Establishing an Innovation Culture and Strategic Entrepreneurship

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Abstract The purpose of this chapter is threefold: one, to focus on the concept of innovation under today's global economic realities, two, to focus on the strategic entrepreneurship literature, and finally to combine these two pieces together. The chapter concentrates on innovation management in terms of the interrelationship among the four elements of a business: product, process, marketing, and organizational qualities. This chapter provides a review and interpretation of innovation and management literatures in different fields with an eye toward combining them into the framework of strategic entrepreneurship.

1 Introduction

Innovation is about the creation, diffusion, marketization, and practical usage of new ideas and technological advances in an economy. It could take many forms in the production processes such as introduction of new products, production processes, new sectors, or new organizational/institutional quality. As an economic concept innovation could be analyzed in many different perspectives: the micro-level (individuals and ideas), firm-level (entrepreneurship), innovation culture (societal and organizational level), national innovation (state-level) to the broadest one global political economy (international institutions and unregulated global market) levels. For each level, scholars concentrate on distinct features and dimensions of innovation. There is a huge body of research and literature on innovation. In this chapter, we try to analyze it with multilevel perspective and gain well-to-do insight through multidisciplinary approach with integrating political, economic, and management perspectives.

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2 Understanding Innovation in Light of Global Economic Dynamism

In the twenty-first century, we are now living in a global economy in which high level of uncertainty, rapid technological advancements, increasing inequalities, and geo-economics (temporal, spatial, and political economy) are defining features. It is commonly shared that geopolitical competition among the USA, EU, Russia, China, and India is reshaping the world economy and unravelling global power relationships and governance (Leonard 2015).

World economy has seen a deep crisis between late 2007 and mid-2009. The global crisis hit the manufacturing sector most. Under these circumstances, adaptation and innovation capacities of firms have gained extra importance. After the global turbulence of 2007–2009, it has been uncovered that some corporations were caught unprepared to crisis such as General Electric, Toyota, and Sony while some others with a strong innovation culture proved their preparedness such as 3 M and Apple (Dervitsiotis 2010). Market forces have presented reward to winners. Apple's stock was $78 per share in 2008, and it jumped around $250 per share late in May 2010, following the introduction of another big innovation, the iPad. Innovation-driven firms, such as Google, 3 M and BMW, have shown significant profits, managing to satisfactorily withstand the 2008–2009 turbulence (Dervitsiotis 2010). 3 M has never given up its innovation activities even during the crisis times. To support innovation, 3 M consistently allocates 6–7 % of its entire sales revenue ($1.4b in 2008) to research and development.

In the most recent World Economic Forum in the winter of 2016, it has been emphasized that fourth Industrial Revolution is on its way: while the First Industrial Revolution used water and steam power in production, the Second one used electric power for mass scale production, and the Third Industrial Revolution used electronics and information technology, the Fourth Industrial Revolution is characterized by a fusion of technologies that is blurring the lines between the physical, digital, and biological spheres.

In the year 2000, there were almost 360 million Internet users in the entire world; in 2015 this number reached 3.17 billion. Moreover, in 2015, the total number of mobile phone users worldwide reached approximately 4.5 billion. Technology is changing at an unprecedented pace. Within this environment, business world uses an axiom "innovate or die" in order to show the vital place of innovation in the competitive global economic structure. Scholars try to present new perspectives on the dynamics of the national and the global economic structures. All those new perspectives share the view that competitiveness of nations or firms is founded on innovation. Innovation is more valuable in the emerging technologies along with new economic sectors: spin transistors, biotechnology, biomedicine, nanotechnology, robotics, artificial intelligence, digital imaging, etc. have higher return potentials (Hung and Chu 2006). And innovation is not limited to product or process innovation. Novel approaches in the organizational domain are also significant, and they come up with high levels of returns in the competitive world economy. Global

economy is characterized by increasing uncertainties, rapid change, and innovation; thus, it is important for corporate management to stimulate new industries from emerging technologies to provide economic growth, competitiveness, and sustainability. It is easy to see that creating a new sector of economic activity is advantageous since the first entrepreneur to create a new sector enjoys a temporary monopoly.

3 States, National Culture, and Government Structured Innovation Systems

In order to challenge global economic hardships, countries are following similar paths in regards to science, education, technology, and innovation policies. Production of knowledge and technological innovations in the global economy require nation states, all developing or developed alike, to provide support for publicly funded scientific research that leads to the competitiveness and commercialization of products. Supporting research and development, and formulating a national innovation policy especially in developing countries, seems to be essential for economic growth and development. According to an expert report on innovation, after the 2008 global crisis emerging markets have not reduced their pace regarding innovation struggles such as R&D expenditures. Actually some emerging economies have increased their R&D budgets by significantly wider margins than their richer neighbors. Countries such as China, Argentina, Brazil, Poland, India, the Russian Federation, Turkey, and South Africa (in order of R&D spending growth) have shown a very high compound annual growth rate in their R&D spending from 2008 to 2013 (GII 2013).

Under the rubric of national innovation systems, governments assume major roles in designing science, technology, and innovation policies. One of them is to articulate a vision for science, technology, and innovation. Another role governments are expected to assume is finding new sources of economic growth and competitiveness (OECD 2010). Other role for governments is establishing priorities for public investment. Additionally, governments are also taking the leading role in stressing the crucial importance of innovation in strategic sectors and technologies. Dutch and Brazilian governments' initiatives along with China's 12th Five-Year Development Plan and Turkey's Industrial Strategy Document and Action Plan are examples for national schemes to support strategic sectors (OECD 2010). Finally, another role mentioned in the literature for governments is about the role of mediation and engagement with stakeholders and administering incentive mechanisms (Feldman and Kelley 2003; OECD 2010).

Under global economic conditions, governments have seen that technology and innovation are so vital for their national economies, and they have started to establish institutions and necessary legislation to improve their level of domestic innovation. These institutions, agencies, legislation, and macro-policies are

commonly known as national innovation systems (Reichelt 2007). A national system of innovation has been defined as "... the network of institutions in the public and private sectors whose activities and interactions initiate, import, modify, and diffuse new technologies" (Freeman 1995, p. 6). Countries and their respective national innovation systems could be analyzed in two major areas: national cultural peculiarities and the quality of institutional framework.

It is obvious that countries would have a strong desire to institutionalize their technology and innovation policies. For example, Bloomberg Innovation Index provides useful insight about the institutionalization of innovation. This index ranks countries according to their overall ability to innovate with six equally weighted metrics: (1) research and development expenditure as a percentage of GDP, (2) manufacturing value-added per capita, (3) number of domestic high-tech public companies, (4) post-secondary education, (5) research personnel, and (6) number of patents. According to Bloomberg Innovation Index-2015 scores, S. Korea, Japan, Germany, Finland, Israel, USA, and Sweden make the top seven countries in the innovation league.

Under the national innovation systems, central bureaucracies act as regulatory bodies and they promote cooperation and collaboration activities between domestic firms, universities, research institutes, and the public sector. In regards to the institutionalization processes of the national innovation systems, technology transfer is an essential component of any national innovation strategy. Increasing number of technology transfer offices act as all-encompassing interaction mechanism between the research centers including universities and economic actors, companies, and the government (Reichelt 2007). The crucial contribution of technological transfer to the national innovation system is to adapt, absorb, diffuse, and exploit the opportunities provided by external economies rather than the conventional focus on capital accumulation (OECD 2005). In order to improve innovation capabilities, it is essential to invest in technology transfer programs and innovation clusters with local, interregional, and global networks and value chains (GII 2013). In sum, national economies and national systems of innovation are still among the essential domains of both economic and political analysis (Freeman 1995).

As an example for the national institutionalization processes, Sweden created a central government institution, VINNOVA, "the Systems of Innovation Authority" in 2001 (Lundvall et al. 2002). In its official mission statement, VINNOVA declares that it aims at promoting sustainable growth by improving the conditions for innovation, as well as funding needs-driven research. In another case in Taiwan, it could be seen the Industrial Technology Research Institute (ITRI) as the largest national research organization. ITRI announces its mission as setting up new industries and to help existing industries upgrade themselves. Regarding the support of new technological industries by government-induced policies (e.g., integrated circuits, personal computers, notebooks, scanners, and TFT LCDs), the Taiwanese case illustrates a successful model for policy makers (Hung and Chu 2006). In the recent decades, the national innovation system of the United States' NIS model has also become very popular, and many countries started to follow American model particularly its decentralized structures (Reichelt 2007).

Research and development spending as a percentage of GDP gives an idea about the innovation capacity and strength of innovation culture. For example, S. Korea and Japan are one of the most successful countries regarding their innovative capacity buildup with their large and wise allocation for R&D activities. According to a survey, Japan, Switzerland, the United States of America, and Sweden are counted as the world's top 4 innovators among 82 countries (EIU 2007). A most recent report (GII 2013) also ranks three of these four countries as the leading innovators: Switzerland (1st) Sweden (2nd), and United States of America (5th).

It is obvious that a positive correlation exists between the level of national R&D spending and innovative capacity. As of 2014, R&D expenditures as a percentage of GDP is 2.75 % for the USA, 2.05 % for China, 3.58 % for Japan, 4.29 % for S. Korea, 2.84 % for Germany, 3.16 % for Sweden, 2.97 % for Switzerland, 2.25 % for France, 1.19 % for Russia, 0.54 % for Mexico, and 1.01 % for Turkey. In addition to the level of R&D spending, annual patent applications are also included in innovation analyses at the country level. It is important to note that there is a strong growth of patent applications worldwide in the recent decades—by 7.5 % in 2010 and 7.8 % in 2011 (GII 2013). As can be seen in Table 1, emerging markets, and notably China, are now driving the growth in patent applications and making up an increasing share of global patents.

The United Nations Development Programme (UNDP) scales countries along the technology achievement index. It also distinguishes among four categories of countries: innovation leaders, potential leaders, dynamic adopters, and marginalized countries, thus marking countries by their relative position in a world market of technology, innovation, and commercialization (Drori 2010). In the distribution of worldwide patent activities, it is seen that there are five leading economies. Patent offices of the United States, Japan, South Korea, China, and the European Patent Office accounted for approximately 76.5 % of the total patent grants across the world in 2006 (Drori 2010). This picture says that technology creation remains mostly a monopolized domain, and this also means that there has been a dependency structure regarding the technology ownership (Drori 2010; OECD 2010).

In the rapidly changing global economic conditions, governments aim at specializing in niche markets. They follow strategies of conquering niche markets or targeting strategic sectors. Most notable examples are California in the United States of America, Baden-Württemberg in Germany, the Capital Region of the Republic of Korea, Guangdong Province in China, Stredni Cechy in the Czech Republic, and the Mumbai region in India (GII 2013). National governments are required to provide infrastructure for innovation that foster knowledge sharing and knowledge diffusion within innovation hubs. The GII (2013) mentions about the factors leading to the excellence of innovation hubs such as the role of large research universities and multinational corporations. It is certain that increasing competition in the global economic stage has also deeply affected the innovation role of multinational corporations. New trends support the fact that those multinational companies need to organize their innovation processes so as to make them competitive and sustainable (Fallah and Lechler 2008).

Table 1 Total patent applications by countries (residents and nonresidents total)

	2000	2004	2008	2012	2014
USA	295,895	356,943	456,321	542,815	578,802
China	51,906	130,384	289,838	652,777	928,177
Germany	82,246	82,280	89,077	88,625	91,637
France	24,144	25,370	25,470	26,534	27,139
Sweden	7373	5659	5995	5906	6293
Switzerland	6112	6839	8005	9609	8902
S. Korea	102,010	140,115	170,632	188,915	210,292
Russia	32,337	30,190	41,849	44,211	40,606
Mexico	13,061	13,198	16,581	15,314	16,135
Turkey	3433	917	2397	4666	5501

Source: World Intellectual Property Organization http://www.wipo.int/pct/en/

Another dimension of the national innovation systems is the cultural drivers. A major highlight in the innovation studies is that creative learning and organizational characteristics are predominantly a socially embedded process that could only be wholly understood by looking at cultural and institutional backstage (Lundvall 2010, p. 1). For example, there are deep differences between Asian and Western cultures. Yet within the same Western club, cultural differences might cause distinct outcomes in the technological and industrial policies. For example, while the Swedish innovation policies have been focusing on promotion of process innovation, the Danish policies focused on experience-based incremental product innovation in low technology sectors (Lundvall et al. 2002, p. 227). Several studies have shown that countries may organize their developmental programs in line with their societal values and achieve economic growth with their styles:

> The Danish economy is one of the most egalitarian in the world in terms of income distribution, and it is among the ones with the highest GNP/capita. The growth success of the USA has gone hand in hand with increasing inequality. The experience of Denmark demonstrates that there is no necessary connection between strong growth and growing inequality" (Lundvall et al. 2002, p. 219).

Nonetheless, despite of cultural differences, countries have also tended to converge on successful models. For instance, in the 1980s and 1990s, East Asian economic success stories, namely Japan and S. Korea, created widespread interest for applying Asian management techniques to Western business world. With the beginning of the new millennium this time, the gravity of the world economics has shifted to China, and, in general, Asian business practices have come under spotlights. The comparison has been mainly between the individualistic and collectivistic work ethics. Some scholars, for instance, mentioned about the long-term character of interfirm relationships in Japan and vis-a-vis the arm's length relationships in the Anglo-Saxon cultures (Lundvall et al. 2002, p. 219).

In order to benefit from cultural diversity and its contribution to innovation, 3 M is a distinct case. The company follows a specific organizational policy to exploit opportunities. In its self-description, 3 M expresses that its organizational structure

has been designed to gain strength from diversity: 3000 of its more than 10,000 technical employees are located outside the USA. These technical employees work in research-based laboratories in 34 different countries. The result is a highly skilled global workforce uniquely positioned to create proactive solutions for market demands.

4 Strategic Entrepreneurship, Organizational Culture, and Innovation

The process of innovation has been poorly understood since it is seen as a creativity-based random process; however, recent surveys, which are able to measure business world's pulse, expose that competitive advantage and innovation performance is the direct result of effective innovation management (BCG 2015; Dervitsiotis 2010). Allocation of large R&D budgets does not guarantee innovation outcomes or profit. In the real world cases, technology companies like Motorola did not realize a rival competitor's rise: Nokia. Today, "Nokia is the global market leader in handsets and is rapidly expanding its portfolio in infrastructure, gaming, and other broadband applications" (Fallah and Lechler 2008, p. 59). Global surveys also show that success depends on institutionalization of innovation management. There are many cases to support this fact. For example, what makes Google one of the most innovative companies in the world is hidden in the words of its CEO Larry Page: *"The people behind the scene which makes Google the company it is today. We hire people who are smart and diligent, and we prefer the ability over experience…" (Google Case).* This is a deliberate company policy to prioritize ability over seniority. Another one is a pharmaceutical company, Gilead Sciences Inc., which is included in the most innovative companies' 2015 list as the 8th. One of the reasons for the success of Gilead's innovative capacity is related to its top management team who combines technical expertise with an equally deep knowledge of market demands (BCG 2015).

Since its early times, innovation studies highlighted critical place of institutionalization processes. Taking into consideration importance of institutions for innovation and learning processes, it is useful to remind that *institutions* are understood as norms, habits, and rules are deeply ingrained in society, and they play a major role in determining how people relate to each other and how they learn and use their knowledge (Johnson 1992 cited in Lundvall et al. 2002, p. 219). Successful firms "manage to use the entire company as a new-idea laboratory" (BCG 2015). For example, 3 M's renowned "Innovator Award" is a well-thought incentive to enhance innovation. In 3 M, staff can devote 15 % of their work time to self-directed projects, and this award is given to employees who use their 15 % self-directed work time to develop a new product or technology (Case 3 M). Similarly, to promote new ideas, Google encourages all engineers to spend 20 % of their time working on their own ideas. Take one of Google's most innovative practices: its

policy of giving 20 % free time to engineers to work on independent projects. Initiated in 2004, the policy has begun innovations such as Gmail, Google News, and Ad Sense (Google Case). Another case is LinkedIn which launched its "InCubator" program in 2012. According to this program, engineers can get 30–90 days away from their regular work to develop ideas: employee with an idea to organize a team and pitch their project to executive staff once a quarter. Those whose ideas are greenlit by cofounder Reid Hoffman and CEO Jeff Weiner, among others, then they get up to 3 months to spend developing that project.

Innovation could be about creating a new product or a new process that ultimately makes life easier and more comfortable. In other words, innovation is "...the generation, acceptance, and implementation of new ideas, processes, products, or services" (Mclean 2005, p. 227). In the new millennium, it is commonly agreed that economic success and growth depends on knowledge, information, and innovative economy. The corporate success in turn depends on employees' level of knowledge, job experiences, and creativity. Employees' creativity provides high levels of return to the companies. Creativity engenders new ideas, and this could potentially transform into a new product, process, or service, which ultimately leads to profit for companies. In the past, early innovators concentrated on individual talent. William McKnight, who was 3 M's unassuming CEO during the 1930s and 1940s, famously said that "Hire good people and leave them alone." McKnight accordingly encouraged employees to spend 15 % of their time noodling on their own projects, and this policy still survives at 3 M (Cain 2012). Keeping employees happy is a strong value; accordingly, Google created a unique work environment that attracts, motivates, and retains the best players in the field. Google is chosen as the number 1 place to work for the seventh time in 10 years by the Fortune magazine according to its 2016 report. On their Mountain View, California, campus called the "Googleplex," employees are treated to free gourmet food options including sushi bars and espresso stations (Google Case).

It is interesting to note that the concept "quality" has evolved in line with innovation. The word "quality" has evolved from (1) product-related quality to (2) process (fitness for production and delivery) to (3) searching for new value-generating options (fitness for innovation) to (4) developing new organizational designs or fitness for adaptation (Dervitsiotis 2010).

Then, we could safely say that the most important input in the production processes is knowledge and its management with institutional mechanisms. And the most vital process is both organizational learning and knowledge management during the production processes. In the organization studies, it has been emphasized that firms with inner learning dynamics are more productive and more innovative. Promotion of organizational change through education and training (Lundvall et al. 2002) is crucial for innovative capacity. In the new age of the globalization, it should be highlighted that "The fact that knowledge differs in crucial respects from other resources in the economy makes standard economics less relevant ..." (Lundvall 2010, p. 1).

4.1 Product and Process Innovation

It is obvious that a successful firm develops and introduces new products to the market as its primary driver is to make as much profit as possible. In this regard, this firm is supposed to follow some preliminary steps before introducing its new product.

Potentially, a firm could perform different types of changes in its production processes so as to improve its productivity or commercial performance. These positive changes might be conceptualized under four types of innovations: product innovation, process innovation, organizational innovation, and marketing innovation (OECD and Eurostat 2005). Product innovation can be defined as "the introduction of a good or service that is new or significantly improved with respect to its characteristics or intended uses. This includes significant improvements in technical specifications, components and materials, incorporated software, user friendliness, or other functional characteristics" (OECD and Eurostat 2005, p. 48). On the other hand, definition of process innovation could be made as "the implementation of a new or significantly improved production or delivery method. This includes significant changes in techniques, equipment, and/or software" (OECD and Eurostat 2005, p. 49).

If we look at the practical side of the business world, it might be insightful. One of the declared company values of 3 M is to see the future (or going beyond). 3 M sets goals to challenge for significant improvements. One objective is to generate 30 % of all sales from new products introduced in the past 4 years. However, 3 M's commitment to stretching goals is demonstrated through an additional objective: to cut the time for new products to reach the market by a further 50% (3 M Case).

Moreover, practitioners suggest that "Product development occurs when investment in research and development leads to new and innovative products. This usually involves phases such as idea generation, testing, engineering, prototype creation, commercialization, manufacturing, and marketing." (3 M Case). Product development may take so many years, and it requires significant capital investment; therefore, 3 M uses the term, "patient Money" (3 M Case). Investments in global innovation reach have at least a 3-year time lag. Companies have to make adjustments in reaction to these influences in a tactical manner, without changing their strategic direction (Fallah and Lechler 2008, p. 70). Many innovations require a lengthy period, often of some years, from the time when they become available to the time when they are widely adopted. Thus, strategic entrepreneurship requires an effective management of this lengthy process keeping always in mind the main goals of enterprises as value creation.

With an increasing rate of change in the global economy, especially after the onset of the 2008–2009 economic crisis, innovation management emerges as a powerful way to facilitate a firm's adaptation to new conditions. Knowledge management is seen as the principal ingredient of competitiveness, innovation, and economic prosperity. Scholars suggest that the most important competitive advantage is derived through more valuable, rare, imperfectly imitable, and

nonsubstitutable resources than those held by competitors (Barney 1991). This is also known as the *VRIO* framework: *value* (V) means whether it provides competitive advantage, *rareness* (R), or whether competitors possess it, *imitability* (I), or whether it is costly for competitors to imitate, and *organization* (O), or whether the firm is organized to exploit the resource (Barney 1991; Terziovski 2010).

Entrepreneurs identify and exploit opportunities that their competitors have not yet observed or have underexploited. An appropriate set of resources is required to exploit entrepreneurial opportunities with the greatest potential returns. There are both competitive and cooperative ways of observing other firms. Some firms prefer to imitate while other firms tend to perform complementary innovations. Firms engage in new business opportunities according to different Schumpeterian strategies (or combinations of them). Earlier studies introduced five major Schumpeterian strategies: pioneers, adaptionists, imitators, complementors, and mixed strategies. Thus, the complementor strategy tries to complement the efforts of the other player by investing in its own, but related, business niche. In many cases, there will be a symbiosis between complementors and pioneers (Lundvall et al. 2002, p. 223).

As the knowledge-based economy develops, innovation and technological development go hand-in-hand, and they shorten product life cycles. Particularly in the manufacturing industry, the product life cycles are steadily decreasing. In our daily lives, we witness rapidly changing models of electronic products such as computers and mobile phones (Hsu 2005). An expert report suggests the speed of innovation processes is critical, and successful innovators demonstrate their ability to shorten innovation and product development cycles and reduce time to marketization (BCG 2015). Due to the speed of the technological advancements, product life cycle management has become a prominent feature in organizational theories. In order to optimize product and process innovation, firms increasingly rely on automated product life cycle management systems that facilitate entrance and marketing of new products and services.

Moreover, while implementing knowledge management, firms could advance their value-creation capabilities and enhance their managerial decisions (Alavi and Leidner 2001). It has been widely accepted that knowledge is a significant organizational resource. While employing organizational knowledge and knowledge management techniques, scholars highlighted the significance of IT in support of these processes and information systems, commonly known as knowledge management systems. A knowledge process includes acquisition, conversion, application, and protection that are essential organizational capabilities or "preconditions" for effective knowledge management (Gold et al. 2001). Effective knowledge management includes business intelligence, collaboration, distributed learning, knowledge discovery, knowledge mapping, opportunity generation, as well as security. It is certain that creativity and innovation have a strong positive correlation. Yet creativity is analyzed mostly at the individual level; however, "innovation is the process by which these ideas are captured, filtered, funded, developed, modified, clarified, and eventually commercialized and/or implemented" (Mclean 2005, p. 240). Nonetheless, it is important to note that there is a potential danger: "It

seems almost counterintuitive that strong innovators would emphasize process. After all, R&D is a creative function, and too much process management runs the risk of squelching the very creativity that is the lifeblood of innovation" (BCG 2015, p. 11).

4.2 Organizational Innovation and Marketing Innovation

Innovation is a dynamic and multidimensional concept. Meanwhile, there is not a guarantee for new product to be successful; it is likely to fail as well. Therefore, for firms it is a challenge to successfully market their innovations. In other words, because of novelty, innovation comes with a certain degree of uncertainty and risk. A specific innovation is regarded as successful if and only if it can be taken to market to generate cash (Dervitsiotis 2010). For this reason, innovation excellence requires both a high level of innovation capability to create a sustained stream of successful innovations and new streams of cash revenues.

Taking into consideration the adoption of new products with an unknown level of uncertainty, scholars and practitioners have developed some conceptual arrangements in regards to organizational innovation. In a rapidly changing world, scholars observe a paradigm shift in the management of global innovation that has been occurring as the result of two fundamental forces of the knowledge economy: instantaneous market demands and expanding sources of technological knowledge. New conditions of the global economy require firms to synchronize their organizational processes so as to "allow technology and market knowledge to connect in a timely manner no matter where this knowledge resides in the company and to allow the best innovation ideas to move forward" (Fallah and Lechler 2008, p. 67). Toyota is a good example: Based on the corporate philosophy of "customer first" and "quality first," Toyota Motor has been able to combine customer needs with available technological advancements. Additionally, another case, 3 M, tells us corporate vision to see the future or foresight. For 3 M, it is vital to, ". . .anticipate the structure of the future before it arrives." 3 M can solve articulated needs, whereby the customer knows and communicates what they need, as well as unarticulated needs, whereby 3 M proactively provides a solution for a problem that the customers don't yet realize they have!

Firms need to develop expertise in and a culture for converting research-based innovations into marketable products. On this matter, we have a concept, commercialization, which is about the processes of turning a new idea into a marketable good or service. Commercialization could be defined as the processes undertaken by firms to transform knowledge and technology into new products, processes, or services, in response to market opportunities (Rosa and Rose 2007).

Xerox in the early 1970s introduced several important innovations that later shaped the computer industry (the Graphical User Interface, the Ethernet, the Adobe document format, etc.), but failed to commercialize them because of its restrictive focus on printing technology. These innovations were exploited

successfully by Apple and other firms providing them with a unique competitive advantage (Drori 2010). Google is one of the most-known and most successful companies in the world in terms of commercialization; we even use "googling" as the term to refer to searching information on the Web. It started as a student project by Larry Page and Sergey Brin in 1996; Google became the most frequently used Web search engine on the Internet with six billion searches per day as of late 2015 along with other innovative applications such as Gmail, Google Earth, Google Books, and Google Maps. All those successful cases sign the critical importance of ability to combine innovation with market realities.

In the aftermath of the 2007–2009 global economic crisis, it is reported that large companies aim for growth and in their search for growth the biggest challenge is seen as the organizational issues. Another concern in the so-called global survey was the commercialization issues. Many business leaders mentioned about the commercialization as one of their biggest challenges (McKinsey 2013). As a successful case in regards to marketization of innovation, 3 M presents interesting insights. 3 M has achieved sales revenue of $US25.3 billion in 2008. Almost 64 % of 3 M's entire sales revenue originates from international operations. In its self-description, 3 M reveals that it has key values underpinning its continual success. These values include its commitment to customer satisfaction with superior quality and commitment to investors with an attractive return through sustained and high-quality growth (3 M Case).

4.3 Strategic Management or Entrepreneurship?

Under the realities of global economic competition, firms, SMEs, or large corporations alike take positions so as to be adaptable and benefit from changes in the market environment: they exploit opportunities and search for better strategies in order to strive (Hitt et al. 2001). It is also important to note that while taking strategic positions firms also take into account national and cultural peculiarities. These strategies could be analyzed under the strategic entrepreneurship literature or strategic management literature. Both of them try to discover business opportunities and develop them towards competitive advantages (Hitt et al. 2001). Thus, this study employs both of these concepts interchangeably. This study takes strategic entrepreneurship with its organizational connotations so as to include resources, organizational learning, and innovation.

It is becoming more apparent that investment in technical and organizational knowledge along with human capital is vital element for firms to achieve competitive advantage. As said before, strategic entrepreneur is mostly about identifying and exploiting opportunities (Hitt et al. 2001). Strategic entrepreneurship involves discovering newness and novelty in the form of new products, new processes, and new markets as the drivers of wealth creation (Ireland et al. 2003). This is predominantly about strategic decision-making and corporate governance processes.

There are four major tools that strategic entrepreneurship employs for innovation management: institutionalization of the work place, enhancing organizational culture, encouraging collaboration and coordination within the firm, and open innovation approach so as to attach employees with outside partners and experts. Besides, managing the effectiveness of the innovation process requires a balanced set of innovation metrics related to all innovation drivers, i.e., leadership, culture, and people participation together with innovation results, such as time to market and financial metrics.

The literature commonly agrees that organizations that rely on formal strategies perform better than those without strategies (Terziovski 2010, p. 895). A key conclusion in these surveys is that the innovation process can be improved significantly only by institutionalizing innovation management and making it a core process, in the same way as was done with quality management and finance management (Dervitsiotis 2010).

We sought to identify the key contributions of knowledge management capability. Such contributions may include: improved ability to innovate, improved coordination of efforts, and rapid commercialization of new products. Other contributions may include: the ability to anticipate surprises, responsiveness to market change, and reduced redundancy of information/knowledge (Gold et al. 2001). Companies need to consolidate and reconcile their knowledge assets. In order to achieve competitive sustainability, many firms are launching extensive knowledge management efforts. However, many knowledge management efforts are misguided as information projects. Moving beyond information management and into the knowledge management framework is a complex undertaking involving the development of institutional structures that allow the firm to recognize, create, transform, and distribute knowledge (Gold et al. 2001).

MNCs vie to optimize their global innovation reach. In particular, companies in research-intensive industries have recognized that expanding global innovation reach is important to maintaining competitiveness. They are exploiting three different sources of competitive advantage (1) by seeking access to technological knowledge in countries with high R&D intensity; (2) accessing cheaper labor and operating flexibility; and (3) accessing market knowledge (Fallah and Lechler 2008, p. 63).

Another major tool regarding strategic entrepreneurship is about organizational culture. Having awareness on the value of change or novelty modern companies are supposed to establish a business culture and accompanying organizational structures and processes that make innovation a working mechanism. Example could be given about an organizational value held by 3 M. Celebrated aspect of 3 M's workplace culture is 15 % rule that encourages employees to explore and work together to generate ideas. 3 M also prioritizes organizational learning with external sources and cultural features. Communication is a majör value in 3 M. 3 M feels that successful people need to work with others; thus the company uses technical forums, trade fairs, and conferences to encourage networking and ideas sharing. Staff use part of their 15 % self-managed time to help people from other areas. Networking occurs internally across platforms and externally through customer

feedback and joint ventures. Staff can be transferred locally and globally and apply their particular expertise on projects. This adds value by sharing both expertise and the experience of 3 M's diverse global culture (3 M Case). Additionally, we could see another case: Toyota established an employee suggestion system. The Creative Idea Suggestion System was established in 1951. As of early 2016, the total number of suggestions surpassed 40 million.

Findings suggest that an innovation culture scale may best be represented through a structure that consists of seven factors identified as innovation propensity, organizational constituency, organizational learning, creativity and empowerment, market orientation, value orientation, and implementation context (Dobni 2008). Organizational culture is defined "as a system of assumptions, values, norms, and attitudes, manifested through symbols which the members of an organization have developed and adopted through mutual experience and which help them determine the meaning of the world around them and how to behave in it" (Janićijević 2012). Prior research found that organizational culture has an influence on the process of innovation within organizations because the organizational context can serve as a supportive factor for innovation. The authors pointed out that there were six supporting scales that influenced creativity. This included: (1) organizational encouragement, (2) supervisory encouragement, (3) work-group supports, (4) work freedom, (5) sufficient resources, and (6) challenges at work. Similarly, several scholars have indicated that organizational culture affects creativity and innovation within the organizations through encouragement, support, and implementation. Many dimensions of organizational culture have been found to affect organizational innovativeness, such as learning and development, participative decision making, support and collaboration, power sharing, status differentials and communication, and tolerance for conflict and risk.

In 3 M, product development is driven by the cross-fertilization of ideas and new technologies shared across the entire company: "Products belong to divisions, but technologies and ideas belong to the company" (3 M Case). 3 M has developed six principles of innovation to support this culture. Google is also one of the best companies that successfully combine technological innovation with a strong organizational culture.

It is ironic to see that "... culture can be a highly effective killer of new ideas" (BCG 2015, p. 20). A successful innovator organization enables a working environment and culture that enable to set the breeding ground for engaging the creative talents of employees, providing opportunities for creative interactions and making good use of the ideas generated by other sources. Moreover, cultural openness to innovation is an organizational quality. In other words, generating innovative ideas and turning them into commercial usage require an enabling institutional context. As important, a critical part of innovativeness is the cultural openness to innovation (Dobni 2008). This environment constantly encourages firm workers to seek novelties and promotes a climate favorable to change and creativity. As an example for a cultural milieu to support creativity, Google is appropriate. Google's company culture is reflected in their decision making as well. Decisions at Google are made in teams. Even the company management is in the hands of a triad: Larry Page and

Sergey Brin hired Eric Schmidt to act as the CEO of the company, and they are reportedly leading the company by consensus. In other words, this is not a company where decisions are made by the senior person in charge and then implemented top down. It is common for several small teams to attack each problem and for employees to try to influence each other using rational persuasion and data. Organizationally, Google maintains a casual and democratic atmosphere, resulting in its distinction as a "Flat" company. The company does not boast a large middle management, and upper management is so hands on, it's hard to qualify them in a separate category. Teams are made up of members with equal authority, and a certain level of autonomy is maintained. This techno-democracy takes a good deal of effort to maintain (Google Case).

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