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Innovation and its Importance for Competitiveness in Mexico

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Abstract

The integration between innovation and business is a key factor in competitiveness between organizations. That is, innovation applied to a business makes no sense if not considered as an integral tool for the processes of the organization. Companies should therefore adopt a policy where innovation plays a strategic role in the design of business models to become lean, effective and competitive entities (Moraleda, 2004). The objective of this paper is to show the importance of innovation within companies, identifying the concept, the various models that different entities might adopt in order to develop better processes of innovation, as well as indicators that represent innovation at global and national levels in order to develop strategies that lead to an increase in competitiveness. For this work the method used was a bibliographical review of relevant articles from a range of authors was conducted.

Keywords: Innovation; Competitiveness; Mexico.

1. Introduction

Change is not easy to accomplish, neither for companies nor for humans. Garibay and Herrera (2008), state that humans are in an eternal conflict between curiosity and desire for change and novelty versus a desire for security and tranquility. All changes imply a certain degree of uncertainty and it is therefore logical that companies and organizations, even those that have enjoyed recent success, tend to avoid those types of innovation where possible gains come with the risk of significant losses, where levels of uncertainly are simply too high.

The same authors mention that it increasingly evident that in a free market, companies that do not change are destined to face extinction. However, despite the obvious importance of innovation and the fact that business leaders recognize it as key to their strategies, most businesses lack a clearly defined agenda when it comes to the practicalities of innovation.

Villapalos (2012) states that innovation today is considered to be one of the contributing factores to the development of advanced economies, and it goes far beyond the simple incorporation of new technology. It must help businesses foresee fluctuations in market forces and detect new and better products, services and processes which generate benefits at the lowest possible cost. Innovation manifests itself as a reaction to the changes inherent to the globalized marketplace.

The same author describes how in order to achieve increased productivity through innovation it has been necessary to trigger bring about radical changes to both economic and organizational management models. Whereas before they were based around labor and capital, they have – as of the mid nineties – started to focus on critical factors such as: knowledge, training and intellectual capital. Furthermore, this economy based around knowledge is gradually evolving into an economy driven by knowledge, in which knowledge becomes the fundamental management tool governing all other processes in the business. This implies efficiently managing previously unheard-of quantities of data. It is precisely the aim of the business to have the right information at the right time accessed by the right people in order to gain advantages and stand out from the field. Regional innovation policies, which attempt to assess the needs of local companies, base their efforts largely on facilitating access to relevant information in promotion of innovation, efficiency and ultimately competitiveness.

The following article looks at the concept and characteristics of innovation, several authors' opinions about models of innovation as well as the sources of innovation, the value chain of innovation, the global and national situation with regard to innovation indicators and finally the idea of innovation as a factor for competitiveness.

2. Development

2.1. Concept and Characteristics of Innovation

For Porter (1998), innovation manifests itself through the design of a new product, a new process for making a product, a new focus in the marketplace or a new way of training. Most innovation is mundane and incremental, it depends more on the accumulation of different points of view than a simple technological process. This frequently involves ideas that are not in themselves new, that is, ideas that already existed but had not previously been considered. Innovation involves investment in skills and knowledge and fixed assets, as well as brand creation, consolidation and prestige-building.

Afuah (1999), defines innovation as the use of new knowledge to offer a new product or service which is desired by customers. It is invention plus commercialization. According to Damanpour (1991), the new knowledge can be technological or market related. Technological knowledge is knowledge of the components, links between components, methods, processes and techniques that form part of a product or service. Market knowledge is knowledge of the channels of distribution and product applications as well as the expectations, preferences and needs of customers.

Afuah (1999) states that an innovation has two characteristics the first of these being organizational vision, which is the extent to which the innovation affects the capacities of an organization. According to this vision an innovation is classed as radical if the technological knowledge required to exploit it is very different to the existing knowledge or makes existing knowledge obsolete. At the other end of the spectrum we have incremental innovation in which the knowledge necessary to offer a product is based on existing knowledge. .

The second characteristic is the economic vision (competitiveness), according to this vision an innovation is said to be radical if it is so superior (lower cost, better attributes, newer attributes) that existing products are rendered uncompetitive. However, innovation is classed as incremental if existing products continue to be competitive.

Authors such as porter and Afuah define the characteristics that innovation should include and they are at pains to clarify that the use of new hardware and cutting edge software does not in itself constitute innovation. The authors explain that innovation goes beyond the mere updating of computer systems, it is a process that fosters competitiveness in organizations and moreover that requires certain criteria to be met before it can be deemed as innovation.

2.2. Models of Innovation

Afuah (1999), identifies several models which explain why some incumbents are early adopters and exploiters of radical change, and why on occasions they are less likely to exploit more incremental forms of innovation. The author divides these models into static and dynamic categories. Static models exploit a cross-section of skills within a company as well as the knowledge that underpins these skills and the incentive to invest at a given time. Dynamic models adopt a longitudinal vision of innovation and explore its evolution post-introduction.

Among the static models the following are mentioned:

Abernathy and Clark (1985), This model offers an explanation as to why incumbents can outperform new participants when confronted with radical innovations. The model suggests that there are in fact two types of knowledge that underpin innovation: technological knowledge and market knowledge. As such, the technological ability of a company could become obsolete while its market capacity could remain intact. If such market capacity is substantial and hard-earned, an incumbent whose technological capacity has been undermined can use market capacity to seize an advantage over a new participant.

Henderson and Clark (1990), These authors suggested that if products are normally comprised of integrated components, building these products will demand knowledge of both the components and the ways in which they are integrated, this latter knowledge is defined as architectural knowledge. An innovation can impact upon component knowledge, architectural knowledge or indeed both, with differing consequences for the company that has innovated.

Hambrick and Mason's Model of Strategic Leadership (1984), The strategic leadership model states that the strategic incentive to invest in an innovation or the failure to exploit it as a result of destroyed competencies takes place only after the upper echelons or management have recognized the potential of innovation. Finkelstein and Hambrick (1990), show that the capacity for upper management to recognize the potential of an innovation is a function of their managerial logic or worldview which at the same time depends on directorial experiences, the logic of the organization and the logic of the industry as a whole.

The Matrix of Familiarity Model

Assuming that the upper echelons of management have indeed recognized the potential of an innovation and have decided to adopt it, will the business be successful as a result? This depends on the mechanism that is used to adopt said innovation, according to Roberts and Berry (1985). They state that upon adopting an innovation, a company can choose between seven mechanisms: internal development, acquisitions, licensing, internal ventures, joint ventures, venture capital and educational acquisitions depending on how familiar or unfamiliar the technology or market may be.

Examples of dynamic models include the following:

The Utterback and Aberthany dynamic model for innovation (1978), The authors detailes the dynamic processes that take place within an industry and its entities during the evolution of a technology from the fluid phase, through the transitional phase and up to the specific phase.

The implications of this model are that as the technology evolves through the different phases, so the company requires different sets of skills in order to benefit from the technology.

The Tushman-Rosenkopf Model for Technology Life Cycle

An important question in the exploration of the dynamic of an innovation is: to what extent can a company influence the evolution of an innovation? For example: to what extent can a company guide its design toward an industrial norm? Tushman and Rosenkopf (1992), suggest that this depends on the amount of technological uncertainty, which in turn depends on the complexity of the technology and the stage of evolution.

The implications of the Tushman – Rosenkopf are that success in the different phases of the life cycle hinges on the different skillsets enjoyed by the company. One function of the complexity of the product is how effective these skills are in influencing the evolution of the technology -in other words- the more complex the innovation, the greater the level of interference to be expected from sociopolitical factors during the evolution of the technology.

The Foster S-Curve Model (1986): Here it is stated that the index of advancement of a technology is a function of the amount of effort invested in the technology and this tends to trace a curve in the shape of an S. Technological progress starts slowly, then speeds up rapidly and finally diminishes as the physical limits of the technology are approached. With time, the rewards for effort become extremely small. According to Foster it is then necessary to use a new technology whose underlying physical properties allow it to overcome the physical limits of the old technology.

What type of business has the best chance of innovating? For years this conundrum has entertained those studying management. Some of the models presented here attempt to provide better answers to this question synthesizing systems to determine who has the highest probability of introducing and exploiting innovation.

2.3. Sources of Innovation

Von Hippel (1988), identifies two types of innovation source; the functional and the circumstantial. Functional sources answer the following questions: Where does innovation come from? Does it come from inside or outside the company? Where exactly in the company? Circumstantial sources answer the following question: When and under what circumstances can innovation be expected? According to the author there are five main functional sources of innovation for an organization:

- Its own internal functions
- Suppliers, customers and complementary innovators
- Academic, public and private think-tanks
- Competitors and related industries
- Other nations and regions

Its own internal functions: Some larger companies spend a considerable percentage of their revenue on research and development activity with a view to generating the ideas which lead to innovation. But these ideas don't always stem from research and development. In the execution of their value-adding work, divisions within manufacturing, commercialization and service areas also have the opportunity to contribute to innovation. In some industries, lower costs and/or differentiation are achieved thanks to innovations made in manufacturing.

Suppliers, customers and complementary innovators: In this regard the author showed that manufacturers are not always the courses of innovation. Suppliers, clients, complementary innovators, financiers, distributors and any other entity which benefits from innovation can also be a source of innovation. The author defines complementary innovators as those companies whose products are decisive for the success of a manufacturer but over whom the manufacturer has little or no influence. As a supplier, a complementary innovator can contribute innovations to the benefit of a primary product in order to be able to sell more complementary products. As a client, a complementary innovator may need to add features to the primary product in order to facilitate the task of developing complementary products. Complementary innovators might discover that upon adding certain characteristics to the primary product, their complementary products work and sell better.

Academic, public and private think-tanks: Although basic scientific research is generally conducted without a particular product or service in mind, it can still be a source of innovation for companies to commercialize. Normally, the results of basic research are published in articles and presented at conferences and are consequently in the public domain. If a company believes these results to be promising, it can conduct further research in the same area, this time focusing on specific applications, in other words, it can conduct applied research. Research carried out my academic, private and public think-tanks is therefore not limited to basic research, it extends to applied research also.

Competitors and related industries: Often, research by a company's own research, alongside leaks from other companies and basic research by external scientists all contribute to the acquisition of technological knowledge which in turn forms the basis for innovation. The key is to be adept at integrating information that arrives from diverse sources.

Other nations and regions: Some countries ae better than others at innovation. For example, the US leads the way in pharmaceutical products, biotechnology, software, film and TV content, aerospace manufacturing etc. Japan and South Korea are at the cutting edge of electronic products and components. These examples indicate that some nations can be better sources of innovation than others.

In terms of circumstantial sources of innovation, Von Hippel (1988), mentions that some innovation comes from planned activities on the part of a company.

Where do new ideas come from? Do they originate inside or outside a company? Understanding sources of innovation can allow a company to assign resources more effectively in the search for innovation. Giving a company a better chance of recognizing the potential of an innovation helps it to comprehend who its main competitors are.

2.4. Innovation as a Factor of Competitiveness

For Porter (1990), companies achieve competitiveness through acts of innovation, which includes not only new technology, but also new ways of doing things.

Many innovations bring competitive advantages by creating completely new market opportunities or serving previously neglected market segments. Competitive advantages are accentuated when competitors respond sluggishly to these innovations.

The author also mentions that in international markets the innovations that generate competitive advantage tend to anticipate both domestic and external needs.

Information plays a key role in the processes of innovation and refinement. Sometimes this information comes from simple investment in research and development or market research.

With a few exceptions, innovation is usually the fruit of hard work. A company that successfully implements a new or better way to compete has invariably managed to do so after showing stubborn determination, shrugging off harsh criticism and overcoming many hurdles along the way. To flourish, innovation generally requires a pressing need, high pressure conditions, and often adversity: the fear of losing frequently outweighs the hope of winning.

Once the company enjoys competitive advantage through innovation, this can only be maintained through commitment to continuous improvement.

Competitors will eventually and inevitably get ahead of any company that allows improvement and innovation to grind to a halt. Sometimes the advantages enjoyed from being the best at customer relations, economies of scale with existing technology or loyalty in the supply chain are insufficient for a stagnant company to maintain a position in which it has been entrenched for years or perhaps decades

Finally, the author establishes that in order to maintain competitive advantage over time, it is necessary to update it

According to the Foro Ecónomico Mundial (2012), the Global Competitiveness Index states that in its first stage of development, a country's economy is driven by a series of factors like unskilled labor and natural resources. It is here that four elements (institutions, labor, macroeconomic environment and infrastructure) play an important role in what have been called factor-driven economies.

As a country becomes more competitive, so productivity increases, and wages rise as a byproduct of development. Countries then proceed to a new phase defined by the efficiency of their development, during which focus switches to developing more efficient production processes and higher quality products to meet the demands of higher earning consumers and avoid general price increases. Here competitiveness is increasingly influenced by phenomena known as efficiency enhancers.

When countries progress to the phase driven by innovation, earnings will have increased so much that the consequently high standard of living can only be sustained if companies are able to compete with new and unique products. During this phase, businesses must compete via innovation, seen in the production of new and different goods and the use of more sophisticated production processes.

Innovation is one of the fundamental factors for the generation of competitiveness in business. The creation of competitive advantages through innovation should be the lynchpin of any business that desires sustainable development; however, it is important to think of innovation as a continuous process, otherwise, competitors are likely to introduce radical technologies and render a stagnant company's existing competencies obsolete.

3. Conclusion

Models contribute to better understanding for those who intend to introduce or exploit an innovation. These contributions are summarized in a series of questions which are central to the gathering and processing of data which underpins the introduction and exploitation of the innovation. In other words, the how, who, what, when and how much of the innovation.

A company's research and development department is not the only source of innovation. Up and down the value chain are myriad sources of innovation and in addition there are suppliers, customers, competitors, related industries, universities and other nations, all of which can also be sources of innovation.

Innovation represents a broad concept that goes beyond just technology, it is often through innovation that advantages such as differentiation and cost reduction are achieved. Frequently innovation occurs as a consequence of an unexpected situation, but it is also created through processes of research and development within organizations.

Mexico's indices of intellectual property compare very poorly to levels in countries that lead the way in terms of innovation. The need for government policy initiatives to drive investment in research and development is clear for all to see, but it is also fundamental that the private sector support the government in this effort - along with universities and other educational institutions - so that better links may be established between businesses, government and wider society through investigations that bring new knowledge and foster continuous innovation. Of course, Mexican businesspeople look for good returns on their investments, but they must also consider the improvement in standards of living that their employees deserve. Working collaboratively it will be possible to achieve much-anticipated economic growth that the country requires in order to reach its potential in terms of competitiveness.

Without innovation companies simply stagnate and competitiveness falls by the wayside.

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