

# AN OVERVIEW OF THE GENERAL THEORY OF INNOVATION

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**Summary.** *Many authors define the Innovation as the way to do differently the thing. Some of them considers it as leader genius or manager vision; Others look at it as systemic approach where many factors are in interaction; some researchers in management think that the innovation is a logic process realized in the R&D function; and finally, the innovative action is the result of long process of trying for another group of thinkers. The main idea of this paper is to make clear the meaning of the innovation. Different theories will be considered in our article but also the dimensions of the innovation concept. In general, we tried to provide all the elements that can cover the innovation concept.*

**Keywords:** *Innovation; Systemic approach; Dimensions; Concept.*

Innovation is a concept widely studied in scientific literature. However, it seems that a lot of work can still be doing about it. This is not a new concept, but it is still very difficult to define, because all the studies have different opinion on this subject.

Innovation is a very simple word, but a very complex concept, it refers to many interrogations difficult to answer such as: What is innovation? Is it a process or an event? Who are the innovators? What's the use of innovation? And Innovation, what is it for?

Scientific literature widely speaks about all that questions, but many studies disagree on most of them, that is why it is not easy to answer those questions. However, answering those questions is necessary if someone wants to study this concept. That is why in this paper we will try to give a clear answer to all that questions. However, all the answer here must be considered by the reader as opinion and not as trueness, indeed as we already says, this concept has not a unique definition. The reader, if unsatisfied by the definition given here can report itself to the bibliography and try to find a definition that suit more to him.

In the XXst century, the three industrials revolution of western countries made innovation a key concept of the market. The developing of new technologies, the apparition of consumption society, mass market, reduced the product's life time,

management process and production process. Our society is always changing, and it seems that it is the one who innovate better that will stay alive. The end of cold war definitely installed capitalism in the whole world. Capitalism is a very requiring system, where growth and profit are the two only things a manager has to reach. But capitalism is also the system of free competency. This free competency, associated with growth and profit demand for the companies to be always mutating, looking for something better to do, looking for innovate. Indeed, as Schumpeter said, at the beginning of the XX century, one of innovation's objectives seems to be making profit. Maybe we can say further that to create a competitive advantage is another objective of innovation due to the actual situation of the market.

## I. THEORETICAL APPROACH OF INNOVATION

A review of the literature on innovation and diffusion reveals several distinct schools of thought as to just what an innovation is and why one might happen. The «school» which has been most influential in North-American and North-American influenced development projects is led by Everett Rogers. He defines innovation as «an idea, practice, or object that is perceived as new by an individual or other unit of adoption» (Rogers 1983:11).

**I.1. Rogers school.** To E. Rogers, innovations are singular inventions that are adopted via a process of protagonist «marketing». At issue is the potential adopters behaviour («i.e.» attitudes and personality) – rather than their ability to adopt, and the ability of the agent promoting the innovation to persuade the potential adopter.

**I.2. Barnett school.** In contrast to the Rogers school, H. Barnett (1953), B. Agarwal and others have argued that innovation and diffusion are not separate processes – that innovation is essentially the first step in the diffusion process – and that potential adopters decisions concerning adoption is based on rationality rather than persuasion (Agarwal 1983). In this school, innovations are ideas or technologies which are continually adapted as they are adopted, and represent sequential socio-cultural change. J. Schumpeter's simple definition, that innovations are «the carrying out of new combinations» (1971:47) also fits this contrasting school of thought.

**I.3. Economists.** Economists have focused on the economic factors «inducing» innovation, and have taken a market rather than personal perspective. Ruttan and Hayami (1984), utilize a functionalist, neo-classical argument that innovation results from the endogenous scarcity of some component of production.

The neo-classical school has been criticized by another group of economists that emphasize the importance of exogenous, structural factors (history, international markets, politics and institutions) in «inducing» innovation («e.g.» A. de Janvry 1985).

**I.4. Anthropologist.** The discipline of anthropology is also divided on the subject. Again, in general terms, the division is largely between those who consider humans to be pragmatists with innovations a function of their rational objectives and characterized by the materials at hand, and those who consider humans meaning- and symbol-making beings with innovations a function of their subjectively defined beliefs.

Two anthropologists, H. Barnett and S. Gudeman, offer arguments that bridge this gap between the «induced» argument of the economists and the «culturalist» arguments of some anthropologists. Barnett maintained that the incentives to innovate can be described as: self-wants (including credit

wants and subliminal wants); dependent wants (including convergent, and compensatory wants); or a voluntary desire for change (Barnett 1953). At the personal level, the «induced» innovation model of Ruttan and Hayami would fit within Barnett's model.

Accepting the Barnett's and Schumpeter's definition of innovation – as that of making new combinations of familiar things – S. Gudeman proposes that people create new things for use, and simultaneously create culture (Gudeman 1991). A discarded food bowl used for a chimney cap is thus both an innovation with practical use value and a cultural creation. This proposal is both a refinement and extension of the Barnett model.

Beyond economic and cultural rationales, there are of course «personal» motivations for innovation. By using the term «wants» rather than «needs», Barnett clearly asserts the uniquely personal nature of innovation incentives. Schumpeter notes that these motivations vary from «spiritual ambition... mere snobbery... will to conquer... to prove oneself... to succeed for success itself... [and] finally there is the joy of creating, of getting things done or of simply exercising one's energy and ingenuity». (Schumpeter 1971:69). Gudeman (1991) reminds us that the innovator can be motivated more by pride and excitement than by potential economic gain.

## II. DEFINITION AND DIMENSION OF INNOVATION

**II.1. Definition of Innovation.** As we have just seen, innovation has a lot of definitions. In order to make an interesting paper about innovation, it is very important to choose a definition of innovation before continuing writing about it. We think here that the definition of Porter is the most appropriate one to permit an interesting work on this concept. According to Porter, the innovation – the transformation of knowledge into new products, processes, and services – involves more than just science and technology. It involves discerning and meeting the needs of the customers. This is a very general definition of innovation, where it is considered as a transformation (a process). According to Porter the innovation can lead to a product, a process, or a service, that is to say that innovation is not only a technological pro-

cess but it concerns every new thing proposed by a company. This dimension of innovation service appeared with the transformation of the industrial society in a service society. Indeed, today most of companies are services companies, while in the 50's, the market was essentially product oriented. We think that this new dimension of innovation will be more and more important in the XXIst century. Porter says that innovation involves more than science and technology, it involves discerning and meeting the needs of the customers. To Porter the customer is the key component of innovation. He doesn't say that innovation should always be in a pull market but he underlines that, there is no use innovating to innovate, when someone makes an innovation, he should always think about the customers, what are its needs? That is to say that to Porter, innovation aim at satisfying the customer, he sees innovation as a tool to improve company-clients relation. To Porter, innovation must be market oriented. Saying that, Porter disproves the idea of Schumpeter and Gudeman according to which innovators can be motivated more by pride and excitement than by potential economic gain.

**II.2. Dimension of Innovation.** Innovation comes in many forms (Gopalakrishnan and Damanpour, 1992; Utterback, 1994). For some the invention of the now famous Post-it Note® that began as a bookmark for a 3M engineer is the quintessential innovation. Others in the household wood furniture industry identify the application of electrostatic finishing to wood as a textbook innovation. MIS professors see the use of Internet technologies for data gathering, literature review and classroom instruction as a fundamental innovation.

It is relevant to study the different dimensions of innovation because scientific literature highlights the fact that there is a narrow relationship between organizational structure characteristic and type of innovation (Daft, 1978; Damanpour, 1991). In other words, the propensity for a firm to adopt innovation is not constant across all innovations. According to J.R Cooper the two main explanation of such a relationship involves strategy and power.

Indeed, if a company wants to develop a competitive advantage or to make profit in a long term

objective, it has to adapt its organizational structure to a strategy. In other terms, it must adapt its structure to facilitate the adoption of an innovation that can lead to economic growth. Porter (1980) argued that a key aspect of realizing a low cost business strategy rests with the firm's ability to reduce costs through process innovation, while a differentiation strategy depends on the firm's ability to generate totally new product ideas or new combinations of features in existing products.

A second reason innovation type may vary with organizational structure relates to relative power within the organization. Innovation type in a general sense is related to the professional orientation of the innovator that is why company leaded by people of one orientation are going to adopt more easily one type of innovation. The most known dimensions of an innovation are the following: Administrative, technological, Incremental, Radical, Product, Process.

We have just seen that innovation has many dimensions and vary with organizational structure. By studying adoption of innovation, we will highlight the relation between innovation and different type of variables.

### III. ADOPTION OF INNOVATION

**III.1. Administrative and technological Innovation.** As we just say, innovation has several dimensions: incremental, radical, product, process; technological, administrative. However, we are not going to study each dimensions, because most of those dimensions have things in common. For instance, an incremental innovation can be technological or administrative. A technological innovation can be a product or a process. That's why, in order to simplify the study, we are going to consider only technological and administrative innovation because we think that all dimensions quoted above can be contained in those two types of innovation. Before continuing we must define those two innovations:

Administrative innovations include changes that affect the policies, allocation of resources, and other factors associated with the social structure of the organization and originate with professional managers.

Technological innovations represent adoption of an idea that directly influences the basic

output processes of the firm (Daft, 1978). It can be considered here as innovation on the product commercialized by a company. Innovations of services are part of technological innovation.

We said in II.2 that type of innovation is liked with organizational structure of a company that is why; we are going to study separately, technological and administrative innovation.

### III.2. Adoption decision

Before commercializing a technological innovation, or implementing an administrative innovation, it is very important to pass the decision adoption stage with success. Indeed, the decision to adopt an innovation or not for a company is very important in its success. Several factors should be taken into consideration while deciding to adopt an innovation in a company. First, the managers (the one who takes the decision) has to consider the innovation attributes and sees if those attributes can match with organizational characteristics. He should define 5 key attributes of the innovation which are the following:

Relative advantage, Complexity, Triability, Observability and Investment requirement. Then, the manager has to see if all the attributes are compatible with organizational needs, organizational structure, member attitude toward technology and decision making practice. If the manager decides to adopt an innovation without taking this into consideration, the innovation will fail more easily, that it is to say that there will be more risk for the innovation to be part adopted, over adopted or even non adopted.

### III.3. Adoption of technological Innovation.

The adopters of technological innovation are the customers of a market. Rogers developed a theory of adoption in which he considers the following 5 categories of innovation adopters:

- innovators (3 %);
- early adopters (14 %);
- early majority (34 %);
- late majority (34 %);
- laggards (16 %).

Innovators tend to be experimentalists and «techies» interested in technology itself; early adopters may be technically sophisticated and interested in technology for solving professional and academic problems; early majority are pragmatists and constitute the first part of the main-

stream; late majority are less comfortable with technology and are the skeptical second half of the mainstream; laggards may never adopt technology and may be antagonistic and critical of its use by others. While putting a new product on the market each company tries to target early adopters for two reasons: first because they represent 34 % of the customers, and second because they will allow facilitating the adoption by the late majority. Indeed, this last category is skeptical, and needs other people to have adopted this new product before adopting it. We will see in the last part of this paper how a company can optimize the adoption of a new product.

**III.4. Adoption of administrative adoption.** Administrative innovations are not adopted by customers; it is innovation that affects social structure of a company, within a company. It has to be adopted by the workers of the company, and not by customers. Moreover, this type of innovation is more often imposed by the manager to the workers, contrary to technological innovation where adoption results of a choice of a customer. That is why the adoption process is totally different. In order to optimize the implementation of an administrative innovation, it is very important to avoid unilateral decision and to involve every person which is going to be concern by the new innovation in the company. Communication and thus diffusion are key principles for a good adoption of administrative innovation. We will see that point while studying innovation diffusion.

**III.5. Adoption innovations variables.** As we just said, innovation adoption depends on several factors. According to Kimberley and Evanenko, these factors can be classified in 3 categories: individual, organizational and contextual. They made a study in 1981 of the adoption of administrative and technological innovation in many hospitals and the result was that both innovations depend on variables contextual, organizational and individuals. Adoption of the two different type of innovation is not influenced by identical set of variables. For instance organizational variables, size in particular are better predictors of administrative innovation than individuals or contextual variables. The level of competition, the external environment, and the size of the city that host the company are part of contextual variables. Spe-

cialization, size, internal organization, external organization, are part of organizational variables, and manager's work-time, education and involvement in the company are part of individual variables. Thus, those variables can help a manager to foresee if the innovation he wants to implement is going to be adopted or not. A study of the three levels of the company allows anticipating innovation adoption result.

Adoption of innovation is very linked to diffusion process of innovation. Indeed, an innovation can be adopted only if one can use efficient channels of communication to diffuse innovation. Adoption and diffusion are frequently seen as different process. A lot of authors highlight the fact that diffusion is the stage that follows adoption in the implementation process of an innovation. We disagree here considering that those two stages are strongly linked; diffusion is here a tool for adoption and thus a tool for the success of an innovation.

#### IV. DIFFUSION OF INNOVATION

There is three ways to diffuse an innovation: by using collective or individual actors, or communication channels or the economic context. We are going in this part to consider separately administrative and technological innovation; because it seems that the process of diffusion differs according both type of innovation.

##### IV.1. Diffusion of technological Innovation.

There is two type of technological innovation. The one which answer a need of the customer (pull market) and the one which anticipate a need (push market).

**1.1. Diffusion of technological Innovation in a pull market.** This is the easiest situation for diffusing an innovation. Indeed, customers are in this case ready to accept an innovation, because they need it, and are waiting for it. The company has to adapt precisely its mix marketing to the target that needs the innovation. The target should be early adopters, that is to say people who are ready to adopt an innovation. For example, laptop can be considered as a pull innovation. Indeed business man became very dependent of their personal computers; they needed to have a portable one. This innovation was answering a need of customers; the first laptop users (business man) were ready to adopt the innovation, the mix mar-

keting was well adapted (good communications, high prices...), then the products was adapted for personal use and the mix was changed.

**1.2. Diffusion of technological Innovation in a push market.** People are more and more reticent for innovation nowadays. In the 90's every thing was said to be new, innovation was a very used term to help selling product. It results that the customers began abused and more and more on his guard. Nowadays implementing an innovation in a push market is more and more difficult. First the product must have a good value. Indeed in the 90's everything could be sold thanks to the technological attract, but now customers want useful thing, the technological effect is not as important. In France, in 2001, 78 % of the customers thought that there was too much innovation. Second, the technological advantage must be shown very easily because of the reticence of customers towards useless innovation. Then an effort of communication must be done, towards the customers but also towards the sellers who have to explain the innovation in the simplest way to do it. The seller has to help the customers to trust in the product. The formation is something very important in such a business.

**IV.2. Diffusion of Administrative Innovation.** The diffusion of administrative innovation is a complex but determinant process in its success. Administrative innovation should not be imposed by the top management to its workers; each worker must be implicated and consulted before deciding of the implementation of an innovation. If this work is well done, the diffusion will be very easy. There are two steps in the diffusion of an administrative innovation: first, workers have to be informed of the innovation by internal communication channel (journal, speech of the managers, meeting...) and then, the management has to provide a good formation. If the innovation is a new software, people must be well formed on the software so that they can realize quickly the interest of using it. If the innovation is a new organization, people must be formed quickly to their new work. Formation is a key procedure in the diffusion of administrative innovation. For administrative innovation, diffusion process and decision of adoption are very similar.

## V. THE INNOVATION SUCCESS

To be successful, an innovation must be well adopted and well diffused. The wisdom would be for an innovation to create a competitive advantage, to win market share quickly increasing profit. Moreover it is said that administrative innovation aims at improving process, but we think here that such an innovation aims at improving the process to improve the productivity or the product, that is to say, to increase profit or win market share.

Nowadays, managers have to always renovate products, and deal with new products. However in order to maximize the success of an innovation, managers have to choose the right innovation at the right moment at the right place. This is all the difficulty of corporate job; they have to choose on what they must work to develop something better than exist on the market. For instance an automobile constructor has to choose on what product it has to renovate at a certain time. In order to help managers answering that question, Rogers developed the 5 important conditions for an innovation being a success:

- to have a competitive advantage easily perceived by the customers;
- to be compatible with actual way of life;
- to be easy to trial;
- to be well available on the market;
- to have a complex technology but accessible for the customer.

Indeed, when a company wonder which product it has to renovate or what innovation should be done, it has to check each of this 5 points and see which project respect all of these factors.

Innovation is not a new concept, but the XXst century created new signification to it. Indeed, before considering innovation in the market perspective, it was a concept very simple used by everybody which consist on creating new thing. Nowadays, it began a product, process or service that involves discerning and meeting customers' needs. Most of innovation are aborted rapidly or failed when they are adopted. To impose an innovation to the market is something very difficult, due to the complexity of the concept and all the people and process that it involves. Innovation seems to be the only way for the company to stay alive, but majority of innovation are failing. That

is the paradox that expresses the high difficulty of performing in the market. This paper tried to explain the process of innovation in order to the reader understand how an innovation is working, what or who is involved in the process of implementation of an innovation. Adoption and diffusion are the two stages for the implementing of an innovation. Many people and variables are involved in those two stages; all of those must be taken into consideration by the manager when he decided to try implementing a new innovation. The innovator must be very pragmatic and must forget their own enthusiasm for considering rational variables. Moreover, as we just said, innovation depends on several factors, some of which are external factors and so uncontrollable. That is why, there is no method to follow to implement successfully an innovation, and there is just a way to follow to maximize chance of success.

## LITERATURE

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**Ясір Джамал** (Харківський національний університет економіки). **Огляд загальної теорії інновацій.**

**Анотація.** У статті розглянуто різні теорії та концепції інновацій. Розкрито сутність і значення інновацій у сучасному світі та їх вплив на розвиток економіки.

**Ключові слова:** інновації, системний підхід, розміри, концепція.

**Ясир Джамал** (Харьковский национальный университет экономики). **Обзор общей теории инноваций.**

**Аннотация.** В статье рассмотрены различные теории и концепции инноваций в современном мире и их влияние на развитие экономики.

**Ключевые слова:** инновации, системный подход, размеры, понятие.