 87% of Brazilians and 85% of Chinese said they were satisfied with their lives in 2009[108]. This blend of entrepreneurial spirit and optimism is a good nutrient for the innovation crop. The times are changing.

4.2. Innovate or die: innovation in developed countries

Developed countries had a head start in the innovation race. For years, America, Europe and Japan have been well out in front of the pack. But the lack of competitors at the back of the field caused some European and Japanese runners to relax. The Americans kept going strong, but their pace also slackened with no direct challenger to their title.

This situation now has changed. Developing countries have invested in infrastructures, education and R&D... they have trained. Their runners are more qualified and have set a faster pace than those out front. By 2005, Asia had already overtaken Europe in the innovation race[1]. The US and Japan are still the leaders, but China and India are close behind and catching up. The gap has been further narrowed as a result of the setbacks suffered by developed countries in the financial crisis. Developing countries have known how to avoid the pitfalls and have gained ground. The front runners can now feel them hot on their heels. In order to maintain their leadership, developed countries are going to have to put on an extra spurt. An increase in the pace of the race is good news for society and the world economy.

The west continues to innovate

Asia, and particularly China and India, always grab the headlines in any discussion on innovation. And though it is true that the coordinates of innovation are changing, America is still the hub. For the first time since it began, in 2005 BusinessWeek's 2010 annual list of 50 most innovative companies, the majority of companies in the top 25 were not American. However, America continues to account for twelve of the twenty-five most innovating companies and twenty-two of the top fifty (see Illustration 21). An entrepreneurial and innovating culture is very deep-rooted in American history. The country was founded by enterprising men and women prepared to sacrifice old certainties for new opportunities, and schoolchildren grow up listening to stories of great innovators like Thomas Edison and Benjamin Franklin. Added to the unusual ease of hiring and firing staff in business, it is hardly surprising that Americans consider that they are in charge of their own individual destinies. They are unfazed by the inherent risk of entrepreneurship. In the US the rewards are great and the punishments small. Unlike countries like Japan, where bankrupting company is a reason for social shame, in the US and particularly in Silicon Valley, it can even be an honorary title.

But the entrepreneurial success of America lies not only in its entrepreneurs, but also its consumers. Amar Bhidé, professor at the Fletcher school of Law and Diplomacy at Tufts University, defines them as "entrepreneurial consumers". They are not afraid to try out new products and services, even if it means reaching into their pockets and acquiring new skills[110]. But this is a feature that is not limited to the end consumer. American companies are much more receptive than their European counterparts to listening to ideas from young entrepreneurs and start-ups. This characteristic gives wings and the potential to fly to entrepreneurs who arrive with innovative products and services.

[108] "The world turned upside down. A special report on innovation in emerging countries", *The Economist*, April 17th 2010.

[109] *The new geography of global innovation*, Global Markets Institute, Goldman Sachs, 20 September 2010.

[110] Amar Bhidé, *The venturesome economy: how innovation sustains prosperity in a more connected world*, Princeton University Press, 2008.

1	Apple	U.S.
2	Google	U.S.
3	Microsoft	U.S.
4	IBM	U.S.
5	Toyota Motor	Japan
6	Amazon.com	U.S.
7	LG Electronics	South Korea
8	BYD	China
9	General Electric	U.S.
10	Sony	Japan
11	Samsung Electronics	South Korea
12	Intel	U.S.
13	Ford Motor	U.S.
14	Research In Motion	Canada
15	Volkswagen	Germany
16	Hewlett-Packard	U.S.
17	Tata Group	India
18	BMW	Germany
19	Coca-Cola	U.S.
20	Nintendo	Japan
21	Wal-Mart Stores	U.S.
22	Hyundai Motor	South Korea
23	Nokia	Finland
24	Virgin Group	Britain
25	Procter & Gamble	U.S.
26	Honda Motor	Japan
27	Fast Retailing	Japan
28	Haier Electronics	China
29	McDonald's	U.S.
30	Lenovo	China
31	Cisco Systems	U.S.
32	Walt Disney	U.S.
33	Reliance Industries	India
34	Siemens	Germany
35	Dell	U.S.
36	Nestlé	Switzerland
37	British Sky Broadcasting	Britain
38	Vodafone	Britain
39	JP Morgan Chase	U.S.
40	Oracle	U.S.
41	Petrobras	Brazil
42	Banco Santander	Spain
43	Fiat	Italy
44	China Mobile	China
45	Goldman Sachs	U.S.
46	Nike	U.S.
47	HTC	Taiwan
48	Facebook	U.S.
49	HSBC	Britain
50	Verizon Communications	U.S.

Illustration 21: Ranking of 50 most innovating companies in 2010.
Source: *Bloomberg Businessweek*.

Since its foundation, America has been a country of immigrants. Entrepreneurs from all over Europe descended on the continent in search of opportunities. Perhaps this is the source of another of the characteristics that have defined American innovation: a policy of open immigration. To a great extent, the country's success has been based on its capacity to attract the best talent. The brightest minds of China, India, Russia, Brazil and elsewhere have all gone to the US. Fifty-two percent of Silicon Valley start-ups were founded partly or totally by immigrants[111].

Immigration has also left its mark on the formation of other innovation centres in the developed world. 400,000 highly skilled Jewish refugees emigrated to Israel from the Soviet Union. Now Israel has the largest percentage of PhDs per capita in the world, as well as the highest ratio of engineers and scientists and some of the best research universities in the world[112]. But Israel's geographical location has also impacted its innovating culture. Because it is an island in an ocean of Arab hostility, the army has always been kept at the forefront of technological innovation, with troops being trained in the latest technology. And it is also a training ground for young Israelis, who are schooled in improvisation and

[111] *America's New Immigrant Entrepreneurs*. Vivek Wadhwa. Duke Science, Technology & Innovation Paper No. 23, January 2007. http://papers.ssrn.com/sol3/papers.cfm?abstract_id=990152.

[112] "Lands of Opportunity. A special report on entrepreneurship", *The Economist*, March 2009.

The financial crisis and the subsequent emphasis by governments on innovation have highlighted many of the barriers entrepreneurs face

teamwork. Out of these experiences in the army comradeships are forged that can lead to the creation of new businesses. In a culture that is accustomed to the hostility of neighbours, the risks of launching a new company are perfectly acceptable.

A sustainable economy requires trained people. Ireland became the beachhead for an influx of American hi-tech companies onto the European market. The country was known for its cheap labour, low taxes and for having English as the official language. These characteristics made the country the perfect European hub for American tech firms. However, the strategy was not sustainable in the long term; as the population got richer, it lost its cost-based competitiveness and companies left just as quickly as they came. The decision by Dell, the American computer manufacturer, to transfer its Irish production plant to Poland is a clear example[113].

The government of Singapore is keenly aware that an innovating economy needs to attract and retain talent. It therefore tries not only to make life easier for companies and entrepreneurs (it comes first in the World Bank's ranking of ease of doing business[114]), but also to try to make Singapore an attractive place to live. And so it offers very attractive wages to skilled scientists and immigrants, and as Tan Chin Nam, Chairman of Singapore's Media Development Authority and FTF trustee and expert, explains, the country is striving to be a benchmark in culture and entertainment. But the Government is also trying to promote innovation amongst a population traditionally unwilling to take risks. To this end it has invested heavily in environmental and water purification technologies, bio-engineering and digital and interactive media. It is promoting education for entrepreneurship at university, has created large incubators and has set up a state-owned venture capital firm which has in turn attracted a great deal of private venture capital. At present, more than 5% of companies with head offices in Singapore are backed by venture capital[115].

Throughout Europe there are also plenty of examples of large innovation centres. London is one of the axes of financial innovation. The city has been deeply affected by the financial crisis, but the dynamism that flows down its streets will help it recover. Germany is a benchmark for automobile innovation. Two of its companies, BMW and Volkswagen are listed among *BusinessWeek*'s twenty most innovating companies and Mercedes and Audi, two references for top-of-the-market vehicles also have their head offices in Germany. Italy is the great design centre. Large Italian fashion brands such as Gucci and Giorgio Armani are known around the world, though Italian design is not limited to fashion: the motorbike manufacturer Ducati is known by its excellent designs and Ferrari makes the world's most prestigious sports cars.

Obstacles along the way

As we can see, developed countries continue to be a source of innovation, but all that glitters is not gold. The financial crisis has poured cold water on western companies. Accustomed to high growth rates, they have focused on the short-term, neglecting their long-term competitive position. The recession that has accompanied the financial crisis has forced companies to cut back their structures and become more efficient. Before the crisis, wastage was hidden by high growth rates and burgeoning profits. The collapse of the markets has sent many companies under and those that have survived have cut back costs to an important degree. Now they have to innovate and many do not have the assets needed to do so.

[113] http://business.timesonline.co.uk/tol/business/industry_sectors/technology/article5472924.ece.

[114] *Doing Business 2010*, World Bank.

[115] "Lands of Opportunity. A special report on entrepreneurship". *The Economist*, March 2009.

Something similar has happened in the public administration. As the economy grew, government excesses went unnoticed. Now that recession has hit, investors have begun to give a heads-up to several governments including those of Greece, Spain and Portugal[116]. These governments are also being forced to improve efficiency. In addition, when it came to reviving their economies, developed countries had an unpleasant surprise; they discovered that their policies did not encourage innovation. The governments of developing and emerging countries have always been accused of being overly interventionist but when it comes to innovation, western governments can do just as much harm.

The American entrepreneurship ecosystem suffers from a complex legal system, with legions of lawyers prepared to file collective suits against companies for the most diverse causes. Companies also have to spend important resources on tackling an overly complex tax system. Immigration legislation is another barrier — surprising in a country characterised by immigration like the USA. Immigration policies were made more restrictive after the 9-11 attacks in 2001 and more than a million of people are still awaiting permanent residence permits[117]. The American healthcare system is also a limiting factor. Costs have soared, placing a burden on the entire economy. Those most affected are small companies that do not have the necessary weight to negotiate with the insurance companies.

Japan suffers other problems. The brightest minds want to work for large companies or the government. Venture capital is scarce and bankruptcy is severely punished. Europe, too, has its share of barriers. A welfare system with generous unemployment benefits, higher corporate tax rates and more negative attitudes to bankruptcy give Europeans fewer incentives to take on the risks of launching a new business. In addition, the European market continues to be much more fragmented than the American one. Employers have to struggle with a host of different legal codes and in many countries the taxation system and labour laws actually penalise companies that grow beyond a certain size. Large European universities continue to depend on state subsidies and are not prepared to enter close relations with the private sector[118].

The financial crisis and the subsequent emphasis by governments on innovation have highlighted many of the barriers facing entrepreneurs. As a result, governments of developed countries appear to be reacting and a chink of light is now beginning to be seen. Examples of this reaction include the new British government, which is prepared to reform the social welfare system and the importance of the state[119], the US President, who has pushed through a law reforming the American healthcare system[120], and a number of European countries which have launched national innovation initiatives.

The coordinates of innovation are changing and developing countries will play an increasingly large role. However, in the innovation race, the west is beginning to wake up again. Names such as Silicon Valley, Cambridge-Massachusetts, New York and London will continue to lead the field. Other runners, such as Shanghai, Bangalore and Sao Paulo will force the leaders to speed up, but this is good for the world economy. With a bit of luck, a few world records will be broken at the next Innovation Olympics.

[116] http://www.nytimes.com/2010/04/29/business/global/29euro.html?_r=1.

[117] "The United States of Entrepreneurs. America still leads the world. A special report on entrepreneurship", *The Economist*, March, 2009.

[118] "The United States of Entrepreneurs. America still leads the world. A special report on entrepreneurship", *The Economist*, March, 2009.

[119] http://www.eleconomista.es/economia/noticias/2495644/10/10/Vivir-a-expensas-del-Estado-ya-no-es-una-opcion-posible-ha-terminado.html.

[120] http://news.bbc.co.uk/2/hi/8579322.stm.

4.3. In search of the perfect recipe

There is clear consensus among the FTF experts: there's no such thing as a magic recipe for innovation. Does it make any sense to apply Israel's innovation policies in a country like Spain? Clearly not. The two countries start from quite different points, and a policy that has worked in one is very likely to fail in the other. It is even probable that it would not work for the same country at another time. As we have already seen, cases of success do not serve as models, but are a source of inspiration. Keeping the army at the forefront of technology and maintaining two years compulsory military service are factors that have made Israel into an innovation cluster, but they might not be feasible in a country such as Spain. However, the Israeli army's training in improvisation and teamwork can be applied in the Spanish education system.

Encouraging innovation requires a global approach. There are many factors that will determine a region's innovating future. Understanding policies that have worked elsewhere may help write the recipe for a region. Even examples that have not been as successful can help identify well-meaning but mistaken initiatives. Recipes for innovation are like the recipes at El Bulli, Spain's most famous restaurant and until recently rated as the best in the world. For El Bulli, a recipe that has already been invented cannot be included on the menu. Everything has to be new. The same is true of innovation strategies. Copying someone else's policies is not an option; a region's innovation policies must be new.

Society is facing strong pressures for change. Some of the most important include[121]:

- Globalisation: developments in transport and communications have turned the world into a network in which companies seek the most favourable conditions for their operations. The products can be created in one part of the world and distributed in another. Distance is no longer a limiting factor when selecting markets.

- Sustainable development: climate change is a hot topic. The current rate at which we are consuming resources is not sustainable. Future innovations will have to seek efficiency in consumption and use of resources.

- New technologies: the unstoppable advance of technology is producing new products and services. Competive advantages are ever more fleeting and companies need to work to stay ahead. Not being up to speed with the latest technological development can leave a company out in the cold.

- Demographic changes: the population of developed countries is ageing, whereas in developing countries it continues to be young and growing. Each region will have to deal with its population structure and immigration will be an increasingly important factor.

An innovating policy must recognise and consider these pressures. It is a necessary (though not sufficient) condition for success.

[121] http://ec.europa.eu/invest-in-research/pdf/download_en/finland_national_innovation_strategy.pdf.

The entrepreneurial ecosystem

Why do innovation programmes fail? Innovation in a region is a long-term investment. The effects of reforms such as educational reforms are not seen until many years later. Politics, however, lacks the necessary long-sightedness, tending to focus on four or five-year periods. Governments want initiatives that will bring returns during their term of office, an approach that does not sit well with innovation needs. The targets set by governments in this area tend to shoot in all directions, with no overall approach, and are often ambiguous. Many adopt the wrong approach when establishing strategies. They pursue an unachievable ideal and look for best practice in regions very different to their own. Most suffer from *Siliconitis*[122]. They try to repeat the success of Silicon Valley. There have been many attempts to reproduce the model: Silicon Hills (Texas), Silicon Prairie (Kansas), Silicon Forest (Oregon), Silicon Glen (Scotland), Silicon Dominion (Virginia) and Silicon Fen (Cambridge, UK) are just a few examples[123]. The results vary, with Israel standing out as the most successful case, but most have been embarrassing failures.

Tackling innovation by firing random broadsides is a guaranteed failure. Innovation in a region requires a global approach. Education, immigration, fiscal policy, the labour environment... all areas of the administration are involved. If a strategy is to have any chance of success, it needs to be consistent, and that means that the targets of all areas must to be aligned with regard to innovation. Some overall figure is required, an innovation leader who will run policies in this field in all areas. This position must be stable, not changing from one government to the next, and agreement between the dominant political forces is therefore essential. Leadership and political will are one of the hypotheses with which the experts work. It is a hypothesis that is difficult to assume, but the experts cannot help if there is no political will.

According to Daniel Isenberg, management professor at Babson College, founder of the Babson Entrepreneurship Ecosystem project and FTF expert, an entrepreneurial ecosystem comprises thirteen factors: leadership, government, culture, success stories, human capital, financial capital, entrepreneurial organisations, education, infrastructure, clusters, networks of people, support services and customers (see Illustration 22 for greater detail). All these factors affect entrepreneurship and thus innovation. An entrepreneurial ecosystem is a complex system and it is impossible to tell the impact of each factor on the innovation of a region. Chance is also a factor. When the Indian Technology Institute was set up, it was designed more to train technocrats than entrepreneurs. It was a matter of luck, rather than good planning, that the university created the profiles needed by a budding software industry[124].

All the factors Daniel Isenberg identifies are important for entrepreneurship and innovation in a region. The strategy must encompass them all. But if one of the factors stands out above all others, it is culture. There is no use preparing the road for innovation if your citizens all want to be civil servants. It is always difficult to change the culture of a country, but this should not prevent action being taken. Countries such as Chile and Ireland have turned their culture round in less than a generation and Margaret Thatcher's government woke Britain out of its lethargy in the 1980s.

[122] http://www.economist.com/node/13216077.

[123] *The emergence of entrepreneurship policy: governance, start-ups, and growth in the U.S. knowledge economy.* David M. Hart. Cambridge University Press. 2003.

[124] "Magic formula, A special report on entrepreneurship", *The Economist*, March 2009. http://www.economist.com/node/13216077.

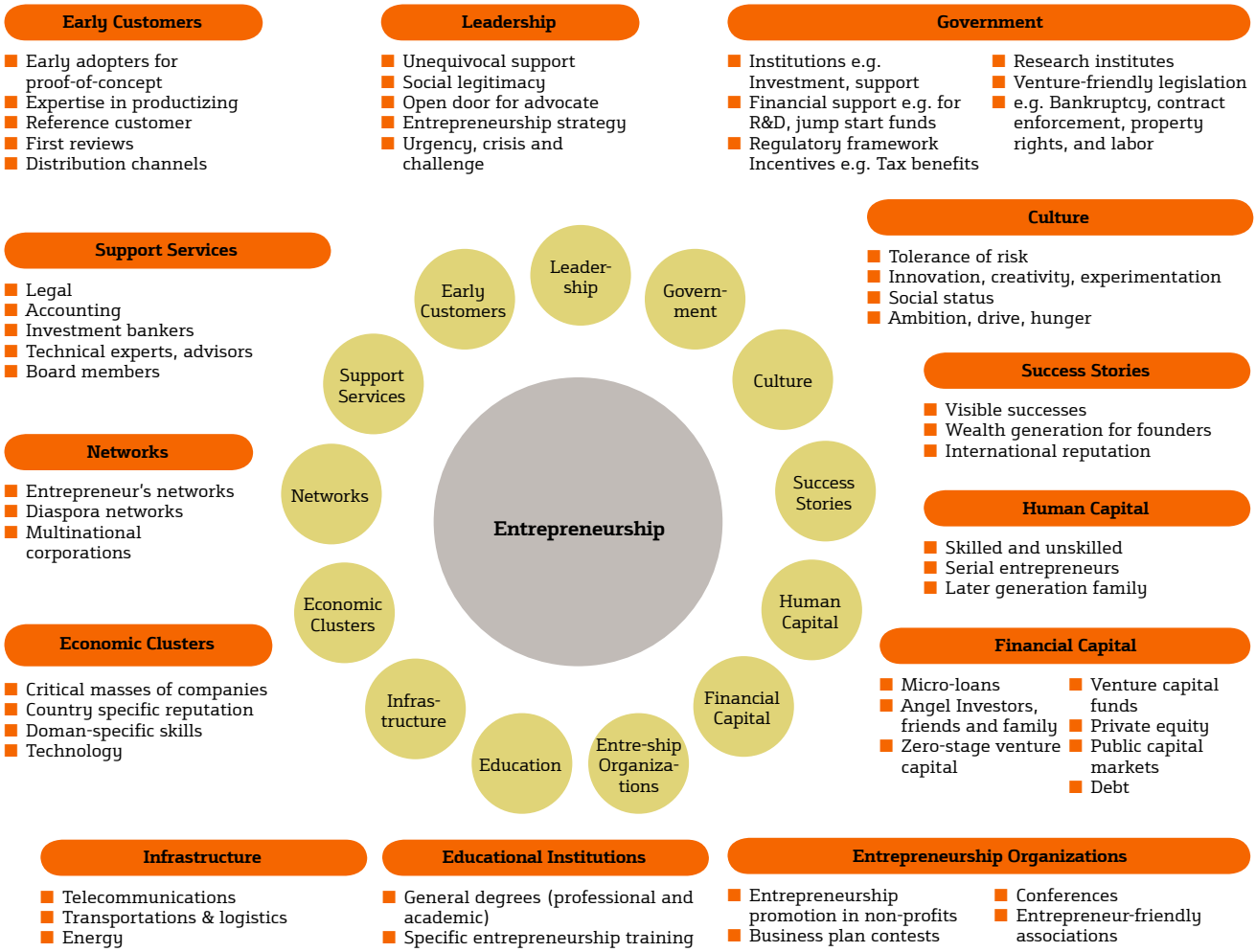
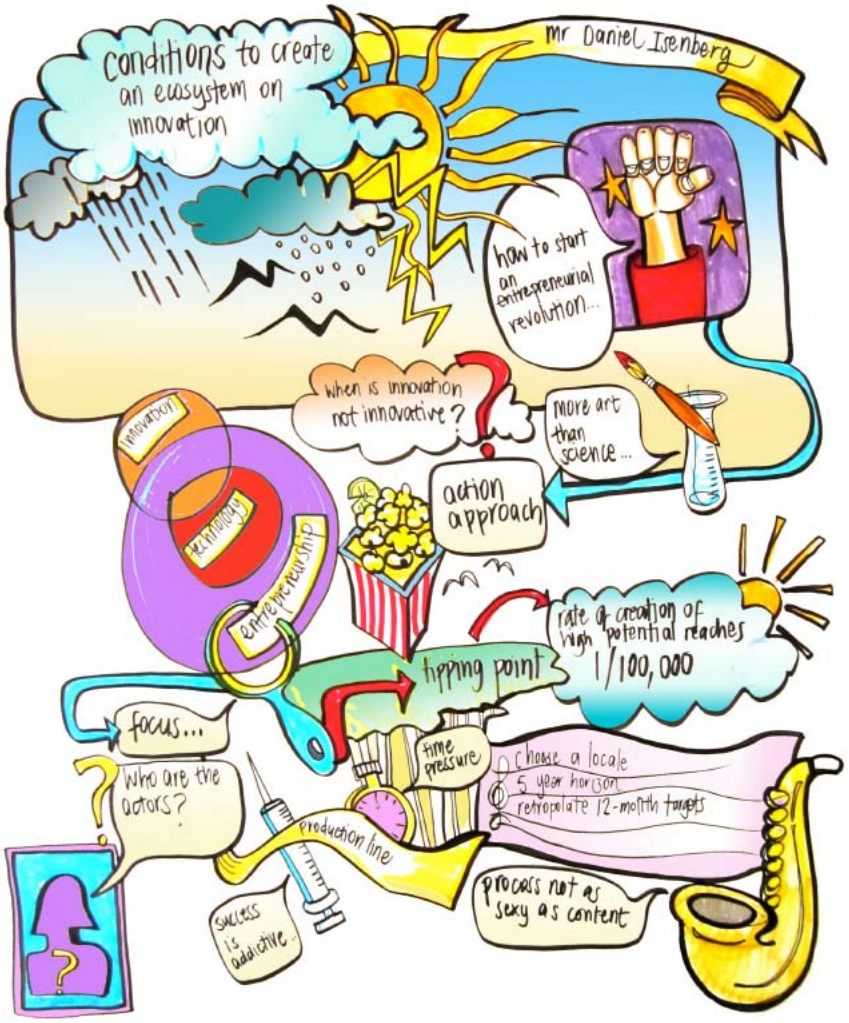


Illustration 22: The entrepreneurial ecosystem.
Sources: Presentation by Daniel Isenberg at the Future Trends Forum.

Any successful strategy must ensure that all actors are singing from the same hymn sheet. In this challenge, the process of implementing the strategy is just as important as the content. The innovation programme must keep its participants involved and motivated — and to do this, it needs results. By results, we do not mean the ultimate goal of the programme, but small advances throughout the process. The plan for the innovation programme must set progressive targets, small milestones. Daniel Isenberg recommends setting targets at least once a year. What can these interim targets offer? Firstly, they mark a control point in the development of the programme. As with any project, they make it possible to identify deviations and take the necessary action. And secondly, they allow all those involved to see how their work is progressing and, provided the results are positive, they reinforce their commitment. An innovation programme is not a PowerPoint presentation. It is a continuous process. At the pace at which society is changing, any long-term planning is a difficult task. This is why an innovation programme must be reviewed and updated to see these changes.

Unfortunately, following all these recommendations still won't guarantee success. These policies cannot provide a more innovating region. Chance will also play its part. In any case, these policies will be positive for a region and, without them, innovation will not be able to take place. Daniel Isenberg cannot be sure that these recommendations will work, but there is a strong chance that they will. Nonetheless, one thing is clear: "doing nothing is absolutely unacceptable".



Source: Illustrations resuming Future Trends Forum's presentations.

5 Innovation in Spain

- The outlook for innovation in Spain
- Plans and approaches for an innovating future

Innovation is not the first thing that springs to mind when one thinks of the Spanish economy. Spain is not commonly associated with innovation, but this image has to change. Innovation is already playing an increasingly important role in the country. For two consecutive years, Banco Santander has come in 42nd place of *BusinessWeek*'s list of the world's most innovating companies; Zara is a role model for fashion chains around the globe and Iberdrola is a reference point for energy utilities in the field of renewable energy. However, it is not the exclusive territory of the large corporations; small firms also innovate. The Cocktail, a Spanish company specialising in comprehensive management of companies' on-line presence, is an outstanding example of innovation, despite having a staff of just 70. It works in the area of on-line innovation for leading companies on Spain's Ibex35 stock index and in 2010 it won a Webby[125] prize in the travel category, thanks to a project developed at the initiative of its own employees[126]. The Cocktail promotes and invests resources in the most interesting ideas from its staff. A glance at its web site gives some idea of the firm's innovating potential[127]. And it is not an isolated example; other SMEs are innovating in Spain, although admittedly fewer than in some of the world's top innovating regions. The Spanish market is not free from obstacles and innovating SMEs like The Cocktail have had to face up to these adversities to become what they are today. Imagine just how many innovating Spanish firms fall by the wayside. Small examples like The Cocktail show that there is a potential in Spain that we must learn to tap into.

Unfortunately, the Spanish economy is going through a deep crisis that may slow down its innovating potential. According to European Monetary Fund estimates, the crisis will leave its mark on Spain. Not only will it fail to rise up the world economic ranking, but over the next five years it will slip three places from being the world's ninth largest economic power in terms of GDP in 2008 to the twelfth in 2014[128]. There is a clear danger the country could become stuck half-way between the highly innovating economies and the low cost manufacturers. Improving the competitiveness of the Spanish economy has become an imperative for returning to growth. The effort invested in factors that affect productivity (human capital, physical capital, innovation, ICT, technology, etc.) has grown over the last decade. However, Spain is still in a relatively unfavourable position compared to more advanced countries, especially when it comes to technological RDI processes[129].

Pedro Luis Uriarte, chairman of Innobasque, asks this question: "How can the world's seventh largest economic power, with no natural resources or energy resources of its own and with a poor demographic outlook, high wage costs and low productivity, compete in the future?". The answer is to tackle the factors that affect productivity and competitiveness. It is necessary to generate many ideas and know how to turn them into added value. In short, this is innovating. This is a medium-term commitment which, in combination with the specific measures taken to get the country out of the crisis, will allow Spain to find its place in the new wave of medium-term growth[130]. However, the prospects are not good. In its report for 2010, COTEC, a foundation intended to contribute to development by encouraging technological innovation in Spanish business and society, echoes the experts' deep concern[131]. Respondents to the survey predicted a deterioration in the development of the Spanish innovation system.

The growing interest in innovation in Spain is reflected in a plethora of surveys on the subject. Of these, one of the most rigorous is COTEC's annual technology and

[125] International prizes for excellence on the Internet, organised by the International Academy of Digital Arts and Sciences (http://www.webbyawards.com/).

[126] http://the-cocktail.com/es/blog/iwannagothere-com-web-espanola-de-viajes-ganadora-en-los-webby-awards-146.

[127] http://the-cocktail.com/es/ideas.

[128] http://www.abc.es/20100412/economia-economia/espana-pasara-novena-potencia-20100412.html.

[129] http://www.fundacionbankinter.org/system/documents/5984/original/FTFXI_La_innovación_elemento_clave_en_el_futuro_ES.pdf.

[130] http://www.fundacionbankinter.org/system/documents/5984/original/FTFXI_La_innovación_elemento_clave_en_el_futuro_ES.pdf.

[131] *Tecnología e Innovación en España*, Informe COTEC 2010.

innovation report, cited above. Accenture, in collaboration with the Autonomous University of Madrid and the Spanish Association of Information and Communications Technology (AETIC), has also undertaken a very useful and revealing study of the Spanish situation, entitled *The Role of Innovation in the New Spanish Economic Model* [132]. These two studies identify the main problems Spain faces in innovation and offers a series of recommendations. The conclusions below are taken from information in these studies.

The current situation

In previous sections, we have seen that spending on R&D is not an exact indicator of innovation. It is a controversial indicator and its effect on innovation is highly influenced by many other variables. In practice, however, there is a positive correlation between R&D spending and the volume of innovation in a country. This measure therefore continues to be considered relevant in all studies on innovation. Spain has seen improvement in the main R&D indicators (see Illustration 23); it has cut the distance from EU and OECD averages, but the gap is still considerable. Spending on R&D per capita and as a portion of GDP is considerably lower.

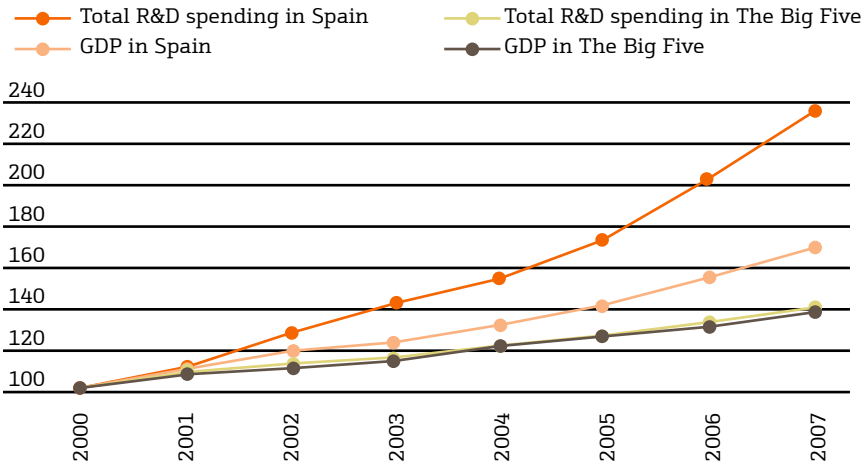


Illustration 23: Development compared to total R&D spending in Spain and The Big Five (Germany, France, Italy, UK and Poland), 2000-2007 (index 100 = 2000)
Source: COTEC Report 2010.

Distribution of R&D spending in Spain diverges from the pattern in developed economies, with less spending by private enterprise (see Illustration 24). In developed economies, the business sector accounts for nearly two thirds of all R&D expenditure, whereas in Spain it accounted for just 55.1% in 2008. From 2007 to 2008, the burden of private sector spending fell compared to the previous year, as spending by public authorities and in higher education increased. Although R&D spending by the private sector grew in the period 2000-2008, there is still a long way to go.

[132] http://www.accenture.com/Countries/Spain/Research_and_Insights/Government/El-papel-espanol.htm.

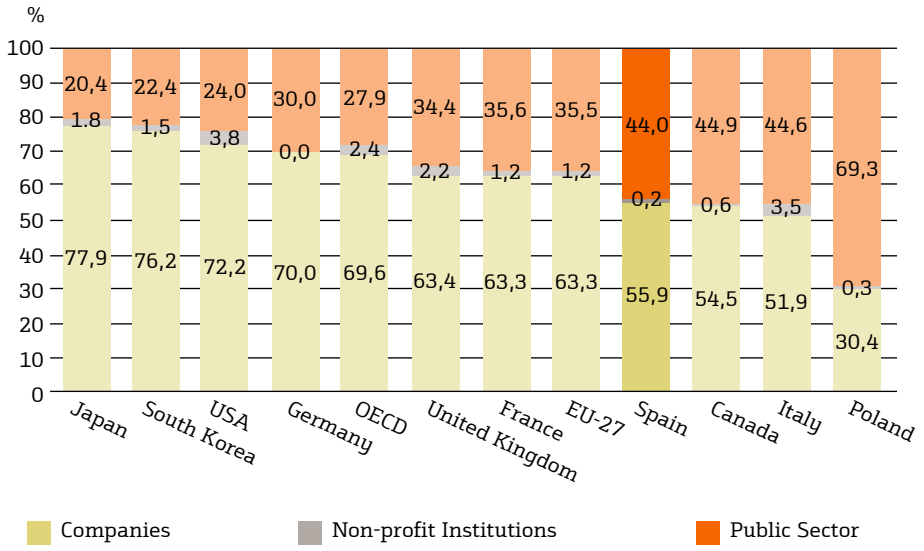


Illustration 24. Distribution of R&D spending by sector (2007).
Source: COTEC Report 2010.

As for scientific publications, Spain's share of total world production rose from 2.26% in 2000 to 2.75% in 2008. But, like R&D spending, the business sector makes a very small contribution to this figure (2.26% of the total in 2003-2008).

Education, another relevant indicator in the field of innovation, also shows worse results than the EU and OECD averages, despite the fact that per-student spending on education (public and private) is comparable. (In Spain there is a polarisation which is unusual amongst OECD Countries: the rate of students completing secondary education is lower than the European Union average, whereas the percentage of students going on to university is similar. The drop-out rate, i.e. the percentage of students who leave the education system before completing secondary education grew by 2.8% between 2000 and 2008. However, the number of university students has continued to grow in the same period of time, even though they are coming to university with a worse education. These circumstances reduce the pool of secondary school graduates. The knowledge and skills of this group are highly important for companies' productivity, rapid incorporation of innovation and in providing backing for R&D work.

The low level of educational is reflected in the education of company management. In 2009, 36% of management staff had a low educational level, as compared with an EU average of 17%. This may be one of the principal reasons why so many policies intended to favour innovation fail. Spain has the highest rate of fiscal support for RDI of any country in the OECD. Large companies are making the most of this support. SMEs, however, are not making use of the incentives. The reasons for this are unclear, but it seems likely that a lack of information, an overestimation of costs and an underestimation of profits, together with a lack of education among management are the primary causes.

R&D financing is another factor in which Spain is not on a par with other developed countries. The burden of public financing is higher than the OECD average and it has increased in recent years. More than three quarters of business

R&D in 2008 was financed with contributions from the companies themselves, although much of this amount came from government loans within the framework of R&D support schemes. Within the area of private equity, the Spanish venture capital sector has grown progressively over the last ten years, except in 2009 (see Illustration 25), although it continues to be small compared to the most innovative economies. In 2007 new regulations were published classing venture capital and private equity as "suitable assets" for investment by pension funds and insurance companies. However, the contribution made by these institutions to the funds has remained low and stable, not exceeding 1.5% between the two sources.

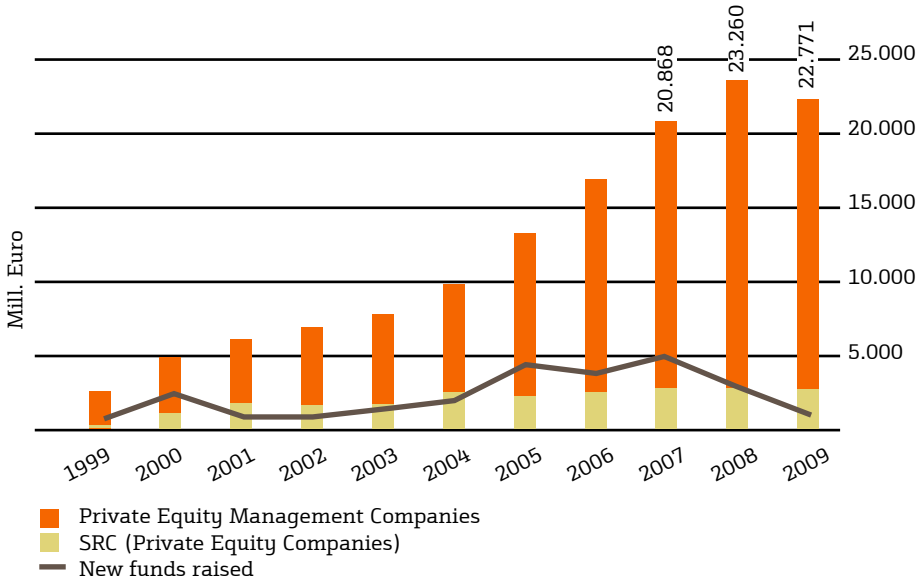


Illustration 25: New resources and total capital managed.
Source: ASCRI, 2010.

The "Alternative Stock Market" (Mercado Alternativo Bursátil - MAB), which targets undercapitalised companies, is another alternative source of funding for SMEs. The MAB was founded in 2005 to facilitate the creation and growth of companies with a strong technological risk. It is characterised by the greater flexibility of the entry requirements and financial information, as well as lower costs than traditional stock markets. This market has served as a vehicle for companies such as Zinkia, the animation producer famous for its children's cartoon character Pocoyo, in funding its expansion plans[133].

The Spanish market suffers from other shortfalls, such as a lack of investment in infrastructures. Despite the fact that investment in equipment came close to EU averages, 30% of the investment went to housing, instead of more suitable industries for encouraging innovation. This and other shortfalls, together with the impact of the crisis, have worsened the outlook for innovation. This situation is confirmed by the COTEC index, which measures trends in the Spanish innovation system.

[133] http://www.cincodias.com/articulo/empresas/productora-Pocoyo-sale-Bolsa-financiar-expansion/20090620cdscdiemp_6/cdsemp/.

What does the future hold?

For some time there has been talk of the need for a new economic model for Spain. The government sees innovation as one of its principal axes of growth and has prepared an ambitious agenda entitled the State Innovation Strategy (E^2I). Arturo Azcorra, CEO of the Centre for Technological Industrial Development and FTF expert, says that the aim of this the plan is to bring about a structural transformation in the Spanish economic and social base. As Illustration 26 shows, this strategy is based on five pillars: financing of innovating ideas; market orientation (focusing innovation on the market and strengthening the contracting of innovative products and services in procurement and purchases within the public administration); business internationalisation; encouragement of cooperation and territorial cohesion; and training, attraction and retention of human capital. The plan identifies various actions for each of these pillars, combining direct action with a change in policy.

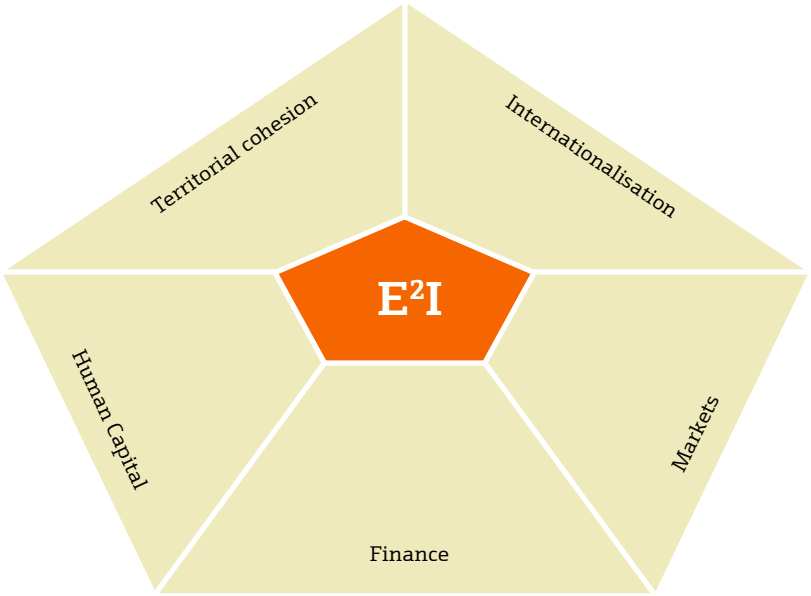
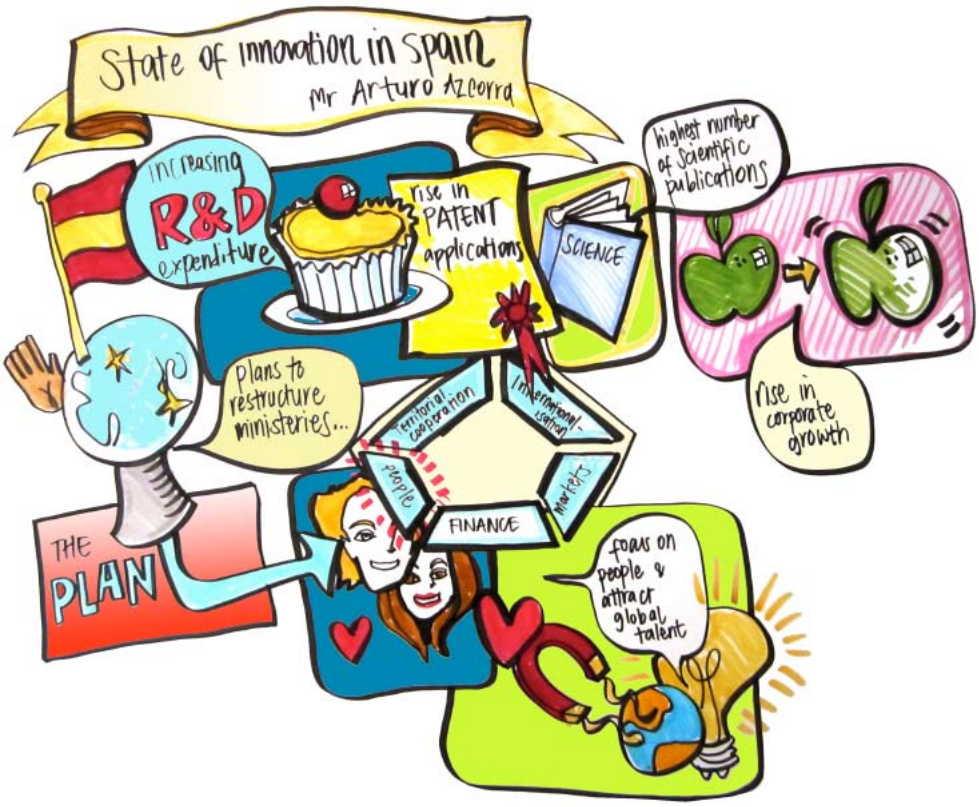


Illustration 26: Pillars of the State Innovation Strategy.
Source: presentation by Arturo Azcorra at the Future Trends Forum.

This government-designed plan will have to solve the issues raised by the experts, who consider that it is necessary to make better use of the investments and innovations already made by companies in the ICT industry. A new model is needed building on the existing knowledge, without neglecting efforts that may generate new knowledge. Great stress is placed on encouraging innovation in hi-tech companies, but studies show that there is also a great potential for innovation in traditional industries. Tourism, the textile industry, transport and logistics, energy, food, the financial services sector and arable farming all offer good prospects for developing innovations. Spain has demonstrated its competence and is well-known in these industries, but the companies are not as competitive as they could be. Many of these industries could feed off the knowledge generated in the areas of the latest technology.

The industries in the Spanish economy, above all the more traditional ones, will need to change their current support, based on labour that is no longer cheap, and replace it with advanced knowledge and technology



Source: Illustrations resuming Future Trends Forum's presentations.

The experts also consider that the innovation strategy should focus on small business. Large companies know what needs to be done and are investing in innovation. Most small companies are not. For this reason, they consider that it is necessary to apply a "water-torture" approach, i.e. continuously reminding this group of the need to create new things and to innovate. The tax incentives are the most favourable in the OECD, so it is not a question of improving the incentives, but of maintaining and publicising them more. In this aspect, institutional barriers are an obstacle and the government is far from having speedy technology-driven processes. Electronic government, already implemented by the Revenue Agency, needs to be rolled out further. This process will act as an example, forcing companies to use new technologies in their dealings with the authorities.

The same is true of knowledge. It is just as important to distribute knowledge as to create it. This requires a reform of the financial system, enabling these companies to grow and disseminate their new products and services. Financing for innovative companies in Spain is very complex and controversial. It does not reflect the value of the intangible assets and is awarded on the basis of tangible equity, thus to a large extent penalising innovative companies. However, greater distribution requires, above all, a major reform of the education and training systems. Relations between university and business need to be better structured. It is necessary to transform the structures that currently exist by professionalising some of the management positions, offering suitable recognition in researchers' résumés and opening the university up more to business. It is necessary to move from a system of relations based on knowledge transfer to the coproduction of knowledge.

The education system must also encourage a culture of effort and promote social and professional recognition of teachers, particularly secondary teachers, to stimulate quality and competition. The level of excellence in university education —to which the most qualified have access— must also be raised. Any change in the production model means that the industries in the Spanish economy, above all the more traditional ones, will need to change their current support, based on labour that is no longer cheap, and replace it with advanced knowledge and technology. The Spanish production model needs to be based on activities that are less intensive with unskilled labour and much more intensive in terms of skilled human capital. And the origin of that capital lies in the education system.

Another of the principal recommendations is to remove barriers to company creation and growth; the experts feel sure that this move would be a more powerful instrument for encouraging entrepreneurship than the creation of subsidies. A country that wants to compete with the world's leading economies cannot come 62nd in the World Bank's *Doing Business* list of ease of doing business. There are other more specific conditions that need to be met, such an increase in spending on R&D among companies and investment in infrastructures, but it is education reform and the removal of barriers recommended by the World Bank that will really determine Spain's future as an innovator. The government's strategy for encouraging innovation must take these factors into account if it is to address the root causes of the problems faced by the Spanish economy.

6 Conclusion

Innovation is the first item on the agenda for today's leaders. However, there is a danger that so much hype might weaken the message, and this publication seeks precisely to avoid that mistake. Is innovation the solution to all our problems? Not to all of them, but to many of them and especially the most important ones. We don't know exactly what innovation is, but the experts have shown us that you don't need to know to promote it. Like physics, you just have to know the fundamentals.

One of the conclusions of the study is that there is no perfect recipe. Each region has its own special features and what works in one won't necessarily work in another. However, that is no justification for doing nothing. Knowing the right levers to promote innovation and entrepreneurship, it is possible to design a recipe to suit local conditions in a region. Taking the right steps does not guarantee success, but, even if the region does not become the next great innovation cluster, the actions chosen will have an impact on the region's entrepreneurial and innovating spirit. Above all, they will be reflected in its economic situation.

There are many factors that determine a region's capacity for innovation and entrepreneurship. These can be grouped into the large pieces making up the jigsaw puzzle of innovation and entrepreneurship: government, business, education, people, networking and social responsibility. Governments are responsible for defining the policies and laws that will pave the way for business in the innovation process. Companies are the scenario of innovation. The education system is the place where the foundations of innovation are laid. People are the centre of innovation. It is from them that the ideas, motivations and ambitions that lead to innovation spring. Networks are the common links between different people's perspectives, and they drive innovation. And social responsibility allows for a type of innovation that the market tends to neglect: social innovation. These six large pieces allow us to prepare a general framework that will bring some consistency to an innovation agenda. Governments must design each piece thinking about the region as a whole, but they must always keep one essential element in mind: the sustainable innovation of a region does not depend on its policies and institutions — it depends on its companies and people. This is why it is necessary to encourage an innovating culture.

The coordinates of innovation and entrepreneurship are shifting. The financial crisis has especially affected developed economies. Accustomed to the high growth rates of recent years, the leading economies of the West have neglected their competitive position. In the meantime, developing countries, headed by China and India, have invested in innovation. Low wage costs have led to a process of delocalisation in which the developing countries have replicated western models. But it hasn't all been imitation. Developing countries have strengthened their intellectual capital and have learnt a lot in the process. They are now important sources of innovation and are taking giant steps forward in the race for innovation and entrepreneurship. However, the West is still the reference point. Innovation is still present, especially in the US which is still the most innovating country in the world, and through whose veins runs an entrepreneurial culture—sometimes despite its government. Without wishing to understate the important economic consequences, the financial crisis has served as a wake-up call for developed economies and they are beginning to react.

Finally, the principal studies of the Spanish innovation system by COTEC and Accenture (in collaboration with AETIC and the UAM) show that the Spanish economy is not well positioned to address the new society of the future. Spain has the potential for innovation, but the ecosystem does not encourage an entrepreneurial culture. The government knows the importance of innovation for the country's future competitiveness, but the problems lie at the roots. The country needs to strengthen its education system and make things easier for business. Many other policies may help encourage innovation, but if these two are not tackled head-on, the potential for improvement may be greatly reduced.

In short, the FTF experts see an innovating culture as the only source of sustainable competitive advantage. In an ever more connected and globalised world, knowledge spreads at dizzying speed and novelties soon become relics. Competing merely in terms of cost is not a sustainable strategy, it is necessary to compete in intellectual capital. Encouraging innovation is a long-term project; it requires a comprehensive approach and a shared commitment and goal. Regions that apply it best will be those that are best prepared for the economy of tomorrow.

Source: Illustrations resuming Future Trends Forum's presentations.

Appendix

- Glossary
- Members of the Future Trends Forum

Glossary

A

ARPU
Average Revenue Per User obtained by a services company in a given period of time. ARPU is calculated by dividing the company's total income by the total number of active customers. It can be applied to any services company, but is used particularly in the telecommunications industry, and especially in mobile telephony, since it helps assess the company's performance, taking into account not only its total number of users, but also the "quality" of these customers — i.e. whether they contribute earnings to the company and to what extent.

B

Bottom of the pyramid, The
The bottom of the economic pyramid is made up of new consumers who are living on less than two dollars a day. C.K. Prahalad, professor at the Ross School of Business at the University of Michigan and recognised as one of the world's top management experts, argued that if we stop thinking of the poor as victims or a burden and began to recognise them as persistent and creative business-creators and conscious consumers of value, it would open up a new world.

Brain Exchange
A "talent exchange" involving a non-physical migration of skills would make it easier to retain talent in countries. This phenomenon, which is set to increase over coming years, is common among companies seeking to increase the productivity of their operations through intelligent location.

Business Angel
Person with investment capacity who provides backing for the early stages of business projects with high growth potential, injecting capital, know-how and experience.

Business-as-usual
The normal running or operations of a company or organisation, especially in the face of extraordinary circumstances or a project or programme that introduces changes in the organisation.

Business incubator
Project or company whose aim is to create and/or develop small companies and support them in the early stages of development.

C

Call centre
This is a functional unit in the company (or a company in itself) designed to handle large volumes of incoming and outgoing telephone calls from and to customers, to back up the organisation's everyday operations.

Cluster
A grouping of independent companies —innovating start-ups, SMEs and large corporations and research and educational bodies— that operate in an industry and region and stimulate the innovating activity. These groupings promote collaboration, share services and resources, exchange knowledge and experiences, contribute effectively to technology transfer, encourage the creation of networks of contacts and disseminate information among companies in the cluster.

Crowdsourcing
The act of outsourcing tasks traditionally performed within an organisation to a large group of people or community through an open call. The open encyclopaedia Wikipedia, in which the definitions and contents are supplied by users, is a well-known example.

CSR
Corporate social responsibility (CSR) can be defined as an active and voluntary contribution to social, economic and environmental improvement by companies, generally in order to improve their competitive situation and market share, as well as their added value. Corporate social responsibility goes beyond simply observing the laws and regulations, although obviously it entails respect and strict compliance for them.

F

Fourth sector
This is a new group of organisations and business models proliferating at the intersection between public, private and social sectors, and heading the new social innovation. It is characterised by carrying out practices that move traditional sectoral borders to create new social relations between agents. Its aim is to carry out innovative activities to fulfil unsatisfied needs in the social or environmental plane.

G

GDP
Gross Domestic Product.

H

Hub
The term is used to identify systems that have a strong dependency on a central point. Specifically, it is used in references to centres of human talent.

I

ICT
Information and Communication Technology; This is the field of emerging technologies that is related to the use of computer resources for storing, processing and disseminating all types of information for different purposes (education, organisation and business management, general decision making, etc.).

INE
Instituto Nacional de Estadística [Spanish National Statistics Institution].

J

Just-in-Time (JIT)
An inventory management strategy that seeks to improve the performance of a business's investment by reducing production inventories and their associated costs to an absolute minimum.

K

Know-how
The particular skills and knowledge of a person, company, research institution, etc.

L

Lean
A general methodology that seeks to minimise the resources needed for production by eliminating the waste (activities that do not contribute added value) that tends to increase costs, delivery times and inventories. The emphasis is on the use of preventative maintenance, quality improvement programmes, on-order management systems and flexible work force and production facilities.

O

Offshoring
Consists of taking part of a business (generally a factory) and transferring it elsewhere, where it will perform the same functions, but with cheaper labour, lower taxes, lower social security contributions or subsidised energy.

Open innovation
New innovation strategy in which companies go beyond the internal bounds of their organisation and in which co-operation with external professionals (customers, providers, collaborators, etc.) plays an essential role in the innovating process.

Outsourcing
Process in which a firm identifies a portion of its business process that could be carried out more efficiently and/or more effectively by another corporation, which is contracted to perform that portion of the business. This frees up the first organisation to focus on its core business.

P

Patient capital
This is long term capital in which the investor is willing to make a financial investment in a business with no expectation of turning a quick profit. The investor is willing to forgo an immediate return in anticipation of more substantial returns down the road.

Although patient capital may be associated with traditional systems of investment, it often refers to investments in environmentally and socially responsible enterprises. In this regard, it may take the form of equity, debt, loan guarantees or other financial instruments, and is characterized by:

- Willingness to forgo maximum financial returns for social impact, and the prevalence of the interests of the end customer over those of shareholders.
- Greater tolerance for risk than traditional investment capital
- Longer time horizons for return of capital

R

R&D
Research and Development.

RDI
Research, Development and Innovation.

S

Social innovation
Any creation or improvement in products and services, reinvention of business processes, creation of new markets or change in the use of distribution channels that addresses social or environmental needs.

SMEs
SMEs (Small and Medium-sized Enterprises).
There is no universal definition of Small and Medium-Sized Enterprises and the term is interpreted differently in each country. In its 2003 recommendations, the European Commission gives the following guidelines:

- Medium-sized enterprise: an enterprise which employs fewer than 250 persons, whose annual turnover does not exceed 50 million euro and whose balance sheet total does not exceed 43 million euro.
- Small enterprise: an enterprise which employs fewer than 50 persons, whose annual turnover does not exceed 10 million euro and whose balance sheet total does not exceed 10 million euro.
- Micro enterprise: an enterprise which employs fewer than 10 persons, whose annual turnover does not exceed 5 million euro and whose balance sheet total does not exceed 2 million euro.

Needless to say, if a company meets more than one of these descriptions, it is the most restrictive one that applies. Under the Commission's recommendation, any company that meets one of these three classifications should be classed as an SME.

Social entrepreneur
A player who responds to market shortfalls with groundbreaking and financially sustainable innovations, who is ideally positioned to help the government address the most complicated social problems. Social entrepreneurs combine business principles with a passion for social impact and have three essential characteristics: social innovation, responsibility and sustainability.

Spin-off
A company created out of the separation of part of the business of a parent company, which then sets up as a separate company. The shareholders of the parent company receive a proportional stake in the new company, thus becoming its initial owners.

Stakeholders
Individuals or groups of individuals who can affect or are affected by a company's activities; e.g. customers, providers, employees, shareholders, residents' associations, trade unions, civil and government organisations, etc.

Start-up
A company in the initial stages of development, generally before it has any established flow of revenue.

V

Venture Capital/Private Equity
Venture capital is a form of investment that focuses on opportunities that have high growth potential but involve greater risk than conventional financial institutions are prepared to support. In exchange for the increased risk, venture capital investors receive a share in the company's equity. Traditionally, the aim of venture capital is not to maintain ownership of the company, but to sell its capital after a period of several years, obtaining a gain on the capital invested in the operation.
In Europe, it is common to use the term "venture capitalists" for all organisations performing this activity. However, in the English-speaking world there is a clear distinction between organisations that centre on the early stages of a company (venture capital) and those that invest in already consolidated companies (private equity).

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