

## Análisis de tema la dimensión estratégica de la innovación Tecnológica

*Analysis of the subject on Strategy theme of technological innovation*

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### Resumen

Este ensayo tiene como objeto analizar la dimensión estratégica de la innovación tecnológica. A través de un análisis sobre la tecnología como factor generador de valor en la empresa, resaltando el desarrollo de procesos de innovación tecnológica y su adecuada gestión para conseguir y mantener ventajas tecnológicas, que incrementen la competitividad y la posición de dominio de la empresa, destacando las características esenciales de las etapas de desarrollo de nuevos productos por la empresa y las ventajas derivadas de una buena gestión. Es dentro de este marco de análisis, decidí basarme en el libro de la bibliografía básica de PAVON Morote, Julian; Hidalgo Buchera, Antonio (1997): *Gestión e Innovación: Un Enfoque Estratégico*. Ed. Pirámide. España. CERI: 658.5 PAV 1997.

**Palabras clave:** Empresa, tecnología, Innovación, tecnológica, gestión, competitividad, nuevos productos.

### Abstract

This paper aims to analyze the strategic dimension of technological innovation. Through an analysis of technology as a driving factor of value in the company, highlighting the development of technological innovation processes and proper management to achieve and maintain technological advantages, to increase competitiveness and dominance of the

company, highlighting the essential characteristics of the stages of new product development by the company and the benefits of good management.

**Key words:** Business, technology, innovation, technology, management, competition, new products.

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## Introduction

### **The strategic dimension of technological innovation.**

The strategic dimension of technological innovation take care throughout this essay. Therefore I must make some observations about these concepts and how they were addressed during the development of this work.

We must first distinguish between the concepts of business and technology.

For purpose of this test is suggested that for the company, technology is one of the fundamental pillars on which their profitability, growth and competitiveness, becoming an essential factor for perpetuity rests. According to Twiss (1978), one can say that the most important industrial companies owe their origin and survival proper application of technology to developing new products and improving manufacturing processes.

Currently the concept of technology has evolved, not only refers to machinery and equipment, but everything related to information, knowledge and decisions necessary to maintain a competitive company in the long term, it is a modern company based on patterns international. Therefore, the concept of technology transfer is changed, the concept of strategic management of technology, where technology is a strategic element in the decision-making process, to be incorporated as a whole the company.

The technology enables the company to be viable in the market to enable suit, through effective and efficient manufacturing, selected segments of demand. Competitiveness generated by the company depends on a high percentage of the technological level reached

and the refresh rate of the same, which makes them particularly relevant for the company the following technological factors:

Technological collection, containing the technological heritage of the company, the development of endogenous technological skills and proclivity to promote the ability to innovate.

- Ability to capture technology, based on the development of skills and resources geared to the selection and acquisition of technology from the environment and subsequent assimilation, adaptation and dissemination.

### **Technology concept**

Similarly we can cite the author (Child, 1974), which has one of the most precise definitions of technology, which conceptualized as:

"The whole of own knowledge and information of an activity that can be used systematically for design, development, manufacturing and marketing products or providing services, including proper application of the techniques associated with global management."

There are two perspectives to evaluate the technology: the instrumental and economic. The instrumental assessment is to determine if a technology works and gets the desired result. The economic evaluation seeks to determine whether the result was achieved efficiently or caused the greatest possible benefit. In the instrumental assessment considers factors such as operability, reliability, functionality or suitability for use. In the economic assessment considers factors such as the investment required for acquisition or development, the cost of operation and maintenance and, ultimately, the profitability generated for the company.

Technology, from the point of view of business competitiveness can not be considered in isolation but as part of a "technological system" from the base set of related technologies.

Technological systems are classified into hierarchies, which are divided into three main types of technologies. The key technologies, generic technologies and application technologies.

The core technologies that are based on scientific or close to science, such as electronics or semiconductor physics principles.

Generic technologies are often subsets of core technologies that share a common denominator such as the main proceedings in which they are based or the subject matter.

Critical technologies and generic trigger many applications in practical realization eventually grouped according to specific products or markets. So in the case of generic technologies of electronic data processing, applications that result are grouped in branches like computer science, robotics, office automation, etc., they just leading to a series of objects and technical devices by application in its design and production processes derived from generic technologies.

It is necessary for companies to adopt technological surveillance procedures, which allow us to observe and then analyze the movements produced or stagnation, the procedures do become a necessary for any type of policy that the company ultimately taken instrument.

Watching them must bear in mind the principle that each technique, each technology has a potential defined performance just to have a limited lifespan in terms of its usefulness, compared to other alternatives that emerge. This performance is depleted by a number of causes or limitations. These limitations can be classified into the following groups (Rapp, 1981):

Limitations imposed by the structure of the material world, defined by logic and scientific laws.

- Limitations imposed by intellectual resources specified by the state of scientific knowledge and technological know.
- Limitations imposed by the material, specified by its availability in quantity and quality.
- Limitations imposed by social conditions, identified by the legal and political constraints.

From a strategic perspective, Arthur D. Little difference between basic technologies, Emerging and key.

Basic Technology: It is a key technology of the past that is currently available to any company in the sector.

- Emerging Technology: That which is in the first state in their application in industry.
- Key Technology: This technology is supporting the current competitive position of the company that uses it.

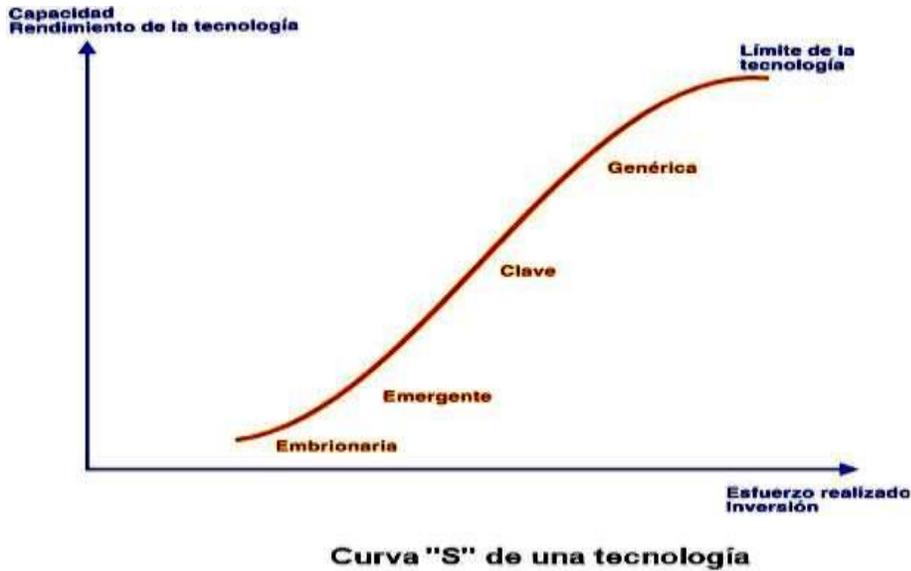
The knowledge of these technologies is of particular interest to the business, when choosing which technologies are required in the strategic plan. This will allow the company to know what technologies are being to her core, which emerging or which keys, which will define priorities in choosing between different technology options Ideally, a competitive firm should perform the following actions:

- Check all key technologies, investing in improvements or obtain a systematic control of them and observe their evolution.
- Meet at least one of the emerging technologies that exist in the sector.
- Reduce support its core technologies selectively.
- Avoid emerging technologies requiring long development periods.

### **The life cycle of the technology.**

Any technology to become subject to a process of evolution over time. In the beginning, only they can access some companies and then you can join any competitor in the market. Therefore, one can say that each technology has a lifecycle. Emergency phase, growth phase and mature phase saturation phase.

The life cycle of a technology, represented by the model of evolution in time of one proposed by Foster (1987) technology is known as "S curve of technology", shown in the following figure.



The curve of figure represents the fact that as the product, the technologies have a source, and a limit growth.

Emergency phase. Period in which it appears and develops incipient technology in question, the technical performance are especially scarce and rarely yields competitive with other technologies that could eventually replace. The development does not just come.

Growth phase. Intense period of improved technology yields clear improvement due to the degree of reliability to be achieved. In this period just decanting the application fields in which it has possibilities, adding new features that could not be reached or were not profitable with existing technologies.

Stage of maturity. Period in which they end up stabilizing technology to define running procedures for possible applications, the high degree of knowledge makes imagine many new applications, while the yield from the technical point of view although it grows, its growth rate as it is much lower.

Saturation phase or aging. Period when technology reaches its limits, manifesting little increase technical performance to be obtained. Research to improve performance rather than provide clear improvements, just to introduce distortions in the procedures end producing increased costs and low productivity assessment.

### **Conceptualization of the process of technological innovation.**

Proper management of technology is one of the keys to business success today. The company uses a technology that can be generated internally by the research activity or acquired abroad.

The complexity and rapid changes make it physically impossible for a company to generate for itself all the technologies you need, while the uptake of generic technologies is extremely difficult without a capacity own research and development in order to maintain competitive position and market dominance.

### **Concept and classification.**

For the company to progress and develop must adapt quickly to the changing technological environment, through the development of technological innovation processes.

What is innovation in business?

To solve a problem and you need the knowledge and experience of the individual to solve

Nelson (1974) defines innovation as a change that requires a considerable degree of imagination; is a relatively sharp break with established ways of doing things and thereby create fundamentally new capability.

When it manages to turn ideas and knowledge into products, processes or services, then we are talking about innovation.

Technological innovations can be classified according to their originality in radical or incremental. Radical innovations refer to fundamentally new applications of a technology, or an original combination of known technologies that lead to entirely new products or processes. On the other hand, incremental innovations are those that relate to improvements made within the existing structure and that do not substantially change the competitive ability of the company long term.

Technological innovation can be product or process:

- The product can be considered as the ability to improve the product itself or the development of new products by incorporating new technological developments that may apply or technological adaptation of existing processes.
- The process involves the introduction of new production processes or the modification of existing by incorporating new technologies.

Its main objective is to reduce costs as well as having a specific impact on the characteristics of the products, is a company response to increased competitive pressure in the markets.

Technological innovations that occur in businesses generate spillover effects to global economies.

When you have an innovative company?

It is said that a company manages to be innovative when it is able to transform scientific and technological advances into new products and processes, through appropriate and effective linking science, technology, production, social needs and requirements of the national and international market.

Characteristics of the innovation process.

What goals does innovation in the company?

First, innovation aims to exploit the opportunities offered by the changes, which forces the generation of an innovative culture that enables the company to be able to adapt to new situations and demands of the market is critical in competing . Second, innovativeness is based on the complexity of the process of technological research and unpredictable nature of the alterations that drive the market and own jurisdiction (Rothwell and Zegveld, 1985).

The process of technological innovation is defined as the set of technical, industrial and commercial steps which lead to the successful launch in the market for new manufactured products, or the commercial use of new technical processes.

A schematic innovation translates into the following facts:

- Renovation and expansion of the range of products and services,
- Renovation and expansion of production processes,
- Changes in the organization and management,
- Changes in workforce skills.

Technological innovation is therefore a process involving several stages to bring to market. Innovation is produced by thermal stresses developed within the company, but with a lot of interaction with both technological and market environment

### **Innovation in new products.**

New product means articles that are new to the firm are those original products or real innovations, major changes implemented in existing products, imitations or reproductions worked by competitors and acquisitions of product lines, for in all these classifications are no incorporate something "new" to the current combination of goods. "New Product" is perceived by most of the public as new in a given market. The degree of novelty depends on established buying patterns. A new product can be created and made "new" in many ways. An entirely new concept can be translated into a new item and / or service. Simple minor changes to an existing product can turn it into another "new" or can offer an existing product to new markets that will consider "new".

Why improve a product?

- Cost reduction.
- Increase reliability
- The extension of the applications.

There are three variables that will affect the degree of innovation of a product: Functions performed, using technology and customer groups to which it is addressed. If each of these variables with an axis, as we move away any of them increases the degree of real novelty of the product is identified.

Ultimately any innovative company that is sure to both sides that define innovation from the point of view of customers is risking fatal error.

### **Development stages**

Why is it important to develop new products?

Product development is important for the consumer, business essential and strategic for the nation.

A product development process is the sequence of steps that a company is covering to conceive, design and market a new product.

Product Development: The set of actions that aim to create new satisfactions and / or updating, changing or upgrading of existing satisfactions, in order to make them available for:

Meeting the needs and desires of consumers.

- Generate income for companies to operate, upgrade and grow.

Creating new products is an interactive process which comprises the following steps:

- Generation and search for new ideas.
- Selection of ideas.
- Economic evaluation.
- Product development and prototyping.
- Test the product on the market.
- Mass Launch.

Generating ideas. It is a systematic search for new products, attending a variety of internal and external sources and through different methods or procedures.

Selection of ideas. The selection process will allow more consistent filtering those ideas with the purposes of the company and consistent with its resources.

Economic evaluation. Consists of calculating costs, sales, profits and rate of future performance of the new product to be marketed and verify compatibility with the objectives of the company.

Product development and prototyping. It should develop a prototype or model which is made at low cost to attract customers. A market survey to find out how to best design the product is also conducted.

Test product on the market. A formal investigation of the product is performed before starting the test market, taking into account the following points:

How many cities or areas considered in the test?

- What cities are taken into account?
- What kind of information should be collected?

Massive release. The product can now be introduced to the market, it is in full production, and the choice of the brand and its presentation are already determined. One factor to consider in this period is the competition that will determine the success and future of the product.

### **Product Lifecycle.**

The product life cycle is the evolution of the sales of a product during the time it remains in the market. The products do not generate maximum sales volume immediately after entering the market, and keep growth indefinitely. The concept of life cycle of a product is a marketing tool. The conditions under which a product is sold change over time; and sales vary and pricing strategies, distribution, promotion, should fit considering the time or phase of the life cycle in which the product is.

The life cycle of a product is classified into four phases.

Introductory phase. It occurs when a new product is introduced into the market. Sales are low because there is not a wide acceptance of the product in the market. Product availability is limited to the buyer.

Growth phase. If the market accepts the product, sales are increasing rapidly. The physical distribution planning is difficult at this stage of growth or acceptance. However, product availability also extends rapidly across geography, to accrue buyer interest in the product. The benefits increase because they know the product or service customers.

Stage of maturity. It is a period where sales growth is slow or has stabilized at a level, in this stage the product is established in the market, which is already considered an old product. It is when the product has reached its highest profitability.

Decline phase. There comes a time when sales slow in most products by changes in technology, competition, or loss of interest by the customer. Often prices fall and profits are reduced. The company can focus its activity on the continuous improvement of production processes, through various innovations and improvements in product quality.

#### **Key in the new product development factors.**

The key to the successful development of new products depends on the approach towards achieving goals. With respect to product development, success depends mainly on three factors: the product, the company ability, benevolence of the market.

Thomas (1996) has identified a daub with lessons from the 24 successful cases of development of new products studied. This list, the priority order is predetermined, is set out below:

- Meet the needs of the consumer. Track market trends.
- Segment the market.
- Harnessing Global Opportunities Product.
- Find strategic partners and relationships to function in a complex business environment.
- Pay attention to the legal and regulatory aspects.
- Choose the philosophy of developing new products best suited to the culture of the company.

- Assess the good leadership and adequate support to supporters product resources.
- Develop functional teams.
- Promote and manage creative resources.
- Granting autonomy to employees relate to customers.
- Carefully evaluate the role of market research.
- Define a clear concept of the essence of the product.
- Develop an optimal product.
- Applying total quality management to new products.
- Striving for innovative design based on principles.
- Consult with the most advanced users of new product ideas.
- Increase the use of information technology in product design.
- Choose a product image that is consistent with its basic concept.
- Investing in the brand and protect it.
- Prepare a suitable communication program to launch the new product.
- Get an adequate presence in the distribution channels for the release date.
- Providing a proper price-value ratio at launch.
- Apply in launching the new product an integrated commercial program.
- To assess the time to hit the market: does disadvantaged first out?
- Persevere in the effective execution of tasks.
- Provide competitive so almost inevitable that attracts a new product that wins.
- Not a good idea to leave prematurely.

- Patience: accelerate product development if possible, but success takes time.
- Follow firmly principles of action.
- Search the success of the process rather than the project.

## Conclusions

For the company, the technology is critical to the profitability, growth and competitiveness. Companies owe their origin and survival to the proper application of technology, developing new products and improving manufacturing processes.

The highly innovative a company is characterized by the implementation of a business development program, which aims to adapt a model of technological innovation to achieve it in a competitive response to technological and economic environment of the turbulent character facing businesses.

If it is intended to develop and grow an existing or new enterprise, innovation alone is not enough, but the conditions are created suitable environment such as adequate financial resources and a close relationship between science and technology led to the introduction of new products or services on the market.

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