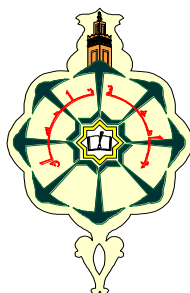


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Faculty of Economics, Mangement and Trade Sciences



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**THE ROLE OF MARKETING IN INITIATING AND ENHANCING
INNOVATION WITHIN ALGERIAN FIRMS
(AN EXPLORATORY STUDY)**

Student:METAÏCHE Mohammed El Amine

Supervisor:Professor BENHABIB Abderrezak

JURY:

Pr. DERBAL Abdelkader	University of Oran	President
Pr. BENHABIB Abderrezak	University of Tlemcen	Supervisor
Pr. BENBOUZIANE Mohammed	University of Tlemcen	Examiner
Dr. MALIKI Samir B.E	University of Tlemcen	Examiner

Academic Year : 2010-2011

This work is dedicated to my Mother, and my
Father.

إلى والدي الغالية و إلى والدي رحمه الله..

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Introductory Chapter:

Drucker and Maciariello (2008)¹ say that “*There is only one valid definition of business purpose: to create a customer.*”[...] And, “*Because the purpose of business is to create a customer, the business enterprise has two – and only two basic functions: marketing and Innovation. Marketing and Innovation produce results; all the rest are costs [...]*”From this short statement we started our research path investigating the importance and the relationship between marketing and Innovation, in an effort to analyse the innovation activity of Algerian firms, and to weight up the Innovation obstacles, in ways that allow us knowing how to help the local economic actors enhancing innovation within the business sector. We attempt also to measure the Algerian National Innovation System (NIS), through comparing it with some countries’ NISs, just like those of Tunisia and Morocco, using data and statistics gathered from different sources such as the UNESCO Institute for Statistics, the World Bank, and some others...

We, in fact, have taken this subject for our masters’ thesis, obviously because Algerian firms are supposed not to be innovative at all, and according to the importance related to firms’ innovativeness and creativity and its huge impact on the whole economic performance and success, we have tried to highlight the levels of innovation of Algerian firms and to identify the problems and obstacles that slow down innovation. So that we tried at first to check out the innovativeness of Algerian firms, and then we have to talk about what drives Innovation; and especially that mainly firms managers, employees and even economists do not really recognize the Innovation drivers and how a simple firm can be innovative; Then we had to answer the following question:

- ❖ *What are the obstacles for Algerian firms to be innovative?*

This general question yields three principal questions on which we built our research;

- ❖ *What is Algerian Firms’ degree of innovativeness?*
- ❖ *What are the barriers and the upholders of Algerian firms to be innovative?*
- ❖ *What is the degree of marketing influence on Innovation process within Algerian Firms?*

¹ Drucker, P. F. & J. A. Maciariello. (2008). “Management”: revised edition. NY: Harper Collins. p 30. Noticed in “Joseph Maciariello, (2008) “Marketing and Innovation in the Drucker Management System”, Journal of the Academy of Marketing Science; CA, USA.”

Hypotheses:

In an attempt to understand the degree of innovation within Algerian firms, as well as to be aware of the barriers to Innovation within the Algerian market, and to see the linkages and cooperation either intra or inter-firms between Marketing, production and R&D departments in order to check out the roles played by Marketing to enhance innovation and the competitiveness of firms; we give two main hypotheses from which the paths will be planned to illustrate and analyze our subject.

H1: Innovation: Algerian firms do not innovate: obviously Algerian firms are not innovative at all, but empirically; studies have shown that there exists some Innovations within the Algerian market, but firms do not innovate very often and that is because of several reasons, named Innovation drivers, upholders; and barriers to Innovation which we are going to illustrate with more details in this work.

H2: Marketing: Interdepartmental Integration of Marketing department with the other departments creates a synergy that helps enhancing and fostering the innovation activities and innovative performance of firms.

To validate or invalidate these hypotheses we take our First Chapter named “Innovation a theoretical Background” to talk about Innovation first of all from a theoretical background, through exploring the links found in the economic literature between Innovation and other concepts just like economic growth, firm size, creativity, competitiveness and market structure; we explore the literature review of Innovation through highlighting the Innovation concept so that we will identify it, we illustrate in the same chapter the sources and models of Innovation, and the diffusion of Innovation where we will talk about the S-curve to show how Innovations are diffused.

Besides, in the second chapter which is called “Marketing and its use in Innovation activities “ we talk about Marketing and some interesting aspects for our research because we think that we cannot talk about Marketing and its links with Innovation without emphasizing on a number of concepts including products and production, consumers, consumer buyer behavior, product lifecycle (PLC), customer experience cycle, customer satisfaction, marketing barriers to Innovation, Marketing and R&D linkage during NPD projects, new product marketing, Innovation marketing, and some other economic concepts. While in our third chapter which is dedicated to highlight the empirical study of this work we rely on a couple of studies which are

1) investigating National Innovation Systems (NIS) in Algeria, and using an international comparison of NISs between different countries, we discuss the role and impacts of R&D and Innovation on the economic performance of countries, 2) making an empirical study on the innovation capabilities and levels of some Algerian industrial firms through using a questionnaire structured on our data needed, data were gathered with surveillance and help of some local and national organizations such as: the Chamber Of Commerce And Of Industry (La Tafna) of Tlemcen, the direction Of Small And Middle-Size Enterprises, The National Institute Of Industrial Property (INAPI). Our questionnaire was directed also by a web designs company named F-kar web designs located in Tlemcen also and which helped making the E-form of our questionnaire and uploading it onto their web site in order to facilitate the data collection and to help the respondents filling the questionnaire. Our empirical study includes 56 industrial firms, which are mainly located in the western region of Algeria, we use the Logistic regression to test and analyse our findings, so that we introduced two Logistic models to test our hypotheses. We take the Logit model because we divided our sample to those firms which do innovate and those which do not, we take a variable named INNO which is a dichotomous qualitative variable and which takes the value 1 if the firm has already undertaken process or product Innovation within the Algerian market and the value 0 otherwise, However; as to take INNO as the dependent variable for the econometric purpose, and because this variable is a dichotomous qualitative variable we utilize the binomial logit model due to its Binomial qualitative nature, and moreover for the reason that the logistic regression is useful in case the endogenous variable is dichotomous whereas the exogenous variables are either qualitative or quantitative. Consequently, the logistic regression allows us to estimate Innovation propensity of the firm as a function of its R&D expenditures, its R&D intensity, its Cooperation with other firms and organizations, its Marketing efforts, its Size as well as moderator variables.

Another variable named RD is a dichotomous qualitative variable also which takes the value 1 if the firm has R&D activities and takes the value 0 otherwise, In case the firm has R&D activity we define another variable RDI as R&D intensity which means the share of R&D costs in the total of expenditures dedicated to Innovation, RDI is codified over an ordinal scale of 0-4, but as we have seen from our survey, almost all Algerian firms do not have R&D departments, and then both R&D and Innovation activities are included in other activities such as production. So that we have taken RDI through asking the managers about it, in our questionnaire but it does not rely on numbers or fact but only on the respondent's view point, which may be wrong. Algerian firms seem to have a very little rates of R&D expenditures so that the proportion of the

turnover to Innovation activities is very low, from our study we found that Algerian Firms' expenditures of Innovation includes the cost of employees' training, product improvements and patents acquisition... We take other descriptive variables including the variable SIZE which is a multinomial variable to measure the size of the firms and is codified over an ordinal scale also of 1 to 5. MKGI (Marketing Intensity) is a variable that measures the expenditures on marketing activities as a proportion of the firm's turnover and it is codified over an ordinal scale ranged from 0-4; where 0 for the lowest expenditures proportion and 4 for the highest proportion. COO is the cooperation made by the firm with other economic, organizational and social actors including universities, research centres, Labs, both local and foreign firms and institutions... this variable (COO) is codified over an ordinal scale of 0-4 to measure the average of cooperation between the firms questioned and the other organization through having in mind the number of the firm's partners, where 0 for the lowest rates of Cooperation between the firm questioned and other firms and organizations, and 4 is for the highest rates of cooperation. MAR is the variable which measures the degree at which the Marketing function and activities are integrated into other departments and especially during new product development stages, and it is codified over an ordinal scale ranged from 0-4; where 0 for the lowest rates of integration between Marketing and other departments and functions within the same firm, and 5 for the highest rates of integration. QI is a variable that measures the skilled employees intensity and is calculated on the basis of the proportion of qualified and high qualified employees including managers and high qualified personnel in the administrative, technical and R&D departments... over the Total number of the firm's employees. This variable (QI) is codified over an ordinal scale ranged from 0-4; where 0 for the lowest skilled proportion and 4 for the highest proportion. OBLEV is a variable that measures the level of obstacles which face the firm to be innovative, this variable is codified over an ordinal scale ranged from 0-4; where 0 for the lowest levels of Innovation obstacles, and 5 for the highest levels of obstacles, but we must add here that it is sometimes due to the sector in which the firm performs, because in some sectors there are more Innovation obstacles than in others.

While the sample seems to be limited and little to generalize our findings, but at least it has been a serious work in this domain, like that we will be able to include other firms to our sample in ways that help us getting better results, we will use some descriptive statistical tools to test our findings and analyse our data, in order to include the right variables to each model of our binary logistic models given in this research.

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V. Sources and factors of innovation

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Introduction:

The potential and capacity of firms for Innovation does not only depend on technological and financial resources. Innovation requires expert know-how in a lot of areas such as management, production, the Innovation process, intellectual property rights, marketing, and cooperation skills and so on. Understanding and managing different parts of the process is essential for enhancing the development of Innovation activity within firms. The public sector, however, supports Innovation activity in many ways, but the capacity for success in Innovation depends on the enterprise itself. In order to make a good research we have at first know everything about the concepts which are related to our research topic, however; to get into our first chapter into which we will highlight the Innovation concept we have at first to identify it, and then we will give a literature review of Innovation through give a little presentation for what we know about Innovation, the relationship between Innovation and economic growth, creativity, and competitiveness; we will illustrate also the sources and models of Innovation, and the diffusion of Innovation where we will talk about the S-curve to show how Innovations are diffused.

I. Innovation: a conceptual background

In this first part; we are aiming to give a little literature review for innovation in ways that help us defining and explaining innovation as well as to introduce the models and types; so that; we divided this part into six sub-titles which are: 1. Definition of innovation; 2. Incremental Innovation and Radical Innovation; 3. Models of Innovation; 4. Innovation Diffusion and product life cycle; 5. New Product Development (NPD) models: Theoretical perspectives; and 6. Innovation Types.

I.1. Definition of Innovation

"Let's consider a world without airplanes, automobiles, telecommunications, televisions, refrigerators, telephones, internet, agriculture ...where would we be without essential stuff for our lives such as alphabet, languages, printing etc? Maybe you would not read this paper which you are reading right now, and I of course would not be able even to write a word in it. Without Innovation our world would look very, very different"¹, hence Innovation is as old as mankind itself, there seems to be something naturally human to thing about new and better ways of doing things and try them out in practice. In spite of its clear significance, Innovation has not always got the scholarly attention it deserves, except in the recent few years nevertheless some authors have been interested in Innovation processes : from the viewpoints of economic growth, changes and progress² (Schumpeter 1939; Schmookler 1966; Freeman 1990; Kline & Rosenberg 1986; Dosi 1982; Amendola & Gaffard 1988, etc.), of social and organizational changes (Rothwell, 1994; Chandler 1990; Callon, 1994, etc.), or from the sociological and managerial viewpoint (Crozier & Friedberg 1977; Mintzberg 1982; Akrich, Callon & Latour 1988; Alter 2000, etc.). Theoretical origins of the Innovation process show nevertheless a dual permanent feature. First, it is an integral part of the goods launched on the market, and thus, implicitly, of their success or failure with customers. Then, chronologically, the process is always the same: conception, development and diffusion.

Most authors, economists and theoreticians in the field of Innovation have generally accepted that Innovation is a key condition for economic success (Hamel, Gary & Gary Getz 2004³; Audretsch et al 2000⁴; and Dixon, Donald 2000⁵). It has also been argued that the most remarkable examples of growth have been based on 'upsetting Innovation's platform⁶. (Christensen et al 2002).

¹ Fagerberg, Jan. 2004. "Innovation: A Guide to the Literature". in Fagerberg, Jan, David C. Mowery and Richard R. Nelson. The Oxford Handbook of Innovations. Oxford University Press. pp. 1–26.

² www.wikipedia.com, July 2009.

³ Hamel, Gary & Gary Getz. 2004. Funding Growth in an Age of Austerity. Harvard Business Review, 82(7, 8): 76;

⁴ Audretsch, David B. 2004. SUSTAINING INNOVATION AND GROWTH: PUBLIC POLICY SUPPORT FOR ENTREPRENEURSHIP. Industry and Innovation, 11(3): 167;

⁵ Dixon, Donald F. 2000. Schumpeter--fifty years later. Journal of Macro marketing, 20(1): 82).

⁶ Christensen, Clayton M, Mark W Johnson, & Darrell K Rigby. 2002. Foundations for growth: How to identify and build disruptive new businesses. MIT Sloan Management Review, 43(3): 22

While much has been written on the role of Innovation on economic growth, including the influential work of **Schumpeter** from the 1930's, only lately has there been a compelling folder made to argue that external environmental factors are at least as important as internal factors in motivating Innovation. In particular some location based advantages such as characterized by elements such as privileged access to information and institutions, the local economic, social, technological and political factors, and moreover the ability of acceptance in the local market by consumers¹ (Porter, Michael E. and Stern, Scott 2001), mainly because there seems to be found a kind of strong effect of consumer desires and needs on the innovativeness of firms -whether in processes or products-; in the other hand not every Innovation is a success for the firm, because Innovations need to be sold in order to generate added value for the firm and its stakeholder nevertheless Marketing activities have responded to the increasing diversity found in consumer needs, designs and longings with the concepts of consumer satisfaction, market segmentation and product lines which happen to be ones of the most predominant issues in Marketing² (Hans Ruck, Marcus Mende 2009) then firms, however try their best using all their existed resources to fulfill their clients' needs; because in so doing they can give a certain value of their Innovations through selling them to those clients; in the other hand there is the effect of Innovations which had been introduced or created by some firms on the consumers needs via changing those needs and sometimes even through creating new needs such as what had been done in so many fields; largely in the high-tech one. **Schumpeter** declared that *"Changes, including unexpected results and ongoing processes of creative destruction, create a need for systematic Innovation of products, processes and management practices"* (Schumpeter 1942). He also defines Innovation as *the process and outcome of creating something new*", which is also of value. **Michel Porter** identifies it as *"new way of doing things, which is commercialized. The process of Innovation cannot be separated from a firm's strategic and competitive context..."*

A suitable definition of Innovation from an organizational perspective was given by **Luecke** and **Katz** (2003), who said: *"Innovation is generally understood as the successful introduction of a new thing or method, Innovation is the embodiment, combination, or synthesis of knowledge in original, relevant, valued new products, processes, or services"*³. **Amabile et al** (1996) propose another definition of Innovation through saying that: *"We define Innovation as the successful implementation of creative ideas within an organization. In this view, creativity by individuals and teams is a starting point for Innovation; the first is necessary but not sufficient condition for the second"*⁴.

¹ Porter, Michael E. and Stern, Scott. 2001 "Innovation: Location Matters." MIT Sloan Management Review 42 (4), 28-36.

² Hans Ruck, Marcus Mende, (2009), Innovations in market segmentation and customer data analysis, Innovation journal.

³ Luecke, Richard; Ralph Katz (2003). Managing Creativity and Innovation. Boston, MA: Harvard Business School Press. ISBN 1-59139-112-1; Cited in www.wikipedia.com.October 2009

⁴ www.wikipedia.com. July 2009

“An important dissimilarity is made between invention and Innovation. Economists identify Invention as the first occurrence of an idea for a new product or process while Innovation is the first commercialization of the idea. Sometimes invention and Innovation are closely linked, to the extent that it is hard to make a distinction one from another (biotechnology for instance). Innovation is more complex than just invention. Invention involves the conversion of new knowledge into a new product or process. Innovation adds the critical extra step of putting this new product or process into use, in the private sector typically via the marketplace and in the public sector through service delivery.”¹

In many cases, however, there is a substantial time delay between the two, in fact a lag of several decades or more is not uncommon”² (Rogers 1995). And while invention can be done anywhere such as in universities, laboratories, institutions and so on, Innovations occur mainly in firms in the commercial sphere. Thereby, “in order to turn an invention into an Innovation a firm must combine so many types of resources, knowledge, skills and capabilities for instance the firm may need production skills, knowledge and resources, market knowledge, sufficient financial support and so on. Hence, the role of innovator may be quite different from that of the inventor. Innovation involves the whole process from opportunity identification, ideation or invention to development, prototyping, production marketing and sales, while entrepreneurship only needs to involve commercialization”³. Then Management must practice the abovementioned process of systematic abandonment in order to create new resources to fund innovative projects.

“Innovation is a new way of doing something or new stuff that is made useful”⁴, it may refer to incremental and emergent or radical and revolutionary changes in thinking, products, or processes, anyway; something new must be significantly different to be innovative in economics for example the change must increase value such as customer value, product or producer values. Economic literature in this topic shows that the goal of Innovation is positive change, in ways that benefit the organization, its stakeholders and its customers or final users, and it shows that Innovation leading to increased productivity is the fundamental source of increasing wealth in an economy. Nevertheless, for the reason of intangibility of the services some confusion surrounds the concept of product Innovation in services, particularly what constitutes a new service, almost all of economic literature often assumes that they are by definition processes, and while Innovation usually adds value, Innovation may also have negative effects as new developments clear away or change old organizational forms and practices mainly because every Innovation include risks.

¹ P. Trott, Innovation Management and New Product Development, 3rd edition, FT/Prentice Hall, 2005.

² Rogers, E. (1995). Diffusion of Innovations 4th.ed., New York: The Free Press

³ Schumpeter, J. A. (1942). Capitalism, Socialism and Democracy. New York: Harper and Row. Cited in www.wikipedia.com, june 2008.

⁴ Barras, R. (1984). "Towards a theory of Innovation in services". Research Policy 15, Technical Change Centre: 114 Cromwell Road London, U.K, 73.

Innovation has been studied in a variety of contexts such as technology, economic growth, business models, commerce, social systems, economic development, education, and policy construction. There are, therefore, naturally a wide range of concepts to conceptualizing Innovation in the scholarly literature¹.

According to **Schumpeter** Innovations may be classified according to “type”; he distinguished between five different types; new products, new methods of production, new sources of supply, exploitation of new markets and new ways to organize business. Though, in economics the focus generally has been on the two first of these types of Innovation. Moreover, **Schmookler** (1966; p166) in his classic work on “*Invention and Economic Growth*”, disputed that “*the distinction between “product technology” and “production technology” was critical for our perceptive of Innovation*”. He also defined the previous type as knowledge about how to produce or improve products, and the latter as knowledge about how to produce them. Correspondingly, the terms “process Innovation” and “product Innovation” have been used to describe the occurrence of new or enhanced goods/services, and advances in the ways to produce these, respectively.² The disagreement for focusing principally on the difference between product and process Innovation frequently rests on the assumption that the economic and social impact may differ; for instance, while the introduction of new products is commonly assumed to have a clear positive effect on growth of income and employment, it has been argued that process Innovation, due to its cost-cutting nature, may have more a more uncertain effect³(Edquist et al 2001). However, while obviously distinguishable at the point of the individual firm or industry, such differences tend to become extra unclear at the level of the overall economy, because the product of one firm or industry or even a country may end up as being used to produce goods or services in another.

Edquist et al. (2001) have focused on product-and process Innovations, but they did not ignore other important aspects of Innovation, then they have also suggested dividing the category of process Innovation into “technological process Innovations” and “organizational process Innovations”, the former related to new types of machinery, and the latter to new ways to organize work.⁴ However, organizational Innovations are not limited to new ways to organize the process of production within a given firm. Organizational Innovation, in the sense used by **Schumpeter**⁵, also integrated actions across firms such as reorganization of entire industries.

¹ Fagerberg, Jan. 2004. "Innovation: A Guide to the Literature". Centre for Technology, Innovation and Culture, University of Oslo.

² Schmookler, J. (1966) *Invention and Economic Growth*, Cambridge, Mass: Harvard University Press

³ Edquist, C., L. Hommen, and M. McKelvey (2001) *Innovation and Employment, Process versus Product Innovation*, Cheltenham: Elgar

⁴ Idem.

⁵ Schumpeter, J. (1934) *The Theory of Economic Development*, Cambridge, Mass: Harvard University Press, p 66.

Boston Consulting Group took into account two types of Innovation outputs in order to simplify its definition of Innovation; those two types are the *tangible* and the *intangible outcomes*.

“Tangible outcomes can be cited as new products, knowledge, formulas, design, and expertise that are easily quantified and can be legally protected through patents or other intellectual property vehicle”.

“Intangible outcomes like new processes or ways of doing business that lead to a competitive advantage such as a new companywide production process that results in higher quality and greater productivity”.

This type of Innovation outputs cannot be easily quantified itself but it can have a huge impact on quantified results and outcomes just like the company’s business performance, the overall creativity and success of the firm, and by the way, they generally cannot be legally protected.¹

Anyway what makes ‘Innovation’ an attractive research topic is that in spite of the significant research and analysis on this topic, we still have so much to learn in this area. Although both the academic and business literature abounds with studies of Innovation, there is no clear, universal agreement of the precise definition of Innovation. Nevertheless, Innovation is widely viewed as the core component of a healthy organization and a primary source of competitive advantage which promotes wealth creation (Christensen, Johnson, & Rigby, 2002²; Calantone, Cavusgil, & Zhao, 2002³).thereby what is interesting is that everyone can recognize Innovation when they see it. Innovation must involve a creative thought process, it must be unique, and it must generate observable, measurable value.

Arguably, one of the more cogent definitions of Innovation is to be found in **Theodore Levitt’s** work. According to **Levitt**, *“To be innovative, an idea must be creative and it must be implemented”*⁴(Levitt, 2002). Nevertheless; particular emphasis was placed on **Hamel’s** ‘*Design Rules for Innovation*’ and **Drucker’s** comments on industry and market changes, demographic changes, and changes in perception^{5 67} (Hamel, 2000; Sutton, 2001; Drucker, 2002). This emphasis was balanced with consideration for the external environment, including factors such as preferential access to information and information flows (Porter & Stern, 2001).

The literature suggests a number of definitions of Innovation, each enlightening important features and aspects of it. Several writers emphasize newness, including anything different for

¹ Andrew J.P, Derocco E.S, Taylor A. 2009,“the Innovation imperative in manufacturing, how United States can resorte its edge”. Boston consulting Group, Boston Massachusetts, US.

² Christensen, Clayton M, Mark W Johnson, & Darrell K Rigby. 2002. Foundations for growth: How to identify and build disruptive new businesses. MIT Sloan Management Review, 43(3): 22.

³ Calantone, Roger J, S Tamer Cavusgil, & Yushan Zhao. 2002. Learning orientation, firm Innovation capability, and firm performance. Industrial Marketing Management, 31(6): 515.

⁴ Levitt, Theodore. 2002. “Creativity Is Not Enough”. Harvard Business Review 80 (8) 137-144.

Miles, R.E., and Snow, C.C. 1978. Organizational Strategy, Structure and Process. New York, NY. McGraw-Hill.

⁵ Hamel, Gary. 2000. Leading the Revolution. Boston. MA. HBS Press.

⁶ Sutton, Robert L., 2001. Weird Ideas That Work, 11 ½ Practices for Promoting, Managing and Sustaining Innovation. New York, NY. Free Press.

⁷ The Innovation Journal: The Public Sector Innovation Journal, Volume 11(2), article 21.

each organization into which it is introduced ¹(Downs and Mohr, 1976), or as the generation, acceptance, and implementation of new ideas, processes, products in an applied setting or everything perceived to be new by the people doing it. Other authors such as **Rogers** see it as *early adoption of a new idea*², others as synonymous with creativity - *“the process by which one utilizes creative ability; progressiveness or imagination; and the ability to transcend traditional ideas, rules, patterns, relationships, or the like, and to create meaningful new ideas, forms, methods, interpretations, etc.”* as **The Random House Webster's dictionary** puts it - still others as the same thing as improvements, and a final group as substantive but not revolutionary changes; Rogers defines Innovation in general as *“any idea perceived as new by a person or system”*³ (Rogers, E.M. 1992). **Bingham** also accepts the definition of Innovation as *“the first or early use of an idea by one of a set of organizations with similar goals”*⁴ (Bingham, R.D. 1976). **Altshuler** and **Zegans** stress action by defining Innovation as *“novelty in action”*.⁵ (Altshuler, A. and M. Zegans. 1990.)

Joseph Schumpeter gave so many definitions of economic Innovation in his Theory of Economic Development, and some of them were like follows;

1. *The introduction of a new good - that is one with which consumers are not yet familiar - or of a new quality of a good.*
2. *The introduction of a new method of production, which need by no means be founded upon a discovery scientifically new, and can also exist in a new way of handling a commodity commercially.*
3. *The opening of a new market, which is a market into which the particular branch of manufacture of the country in question has not previously entered, whether or not this market has existed before.*
4. *The conquest of a new source of supply of raw materials or half-manufactured goods, again irrespective of whether this source already exists or whether it has first to be created.*
5. *The carrying out of the new organization of any industry, like the creation of a monopoly position (for example through trustification) or the breaking up of a monopoly position.*⁶

Innovation can be means or ends according to **Downs** and **Mohr** who define it as *“adoption of means or ends that are new to the adopting unit”* (Downs, G. W. Jr. and L. B. Mohr. 1976.).⁷

¹ Downs, G. W. Jr. and L. B. Mohr. 1976. Conceptual issues in the study of Innovation. Administrative Science Quarterly 21: 700–15

² Rogers, E. M. 1992. Diffusion of Innovations: The challenge and the promise. In Diffusion of Innovations in the Public Sector, ed. Glen H. Cope, 3–32. Austin: The University of Texas Press.

³ Idem.

⁴ Bingham, R. D. 1976. The Adoption of Innovation by Local Government. Lexington: Lexington Books. In Hunmin K. (2002) “Approaches And Means Of Innovation In Korean Local Government” The Innovation Journal: The Public Sector Innovation Journal, Volume 11(2), article 2.

⁵ Altshuler, A. and M. Zegans. 1990. Innovation and creativity: Comparison between public management and private enterprise. Cities February: 16–24.

⁶ Walt Whitman Rostow, 1990. Theorists of Economic Growth from David Hume to the Present with a Perspective on the Next Century. Oxford University Press, New York. US. P 235.

⁷ Downs, G. W. Jr. and L. B. Mohr. 1976. Conceptual issues in the study of Innovation. Administrative Science Quarterly 21: 700–15

Meanwhile Change is the key point in **Moore, Sparrow and Spelman's** definition of Innovation, "any reasonably significant change in the way an organization operates, is administered or defines its basic mission," (Moore, M. H., M. Sparrow, and W. Spelman. 1997.).¹ In **Lynn's** definition of Innovation "Innovation is an original, disruptive and fundamental transformation of an organization's core tasks". (Lynn, L. E., Jr. 1997.)² Thus, Innovation is a new idea, action, means or ends that can bring about change. Novelty can be subjective or objective and change can be reasonably big or disruptive and fundamental.

Metcalfe (1998) declared that "Innovation introduces novelty into the economic sphere. Should the stream of Innovation dry up, the economy will resolve in a "stationary state" with little or no growth"³(Metcalfe 1998). Hence, Innovation is vital for long-run economic growth. It, also, tends to collect in certain industries/sectors, which subsequently rise more quickly, leading to structural transformations in production, supply and demand and, finally, organizational and institutional change. The ability to start the latter is central for the capacity to benefit from Innovation which is considered -in so many writings- a dominant explanatory reason behind differences in performance between firms, regions and countries. Firms that succeed in Innovation prosper, at the expense of their less able competitors. Innovative countries and regions have higher productivity and income than the less-innovative ones. Countries or regions that wish to catch- up with the Innovation leaders face the challenge of increasing their own Innovation activities towards leader- levels ⁴(Godinho and Fagerberg 2004). Anyway, several researchers, writers, innovators and strategists have recognized the value of an organization reaching growth to achieve greater profit in innovative ways, and many of them see the Innovation concept as a vehicle for creating new value and generating new wealth. And, while most cite the significance of a creative process in breaking the bonds of growth none prescribe an explicit process to do that. However an emphasis on creativity first entered the corporate world in the 1940s and 1950s. **Alex Osborn** and his colleague, **Sidney Parnes** recognized that *every human being has the potential to be creative, if given the opportunity and the right environment.* **Osborn's** innovative work on the creative process led to the process known as "Brainstorming." His work also led to one of the first creativity guidebooks, the classic Applied Imagination. Their work was supported by the research efforts of their whole team and which clearly confirmed that creativity is a developable natural skill in everyone.

¹ Moore, M. H., M. Sparrow, and W. Spelman. 1997. Innovation in policing: From production lines to jobs shops. In *Innovation in American Government: Challenges, Opportunities, and Dilemmas*, eds. Alan A. Altshuler and Robert D. Behn, 274–98. Washington, DC: Brookings Institute Press.

² Lynn, L. E., Jr. 1997. Innovation and the public interest: Insights from the private sector. In *Innovation in American Government: Challenges, Opportunities, and Dilemmas*, eds. Alan A. Altshuler and Robert D. Behn, 83–103. Washington, DC: Brookings Institute Press.

³ Metcalfe, J. S. (1998) "Evolutionary Economics and Creative Destruction", London: Routledge

⁴ Fagerberg J.Godinho .M.M., 2003. "Innovation and catching-up, the handbook of Innovation", chapter 20,draft 4.

Even if the systematic theoretical and empirical work on Innovation projects in companies was slow to advance but during the last few decades a relatively substantial literature has emerged. Generally, research about this topic agrees with **Schumpeter's** emphasis on uncertainty (Nonaka and Takeuchi 1995¹ and Van de Ven et al. 1999²). *It has also been highlighted that innovative firms need to consider the potential problems that "path dependency" possibly will produce*³ (Arthur W.B 1994). For instance, if a company selects a particular Innovation path very early, it may (if it would be lucky) get "first mover" advantages. But it, also, risks being "locked in" to this specific path through various self-reinforcing effects. ⁴ however and if the first mover finds out that there existed a superior path, he then might be in a big trouble because it will be late and costly to switch path, **Van de Ven et al** (1999) suggested that *"the best strategy which can be taken is to avoid being stuck to a particular path, and remain to different solutions/ideas"*⁵. From this point of view the stress is moved from the introduction of specific new and useful ideas to the general organizational procedures and processes for generating, considering, and acting on such insights leading to important organizational improvements or novelty of products, services, or processes. Through these diversities of perspectives, creativity is in general seen as the source for Invention and Innovation as the successful implementation of original and creative ideas within an organization.

Table 1 – Innovation, creativity, invention and science

INNOVATION vs INVENTION
Invention is the creation of a new concept. Innovation is reducing that concept to practice, and making it a commercial success.
INNOVATION vs CREATIVITY
Creativity is coming up with ideas. Innovation is bringing ideas to life.
INNOVATION vs SCIENCE
Science is the conversion of money into knowledge. Innovation is the conversion of knowledge into money.

Source: Composed according to Feldman, M., *The Significance of Innovation*, Rotman School of Management University of Toronto, 2004, p. 3-5 in Gerguri, Shqipe and Ramadani, Veland (2010)⁶

Table (1) provides a comparison between four main concepts linked together in so many areas, which are Innovation, creativity, invention and science.

¹ Nonaka, I. and H. Takeuchi (1995) *The Knowledge Creating Company*, Oxford: Oxford University Press, Cited in www.wikipedia.com. July 2009.

² Van de Ven, A., D.E.Polley, R. Garud and S. Venkataraman (1999) *The Innovation Journey*, New York: Oxford University Press, Cited in www.wikipedia.com. July 2009.

³ Arthur, W. B. (1994) *Increasing Returns and Path Dependency in the Economy*, Ann Arbor: The University of Michigan Press, Cited in www.wikipedia.com. July 2009.

⁴ Van de Ven et al, Idem

⁵ Van de Ven, A., D.E.Polley, R. Garud and S. Venkataraman (1999), idem.

⁶ Gerguri, Shqipe and Ramadani, Veland; (2010); *The Impact of Innovation into the Economic Growth*; MPRA paper, online at <http://mpra.ub.uni-muenchen.de/22270/>

I.2. Incremental Innovation and Radical Innovation:

The Incremental-Radical Innovation dichotomy is one of the well known theories that emerged during the late 1970s. Incremental Innovation is an Innovation that improves the conveyance of a currently delivered benefit, but produces neither a behaviour change nor a change in consumption, it involves small or big improvements that add value to the product and generate benefits to the customer. It's in fact so difficult to know who pioneered the Incremental-Radical dichotomy, partly because the concept was used by many authors, often with a different terminology but expressing the same meaning. We can use two dimensions to separate an incremental from a radical Innovation, and they are as the following:

1. *The first dimension is internal, based on the knowledge and resources involved in the Innovation. An incremental Innovation is built upon existing knowledge and resources within a certain company, meaning it will be as an enhancement for the product or service itself, while a radical Innovation, on the other hand, will require completely new knowledge and resources.*
2. *The second dimension, which is external, differentiates the Innovation based on the technological changes and on the impact upon the market competitiveness. An incremental Innovation will involve modest technological changes and the existing products on the market will remain competitive while radical Innovations involve large technological advancements, rendering the existing products non-competitive and obsolete.*

Under this framework it is clear that incumbents might have a hard time facing radical Innovation both for the reason that they operate under a “managerial mindset” constraint and because strategically they have less of an incentive to invest in the Innovation if it will cannibalize their existing products. Furthermore incumbents will be in a better position if the Innovation is incremental since they can use existing knowledge and resources to leverage the whole process. New entrants, on the contrary, will have a large advantage if the Innovation is radical because they will not need to change their knowledge background, **Audretsch** (1995), for instance, suggests that almost 90% of commercially significant Innovations in the US are actually incremental in nature¹.

Overall we can say that the Incremental-Radical dichotomy helped to explain some Innovation patterns, and there was favourable evidence for the model within most mature industries. Over the last decades, however, the model lost some reliability as the pace of change accelerated in

¹ Audretsch, D. B. 1995. *Innovation and Industry Evolution*, Cambridge, MA, MIT Press, cited in Love J. H. and Stephen Roper; (2004), “The organization of Innovation: collaboration, cooperation and multifunctional groups in UK and German manufacturing”; *Cambridge Journal of Economics*, 28, 379–395

most sectors. There were cases where new entrants managed to displace incumbents with incremental Innovations and other cases where incumbents kept their leadership exploiting a radical Innovation. The next table show the differences found between incremental and radical Innovation:



Table 2 Incremental vs. radical Innovation.¹

	Incremental	Radical
Emphasis	Cost or feature improvements in existing products, services, or processes	Development of new businesses, products and/or processes that transform the economies of a business
Technology	Exploitation of existing technology	Exploration of new technology
<u>Prototyping</u>	Ironing out wrinkles near the end of the design phase	Teaching the market about the new technology and learning from the markets how valuable that technology is in that application arena
Trajectory	Linear and continuous	Sporadic and discontinuous
Business Case	Detailed plan can be developed at the beginning of the process	Business model and plan evolves through discovery-based learning
Idea Generation & Opportunity Recognition	Occur at the front end; critical events are largely anticipated	Occur sporadically throughout the life cycle, often in response to discontinuities in the project trajectory
Key Players	Formal <u>cross-functional teams</u>	<u>Cross-functional individuals</u> , informal networks
Process	Formal, <u>phase-gate model</u>	Informal, <u>flexible model</u> at early stages due to high uncertainties → formal at later stages after uncertainties have been reduced
Organizational Structures	Cross-functional project team operates within a business unit	Project starts in R&D → migrates into an incubating organization → transitions into a goal-driven project organization
Resources and competencies	Standard resource allocation; the team has all competencies required to complete the process	Creative acquisition of competencies and resources from a variety of internal and external sources
Operating Unit Involvement	Formal involvement from the very beginning	Informal at early stages → formal at later stages

Source: http://www.1000ventures.com/products/ss_effective_Innovation.html

In the table (3) which is below we relied on a comparison between Incremental Innovation and radical Innovation in order to explain more the differences which are found between the two concepts.

Table 3: Incremental Vs Radical Innovations

INCREMENTAL INNOVATIONS	RADICAL INNOVATIONS
	

¹ <http://www.1000ventures.com>

Exploits existing technology	Explores new technology
Low uncertainty	High uncertainty uncertainty
Focuses on cost or feature improvements in existing processes, products or services	Focuses on products, processes or services with incremented performance features
Improves competitiveness within current markets or industries	Creates dramatic change that transforms existing markets or industries, or creates new one

Source: http://www.1000ventures.com/products/ss_effective_Innovation.html

I.3. Models of Innovation:

Little effort has been made by the business and policy communities to scientifically illustrate on the concepts, theories and empirical evidences that have been developed over the past decades of Innovation studies in order to improve the general atmosphere for Innovation. The significance of an understanding of Innovation as a process is however, that it outlines the way in which organizations manage it.

An early model of Innovation is The Linear Model of Innovation which suggests that technical change happens in a linear way from Invention to Innovation to Diffusion. This Model prioritises scientific research as the basis of Innovation, and plays down the role of later players in the Innovation process. Two versions of the linear model of Innovation are often presented: “technology push” model and “market pull” model. Anyway in the 1950s and 1960s the industrial Innovation process was in general perceived as a linear progression from scientific discovery, through technological development in firms, to the marketplace, **Rothwell** (1994) declared that the stages of the "Technology Push" model are: **Basic science**→**Design** and **engineering**→**Manufacturing**→**Marketing**→**Sales**.¹ A second generation of Innovation models emerged in the period Mid-1960s-Early 1970s, referred to as the "market pull" model of Innovation. Market pull reproduces a view of Innovation that goes further than invention and sees the importance of actual use. Anyway, the role of market pull has been introduced since **Eric von Hippel’s** discovery that *in many sectors users are common sources of important Innovations instead of manufacturers*². According to this uncomplicated sequential model, the market was the source of new ideas for directing R&D, which had a reactive role in the process. The stages of the “market pull” model are:

Market need→**Development**→**Manufacturing**→**Sales**.

According to **Von Hippel** also, *organizations should listen to their users in the first place, rather than their scientists or designers mainly in designing their Innovation strategies*, **Von Hippel** also defines *this focus in users to point out that in many markets it is not ordinary users that are the source of*

¹ Rothwell, Roy,(1994),”Towards the Fifth-generation Innovation Process”,in: International Marketing Review,Vol.11,No 1,1994,pp.7-31.

² W.J. Abernathy and J.M. Utterback, ‘A dynamic model of process and product Innovation’, *Omega*, vol. 3, no. 6 (1975), pp. 142–160.

*Innovation, but lead-users*¹.he, in fact, came to that result after some tests on computer users and then he found Innovation activity concentrated within the tested group as predicted: 87% of respondents in the lead user group built their own computer-aided-design equipment used to lay out printed circuit boards (PC-CAD) system versus only 1% of nonlead users².

Anyway, early models (both explicit and implicit models) saw Innovation as a linear order of functional actions. Either new opportunities occurring from research and development gave rise to functions and improvements which eventually found their way to the marketplace “technology push”, or else the consumer needs for something new or improved which then drew out new solutions to the problem “market pull”. The boundaries of such a concept are clear mainly because sometimes the ‘pull’ will dominate, sometimes the ‘push’, but successful Innovation requires an interaction between the two. Nevertheless it would be a useless Innovation, and thereby the firm would take so much risk through which it would risk to be “stuck in a dead end”.³ Actually the linear models of Innovation got so many criticisms concerning the linearity of the models. These models ignore the many feedbacks and loops that occur between the different “stages” of the process. Shortcomings and failures that occur at various stages may lead to a reconsideration of earlier steps and this may result in a new Innovation. A history of the linear model of Innovation may be found in **Godin Benoit** (2006).

Much recent work recognizes the limits of linear models, and tries to build more complexity and interaction into the frameworks. Most Innovation is disordered, involving false starts, risky steps, recycling between stages, and dead ends. **Van de Ven** and colleagues (2000) discovered the limits of simple models of the process.

Roy Rothwell also presented a useful historical viewpoint on Innovation management, suggesting that our appreciation of the nature of the Innovation process has evolved from simple linear models to progressively more complex interactive models (Table 4). Seeing Innovation as a multi-actor process, which requires high levels of integration at both intra- and inter-firm levels, and which is increasingly facilitated by IT-based networking⁴. In fact on the one hand there are merits to both the technology push and market pull views; relying profoundly on existing users can make companies too unadventurous, and susceptible to disruptive technologies that uncover needs unexpected by existing markets. On the other hand, history is full with examples of organizations that have blindly followed technological excellence without caring about real market needs.

¹ von Hippel, Eric (1988). *The Sources of Innovation*. Oxford University Press. ISBN 0-19-504085-6. p 102-115.

² Idem, p 17

³ Tidd, J. (2006) *From Knowledge Management to Strategic Competence: Measuring technological, market and organizational Innovation*, (Imperial College Press).

⁴ Tidd, J., Bessant, J. and Pavitt, K. (2005) *Managing Innovation: Integrating technological, market and organizational change*, Third edition, Wiley.

Table 4: Progress in conceptualizing Innovation: Rothwell’s five generations of Innovation models¹

Generation	Key features
First and second	The linear models – need pull and technology push
Third	Interaction between different elements and feedback loops between them – the coupling model
Fourth	The parallel lines model, integration within the firm, upstream with key suppliers and downstream with demanding and active customers, emphasis on linkages and alliances
Fifth	Systems integration and extensive networking, flexible and customized response, continuous Innovation

Source: Tidd et al, 2005.

I.4. Innovation Diffusion and product life cycle:

Diffusion of Innovations is a theory that explains how, why, and at what level new ideas and products spread through customers and users; it was first introduced by some scientists and researchers such as **Gabriel Tarde**, **Friedrich Ratzel** and **Leo Frobenius**. The diffusion of Innovations has been studied from many perspectives including historical, sociological and economic perspectives. The choice of concept is often dictated by the use to which the results will be put, but there is no doubt that insights from one perspective can inform the research in other disciplines (David 1990², Gordon 2003³). In this section of our research we offer a conceptual background and set out some of the frameworks that have been used for the analysis of the diffusion of Innovation. **Rogers** (1995) defines diffusion as "*the process by which an Innovation is communicated through certain channels over time among the members of a social system*".⁴ This definition underlines four vital features for the diffusion of Innovation which are: Innovation, communication channels, time and the dynamic process which happens within a social system. According to **Hall** (2003), "*Diffusion is one of the three pillars on which the successful introduction of new products, processes, and practices into society rests, along with invention (a new*

¹ Tidd, J., Bessant, J. and Pavitt, K. (2005); Idem.

² Gordon, R. J. (2003). "Five Puzzles in the Behavior of Productivity, Investment, and Innovation," in Global Competitiveness Report, 2003-2004, World Economic Forum.

³ David, P. A. (1990). "The Dynamo and the Computer: An Historical Perspective on the Modern Productivity Paradox." American Economic Review. 354-362.

⁴ Rogers, E. M. (1995). Diffusion of Innovations. Glencoe: Free Press. P 5.

idea) and commercialization/Innovation (reducing the invention to practice)”¹. Without diffusion, Innovation would have lesser impacts. So far, this section has been concerned with several sides and concepts of Innovation such as its sources and types, for example product Innovation process Innovation, technology-push and market-pull. This section progresses on to the diffusion of Innovations after they have been introduced in the classic *E. Rogers, Diffusion of Innovations, Free Press, 1995*; *C. Kim and R. Maubourgne, ‘Knowing a winning idea when you see one’, Harvard Business Review, vol. 78, no. 5 (2000), pp. 129–138*; and *J. Cummings and J. Doh, ‘Identifying who matters: mapping key players in multiple environments’, California Management Review, vol. 42, no. 2 (2000), pp. 83–104 (see especially pp. 91–97)*.² Nevertheless, without Innovation it, also, would be impossible to have anything to diffuse, thereby, and from this perspective it is clearly shown that there exists a correlation between Innovation and diffusion.

In the economic literature of Innovation, the word diffusion is in fact frequently employed to illustrate the process by which individuals and firms accept, implement and adopt a new idea or product, or replace an older technology with a newer one. Nevertheless diffusion is not only the means by which Innovations become useful by being extend all over a population, it is a fundamental component of the Innovation process as well.

Anyway; in view of the fact that Innovation is characteristically expensive, its commercial attractiveness can hinge on the pace at which customers adopt new products and services. This pace of diffusion is something managers can manipulate through the good understanding of technology-push and market-pull mechanisms and aspects. Moreover they (managers) they can model the pace of Innovation using the S-shaped curve which is illustrated in figure 1 later in this chapter.

The main aim of the Diffusion of Innovation studies is to understand when, how and why Innovations are adopted or rejected. The concern is then to map the explicit or implicit use of knowledge about an Innovation, rather than to try to grasp the ways in which such knowledge might impact on broader conceptual understandings about practice³ (Huberman, 1993), and moreover to understand the way that a company can influence its consumers to adopt its own Innovations.

In various ways, understanding the diffusion process is the means to better understand how innovative activities carried out by companies, governmental and non-governmental institutions create the improvements in economic and community welfare for their citizens.

¹ Bronwyn H. Hall (2003). «Innovation and Diffusion ». University of California at Berkeley, CA. US.(pdf version), pp 3-44.

² Ping Lan, (2010) “ON THE DESIGN OF A SEVEN-STAGE INNOVATION LIFE CYCLE” University of Alaska Fairbanks, US, found at <http://www.myacme.org/ACMEProceedings09/p36.pdf>

³ Huberman, M (1993) Linking the practioner and researcher communities for school improvement. School Effectiveness and School Improvement, pp 2-16.

That is why this topic had been a really and truly interesting one for so many researchers such as **Rosenberg** who declares that *“in the history of diffusion of many Innovations, one cannot help being struck by two characteristics of the diffusion process: its apparent overall slowness on the one hand, and the wide variations in the rates of acceptance of different inventions, on the other.”*¹ (Rosenberg, 1972). Since then; several studies go further than simply noting the pace and dissimilarity of diffusion, in that; some researchers correlated the rates of acceptance and adoption with the characteristics of the technologies and their potential adopters in an effort to clarify the pace of diffusion and the crucial acceptance of the new products. Moreover; another key characteristic of the diffusion process is the manner in which it interacts with the innovative process.

Rosenberg (1982) highlighted the fact that *the diffusion of Innovation is often accompanied by learning about the use of the Innovations in several environments, which would help the innovator improving the original Innovation*. Nevertheless this has not been studied enough, due to the complexity and difficulty of gathering efficient data.²

The literature of diffusion of Innovation is demonstrated also by **Rogers’** well-known book, *Diffusion of Innovations*. In this book, **Rogers** (1995) synthesizes research from over 508 diffusion studies and generate a theory for the adoption of Innovations among individuals and organizations. He also evaluates this subject first and foremost from a sociological standpoint, but one that is informed by research on organizations, the role of economic factors, and the strategies of organizations and development agencies. **Rogers** (1995) provides a helpful set of five analytic categories that categorize the attributes that pressure the potential adopters of an Innovation (Rogers calls them: the perceived characteristics of an Innovation in his model of Innovation which would be introduced later in this chapter –see exhibit 5) which can be valuable to estimate the impact of Innovation:

- 1) *The relative advantage of the Innovation.*
- 2) *Its compatibility, with the potential adopter’s current way of doing things and with social norms.*
- 3) *The complexity of the Innovation.*
- 4) *trialability, the ease with which the Innovation can be tested by a potential adopter.*
- 5) *observability, the ease with which the Innovation can be evaluated after trial.*³

¹ Rosenberg, N. (1972) “Factors Affecting the Diffusion of Technology.” *Explorations in Economic History*, 10, no. 1: 3–33. P 191. cited in Hall Bronwyn H. (2003) “Innovation and Diffusion” Hall on Diffusion, US. Found at http://elsa.berkeley.edu/~bhall/papers/Diffusion_Ch18_BHHfinal.pdf.

² Rosenberg, N. (1982). ““Learning by Using.” in N. Rosenberg, *Inside the Black Box*”. Cambridge, Cambridge University Press, pp 120-140. cited in Hall Bronwyn H. (2003), Idem.

³ Rogers, E. M. (1995). *Diffusion of Innovations*, fourth edition. New York: The Free Press. Pp254-268

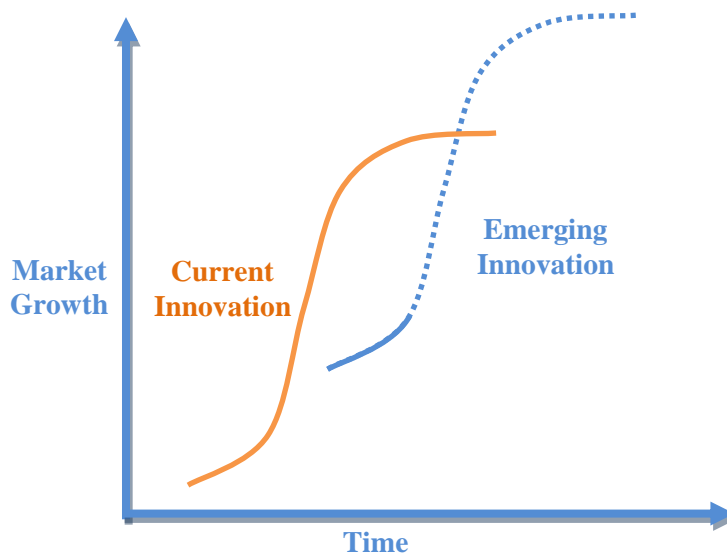
The previous model of **Rogers** includes several aspects which are vital to understand the diffusion factors, just like *the trialability and observability which are directly related to the uncertainty faced by the Innovation adopter, and moreover we have the complexity of Innovation which is a key determinant of Innovation diffusion, it has been widely accepted that it is also related to the cost and complementary investment concepts, thereby it would be a strong competitive advantage* (if developed by the firm). He in the same edition affirms that there exists a variety of conditions that may accelerate or slow the process of diffusion; those conditions are cited in Rogers' book as the following ones:

- 1) Whether the decision is made collectively, by individuals, or by a central authority.
- 2) The communication channels used to acquire information about an Innovation, whether mass media or interpersonal.
- 3) The nature of the social system in which the potential adopters are embedded, its norms, and the degree of interconnectedness.
- 4) The extent of change agents' (advertisers, development agencies, etc.) promotion efforts.¹

It is a well-known fact that when the number of users of a new product is designed versus time, the adoption progresses slowly in the early stage, accelerates as it extends throughout the potential adopting population, and then it slows down once the adopting population becomes saturated. There are several models explaining the diffusion in adoption times using different ways to show the mechanisms that affect the phenomenon, one of them is widely known as the "epidemic model" which uses the mechanism of 'consumer learning' as a main device.

In this model, consumers can have identical needs and the cost of the new technology can be constant over time, but not all consumers are informed about the new technology at the same time. Mainly for the reason that every consumer learns (hears) about the new product from his neighbors and relatives, as time passes, more and more consumers use the new product during any period, leading to an increasing level of adoption. Somehow, theoretically other new products emerge, and in this case the pace of diffusion decreases. This will generate an S-shaped curve for the diffusion rate. However, The S-shaped curve derives from an assumption that new Innovations are likely to have "a product Life cycle"; i.e. a start-up phase, a rapid increase in sales and eventual decline. Once the older market gets saturated leading to old Innovations decline innovative companies keep working on new Innovations in order to replace older ones and moreover to enhance their competitiveness throughout enhancing older technologies (see Figure 1 which follows).

¹ Idem.

Figure 1: S-curve of Innovation diffusion

Source: Wikipedia, the free encyclopedia; June 2009.

Thereby, other s-curves will come along to replace older ones and drive the firms' growth upwards. In the exhibit above the first curve shows a current technology while the second shows an emerging technology that current yields lower growth but will finally go beyond current technology and lead to even greater levels of growth. As several authors have stressed, as diffusion progresses learning about the technology takes place, the Innovation is improved and adapted to different environments, thus making it more attractive to a larger set of adopters¹ ²(Rosenberg, 1972; Nelson et al., 2002). The raise in the weight of standards that has accompanied the development in importance of the information industries has led to a significant result economic modeling. By adding heterogeneity in consumer's tastes and adoption processes has produced more complexity which necessitates more complex models of diffusion³ ⁴(Wendt and Westarp 2000; Bassanini and Dosi 1998).

Industrial organization and strategy theorists have centered their modeling efforts on the implications of increasing returns in adoption for competitive strategy and market structure. Examples of this literature include **Katz and Shapiro** (1985, 1986, 1994), **Farrell and Saloner** (1992), and **Shapiro and Varian** (1999). *In a series of papers, Katz and Shapiro have explored the implications of consumer adoption behavior in the presence of network externalities for the strategic*

¹ Rosenberg, N. (1982). Idem

² Nelson, R. R., A. Peterhansl, and B. N. Sampat (2002). "Why and How Innovations Get Adopted: A Tale of Four Models." New York: Columbia University. US.

³ Wendt, O., and F. von Westarp (2000). "Determinants of Diffusion in Network Effect Markets." Paper presented at the 2000 IRMA International Conference, Anchorage, Alaska.

⁴ Bassanini, A. and G. Dosi (2000). "Heterogeneous Agents, Complementarities, and Diffusion. Do Increasing Returns Imply Convergence to International Technological Monopolies?," in D. D. Gatti, M. Gallegati and A. Kizmon (eds.), *Market Structure, Aggregation, and Heterogeneity*. Cambridge, Cambridge University Press.

interactions among firms offering competing products. In general, the theoretical literature of which these papers are an example identifies multiple possible equilibrium among firms competing in such environments, so that it is difficult to draw firm conclusions.¹ Overall we can say that the S-Curve is a robust yet flexible framework to analyze the introduction, growth and maturation of Innovations and to understand the technological cycles. The model also has plenty of empirical evidence; it was exhaustively studied within many industries including semiconductors, telecommunications, hard drives, photocopiers, jet engines and so on.

Empirical research on the diffusion of Innovations has generated a wide array of propositions and generalisations about the nature of the diffusion process and the factors that encourage and inhibit the level of adoption most of them are related to the following areas: the Innovation-decision process, attributes of Innovations and their level of adoption, innovativeness and adopter categories, diffusion networks, change agents, Innovation in organizations, and the consequences of Innovations. “Box 1” summarizes the review of the literature of those factors.

Table 5: Factors affecting the likelihood that a particular Innovation will be adopted

Factors	Examples of research findings
1. Innovation attributes	<ul style="list-style-type: none"> ➤ Rogers (1995) argues that there are five attributes of an Innovation which influence its level of adoption: relative advantage, compatibility, complexity, trialability and observability. ➤ Wolfe (1994) highlights six key attributes found to influence adoption: adaptability, centrality to the day-to-day work of the organization, technical vs. administrative focus, pervasiveness (the proportion of total behaviors expected to be affected by the Innovation), radicalness, and uncertainty about outcome. ➤ Characteristics identified by Stocking (1985) include appeal to local power holders and little requirement for visible resources.
2. Adopter characteristics	<ul style="list-style-type: none"> ➤ Adopters can be categorised according to their tendencies to adopt - innovators, early adopters, early majority, late majority and laggards (Rogers, 1983). Each group is ideally targeted with a different diffusion strategy (Green and Johnson, 1996). ➤ Organizations with a long history of success are less likely to adopt new concepts (Sitkin, 1992; Levinthal and March, 1993; O'Neill, et al., 1998). ➤ The organizational factors that are important in explaining the level and process of

¹ Bronwyn H. Hall (2003). *Idem*; pp 18-24

	adoption include: strategy, structure, resources and politics (Dean, 1987; Dyer and Page, 1988; Schroeder, et al. 1989).
3. Environmental/ context characteristics	<ul style="list-style-type: none"> ➤ Low environmental uncertainty increases the tendency of organizations to remain stable or to avoid change (O'Neill, et al., 1998). ➤ High uncertainty or need for legitimacy may encourage imitation in the adoption of Innovations (DiMaggio and Powell, 1983). ➤ Choices about whether to adopt or not can relate to the existence of fads and fashions amongst members of a social network (Abrahamson, 1991, 1996).
4. The characteristics of those promoting the Innovation	<ul style="list-style-type: none"> ➤ The level of change agent contact with potential adopters is positively related to the decision to adopt (Rogers, et al., 1970). ➤ Change agent credibility in the client's eyes is positively related to the decision to adopt (Coleman, et al., 1966). ➤ Change agents may or may not be members of the target social system, whereas opinion leaders are. The most effective persuaders are similar in status and outlook to potential users. 'Near-peers' are thus seen as key in bridging the gap between innovators and adopters (Rogers, 1995). ➤ Opinion leaders are especially important for interpersonal networks whose members differ in many respects (Rogers, 1983; Kautz and Larsen, 2000).
5. Communication channels	<ul style="list-style-type: none"> ➤ Mass media communication channels are more effective when there are large numbers of potential adopters and low levels of complexity, and when the goal is awareness raising (Rogers, 1995). ➤ Interpersonal and local channels are important in persuading adopters to act upon their awareness and adopt (Rogers, 1995).

Source: Nutley S. et al (2002), ¹

I.4.a. Diffusion of Innovation Model:

The process of diffusion is considered to revolve around four key elements: an idea or Innovation, channels of communication to spread knowledge of the Innovation, time during which diffusion takes place, and a social system of potential adopters in which this occurs ²(Rogers, 1995). In fact there exist several models that aim to represent how these elements interact with one another in ways that diffuse

¹ Nutley S, Davies H, Walter I (2002), "Learning from the Diffusion of Innovations- Conceptual Synthesis 1-" Research Unit for Research Utilisation Department of Management University of St Andrews St Katharine's West. London, pp 14-29.

² Rogers E.M. (1995), Idem.

*Innovations among society. Four models have been recognized to characterize the Innovation diffusion process*¹ (Williams and Gibson, 1990):

- The appropriability model, which emphasises the importance of quality research and competitive market pressures to promote the use of research findings.
- The dissemination model, where experts inform potential users of the new technology.
- The knowledge utilisation model, which stresses the importance of interpersonal communication between researchers and users and the role of organizational barriers and facilitators in promoting research use.
- The communication and feedback model, which characterises technology transfer as an interactive process where individuals exchange ideas simultaneously and continuously.

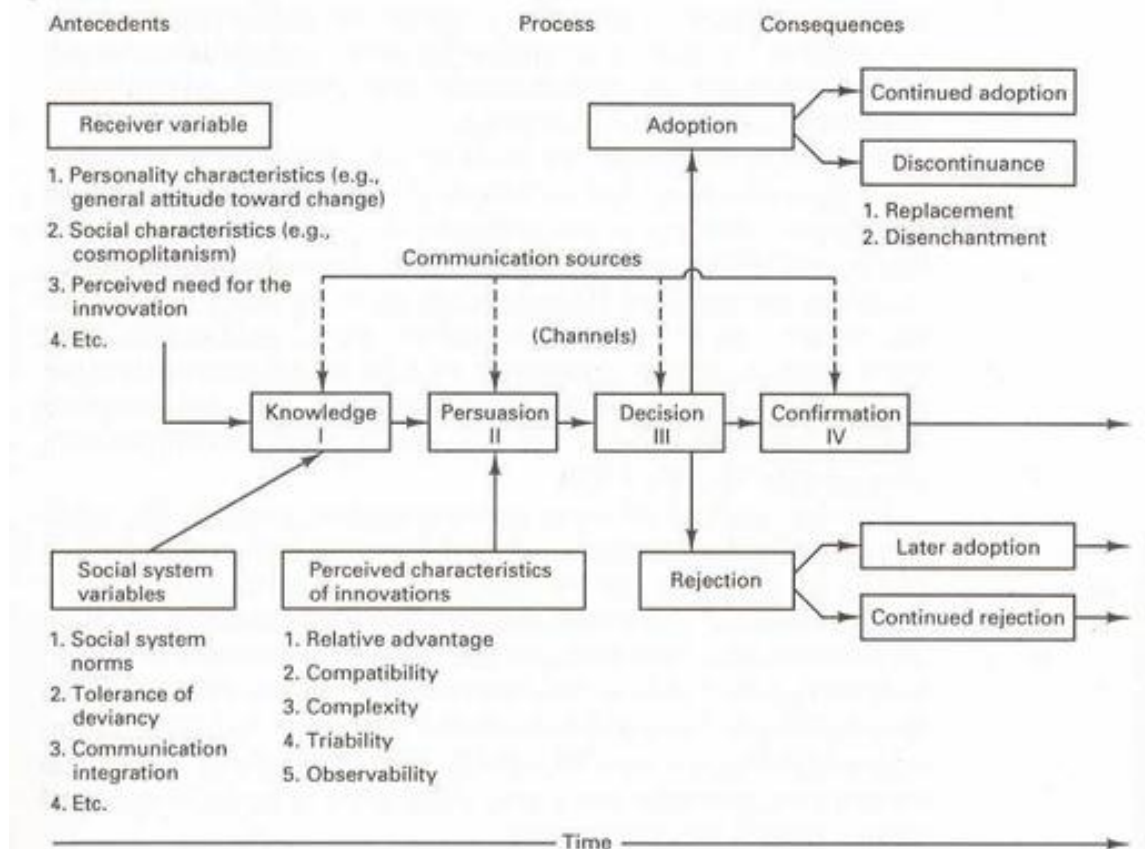
In the early models the stress is on the Innovation itself, and on the channels of communication channels, while later models integrate not only 'technology-push' but also 'market-pull', where research is called to meet potential users' needs fulfilment. In later models the method of interaction between the Innovation and potential adopters becomes the focus of thought. Nevertheless, there is considerable overlap between most of the models, and that most frequently cited is **Rogers'** (1983, 1995) five-stage representation of the Innovation-decision process. Within this model the process of adoption is said to pass through the following five stages: (see the figure 2 below, for more understanding)

- Knowledge: the individual (or decision-making unit) is exposed to the Innovation's existence and gains some understanding of how it functions.
- Persuasion: the individual (or unit) forms a favourable or unfavourable attitude toward the Innovation. This may involve, for example, a matching of the Innovation to a perceived problem, and some kind of appraisal of the costs and benefits of adoption.
- Decision: the individual (or unit) engages in activities that lead to a choice to adopt or reject the Innovation. This may include interaction with forces of support or opposition that influences the process.
- Implementation: the individual (or unit) puts an Innovation into use.
- Confirmation: the individual (or unit) seeks reinforcement for an Innovation-decision already made, but may reverse this decision if exposed to conflicting messages about the Innovation ²(Rogers, 1995).

¹ Williams and Gibson D.V (1990) *Technology Transfer – A Communication Perspective*. London, UK: Sage. Cited in Nutley S, Davies H, Walter I (2002), *Idem*, p 9.

² Rogers E.M. (1995), *Idem*, p 202.

Figure 2: Diffusion of Innovation model.



Source: Everett M. Rogers (1995)¹

I.5. New Product Development (NPD) models: Theoretical perspectives

The emergence of a main design affects the characteristics of Innovation. In assembled products, a dominant design is a synthesis, based on earlier technological Innovations and first mover perspectives, which emerges after a period of experimentation in the production of the product. Once a dominant design emerges, other companies follow the new standard and seek economies of production ²(Utterback, 1994).

Saren (1984) categorized new product development models in terms of five types: (1) departmental-stage models, (2) activity-stage models, (3) decision-stage models, (4) conversion process models and (5) response models.³

(1) First of all; departmental-stage models; product development process is based on the specialization segmentation of the functions¹ (Takeuchi and Nonaka, 1986). The departments are in charge for

¹ Cited in http://www.tcw.utwente.nl/theorieenoverzicht/Theory%20clusters/Communication%20and%20Information%20Technology/Diffusion_of_Innovations_Theory.doc/

² Utterback, J.M. (1994).Idem.

³ Saren, M. (1984) "A classification of review models of the intra-firm Innovation process". R&D Management, 14, 1,pp 11–24.

the different tasks carried out within the development process² (Saren, 1984). The development project in this case moves consecutively from phase to phase. However; it is widely accepted that this kind of project management is deficient in several ways. Mainly because the control of the process is generally lost between departments and especially when the idea is adapted in an isolated way while switching the departments; moreover for the reason that this kind of project management consume more time than others. Furthermore there are no clear rights or ownership of the new product by any department. And finally, there is no market feedback on the development process³ (Hart and Baker, 1994).

- (2) *Second of all; Activity-stage models are an enhancement in ways that there is a cross-functional know-how involved at each stage⁴ (Saren, 1984). Development stages are differentiated by activities, which are carried by appropriate departments.*
- (3) *Decision-based models include estimation points between each stage of the process. This concept identifies feedback loops overlooked in previous models.*
- (4) *Conversion process models treat new product development as a process by which input is converted into outputs in order to avoid mechanistic forms of project management⁵ (Hart and Baker, 1994). Undetermined conversion tasks may or may not be carried out, depending on the nature of the Innovation (Schon, 1963⁶; Cooper, 1982⁷). The conversion process in the system thereby is influenced by organization, human and resource factors.*
- (5) *Finally the response model deals with response to such changes as new product ideas, or R&D project proposals in terms of acceptance or rejection of the idea⁸ (Hart and Baker, 1994).*

Nevertheless, process based industries are not well represented in the economic literature like the new product development models are. However, Lager (2000) introduces two models of process development. The first one includes four steps (1) *laboratory testing*, (2) *pilot plant testing*, (3) *trials in a demonstration plant* and (4) *production plant tests* (see figure 3). He highlights the complex and disordered nature of process development in process-based industries.

Figure 3: A traditional model for process development⁹

¹ Takeuchi, H. and Nonaka, I. (1986). "The new product development game". Harvard Business Review, Boston, MA.US. pp 137–146.

² Saren, M (1984) Idem, p 17

³ Hart,S.J. and Baker, M.J. (1994). "The multiple convergent processing model of new product development". International Marketing Review, pp 77–92.

⁴ Saren, M. idem. P 17

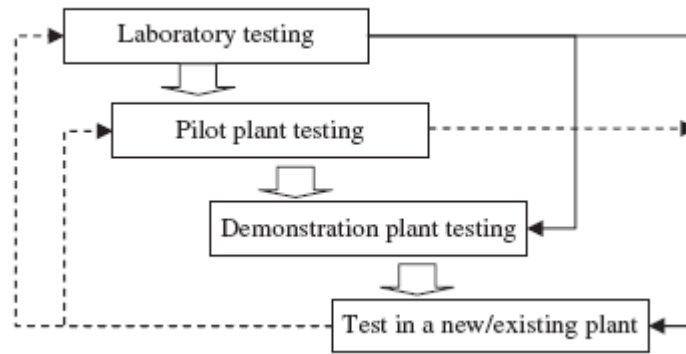
⁵ Hart .S.J and Baker. M.J. (1994), Ibid.

⁶ Schon, D. (1963) Champions for radical new inventions. Harvard Business Review, 77–86.

⁷ Cooper, R.G. (1982) "New product success in industrial firms". Industrial Marketing Management, 215–223.

⁸ Hart .S.J and Baker. M.J. (1994), Idem.

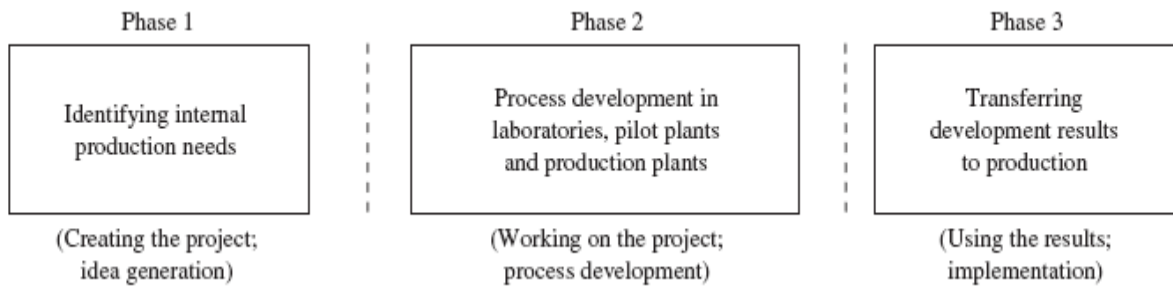
⁹ Lager, T. (2000) "A new conceptual model for the development of process technology in process industry". International Journal of Innovation Management, 320–345.



Source: Lager, T. (2000) "A new conceptual model for the development of process technology in process industry". *International Journal of Innovation Management*, 320-345.

The model depicted in Figure 3 deals with plant operations and does not apply to development projects. Another model, based on **Utterback's** work, is provided by Lager (2000) to deal with the management of product or process development projects and involves three development phases (see Figure 4).

Figure 4: 'Process development process' A conceptual model

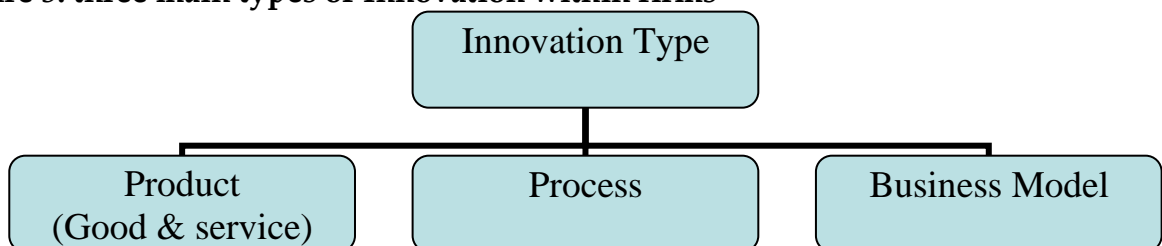


Source: Lager, T. (2000) "A new conceptual model for the development of process technology in process industry". *International Journal of Innovation Management*, P.330.

I.6. Innovation Types:

Once we think about Innovation right away the word "new technology" comes to mind, because of the strong link between Innovation and new technology but this assumption is too simplistic because Innovation may take a number of Innovation forms or types, the most known types of Innovation include: process, product (including goods and services), and business model Innovations. As illustrated in figure 5 which follows.

Figure 5: three main types of Innovation within firms



Source: The Author.

In this research we are trying to find out the links between these three types of Innovation within Algerian firms and especially that product Innovation is what brings added values for the firms and it is the source through which the company and its stakeholders can benefit from, while process Innovation is one of the vital ways which help the firm to gain a sustainable competitive advantage all the way through finding new useful and efficient ways to do things, and finally there is business model Innovation by which international companies such as Apple, Google, Yahoo! and so many others have generated great revenues in the last few years.

In several well known cases, the market entry may involve a combination between Product, process and business model Innovations.

I.6.a. Product and Process Innovation:

We find a large body of literature on the management of new product development. Researchers have also been addressing innovative developments in the production process, especially in continuous process industries (e.g. Pisano, 1997¹; Lager, 2002²).

Product improvement aims to develop the properties and performance of the product while process development has internal production objectives such as cost reduction and yields improvements (Pisano, 1997³; Lager, 2002⁴). According to **Pisano**; “product development is seen to shift the demand for the product whereas process development reduces costs and initially shifts the supply curve”⁵ (Pisano, 1997).

Developing new products and processes is increasingly a focal point of competition and success for the firm, and often requires the development and successful implementation of novel process technologies⁶, but technology push and market pull differ and vary over time, and then managers or business owner must find a balance between the two, so must they determine the emphasis to place on product or process Innovation, mainly because product Innovation relates to the final product/service to be sold, especially with consideration to its features, and characteristics; but process Innovation relates to the way in which this product or service is produced and distributed, chiefly with regard to improvements in cost, production time or reliability. Thereby some firms choose to innovate in their products and services, while others specialize in process. In fact, Industries often track technological trajectories according to which the relative significance of product Innovation and process Innovation change over time. And it

¹ Pisano, G. (1997) “The Development Factory”. Harvard Business School Press. Boston, MA US.

² T.Lager. (2002) “A structural analysis of process development in process industry”. R&D Management, 32, 1, 87–95.

³ Pisano, G. (1997) Idem.

⁴ T.Lager. (2002). Idem.

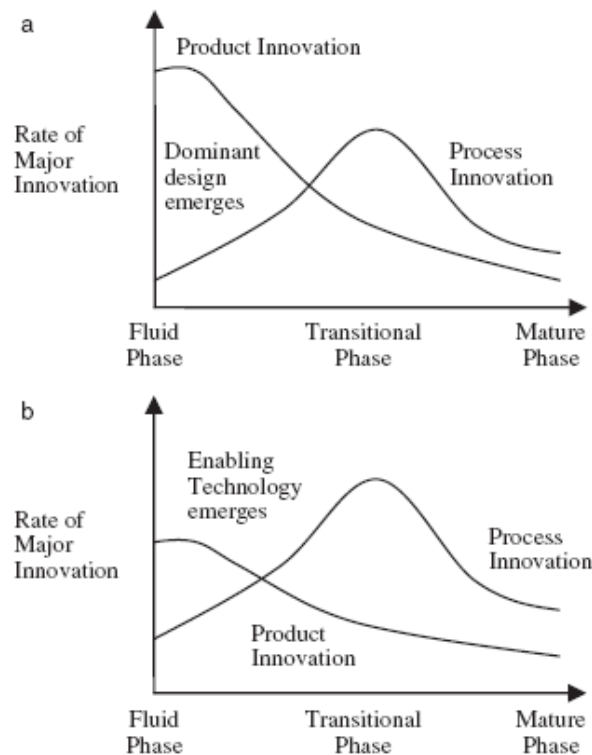
⁵ Pisano . G, Idem.

⁶ Lisa P. L. Lim, Elizabeth Garnsey and Mike Gregory (2006). “Product and process Innovation in biopharmaceuticals: a new perspective on development”, Institute for Manufacturing, University of Cambridge, UK, Published by Blackwell Publishing Ltd. Oxford,UK. pp 27-31.

is known in the business literature that periods of product Innovation based on new characteristics and features are often followed by periods of process Innovation based on efficiency in production and delivery.¹

The Model of **Abernathy** and **Utterback** (1978)² helped us to understand the dynamics of product and process development and competitive environment in relation to the life cycle of the industry itself and both at the level of the organization. “Figure 6” illustrates that relationship; it was clearly shown that during the appearance period of an Innovation, the level of product Innovation exceeds the level of process Innovation. When a dominant design emerges, organizations focus on process improvement to improve the cost and quality of the product (figure 6a). The model was further developed by **Utterback** (1994) to include Innovation in continuous process industries (figure 6b).

Figure 6: Patterns of Innovation.³



Source: Utterback, J.M. (1994) *Mastering the Dynamics of Innovation*. Boston,MA: Harvard Business School Press.

The cycle of product Innovation leading to the establishment of a process Innovation, is in fact a common one across many industries. This sequence of product to process Innovation is not always a tidy one; they are actually often pursued in tandem. Figure 7 provides a general model

¹ W.J. Abernathy and J.M. Utterback, (1975) 'A dynamic model of process and product Innovation', *Omega*, vol. 3, no. 6, pp. 142–160.

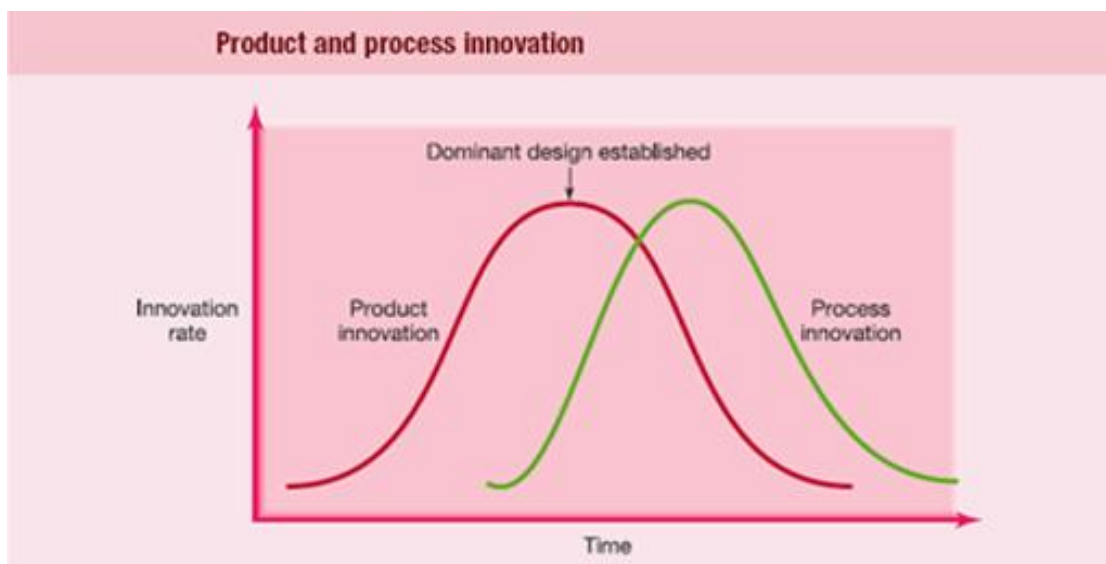
² Utterback, J.M. (1994) *Mastering the Dynamics of Innovation*. Boston,MA: Harvard Business School Press.

³ Idem.

of the relationship between product and process Innovation. The model has several strategic implications, which are as the following ones:

- New developing industries typically favour product Innovation, as competition is still around defining the basic features of the product.
- Maturing industries naturally favour process Innovation, as competition shifts towards efficient production of a dominant design of product or service.
- Small new entrants typically have the greatest opportunity in the early stages of an industry, competing with new features. Before the Model T, there were more than 100 competitors in the American automobile industry.
- Large firms typically have the advantage later as the dominant design is established and scale economies and the ability to roll out process Innovations matter most.

Figure 7: the relationship between product and process Innovation



Source: Adapted from W.J. Abernathy and J.M. Utterback; Idem pp. 639-656.

The models of new product development do not demonstrate how product and process Innovations can be coordinated. However, increasingly widespread practices and researches (e.g. Clark and Fujimoto¹, 1990; Ulrich and Eppinger², 2000) point to the importance of coordinating and integrating process and product Innovation. **Pisano** (1997) also suggested a different perception on the relations among product and process Innovation. He pointed out that “several kinds of industries such as the biopharmaceuticals industry is a process enabling industry, where both product and process technologies progress rapidly and then they must be well synchronized”.³

¹ Clark, K.B. and Fujimoto, T. (1990). “The power of product integrity”. Harvard Business Review, 68, 6, 106–118.

² Ulrich, K. and Eppinger, S.D. (2000). “Product Design and Development”. New York; US: McGraw-Hill.

³ Pisano, G. (1997) Idem.

I.6.b. Business model Innovation

Several worldwide known successful Innovations rely upon the reorganization of all the elements of business into new combinations (in ways that benefit the organization and its stakeholders) and not only upon new technologies. In this context innovators in fact are trying to create whole new business models, attract customers, suppliers and producers together in new ways, with or without new technologies. **Gary Hamel** (2000) defines a business model as a *'way of doing businesses'*.¹ A business model can also describe the structure of product, service and information flows and the role of participating parties. The key elements of a business model can be seen in terms of two halves of the value chain framework, introduced in section² Consistent with our assumption that innovators are rational actors, we assume that every Innovation success or fail rely on several characteristics and conditions such as the added value of the Innovation for firms (AV) and newness to customers (N) while that newness might fulfill the customers' needs. Otherwise the added Value of a given Innovation opportunity may be calculated through the following formula:

$$AV = V - C \dots (I)$$

Where: V means the value of the Innovation for the firm³ **Harvard Business School** define the value of an Innovation, V, as the benefit that a party expects to gain from converting an Innovation opportunity into a new design-the recipe-and then turning the design into a useful product, process or service.

C means all the costs taken by a firm because of the Innovation.

Every Innovation opportunity then can be illustrated in terms of its value and costs, by the way, costs of an Innovation can be divided into four main kinds which are: design cost, communication cost, production cost and transaction cost. we can however resume these four sorts of costs like follows;⁴

According to **Simon** (1962), design costs (d) include four types of costs which are (1) the cost of identifying the functional requirements (that is, what the design is supposed to do); (2) the cost of dividing the overall problem into sub-problems, which can be solved separately; (3) the cost of solving the sub-problems; and (4) the cost of recombining the sub-problems' solutions into a functioning whole⁵. Design costs then are costs of building and creating the design for an Innovation and the procedures that through them Innovation can be realized. Communication

¹ G. Hamel, *Leading the Revolution*, Harvard Business School Press, 2000.

² J. Magretta, (2002) 'Why business models matter', *Harvard Business Review*, vol. 80, no. 5, pp. 86-92

³ It means also the price at which the Innovation is sold by the original firm and not in the market place, mainly because of the length of the supply chains or distribution channels which might be the reason for which the Innovation's final price is quite high.

⁴ Carliss Y. Baldwin Eric von Hippel (2009) "Modeling a Paradigm Shift: From Producer Innovation to User and Open Collaborative Innovation" Working Paper, Harvard Business School, Boston, MA, US.

⁵ Simon, Herbert A. (1981) *The Sciences of the Artificial*, 2nd ed. MIT Press, Cambridge, MA, US, 193-229.

costs, (c), are the costs incurred by a firm while it is designing a new Innovation, mainly because that Innovation include several parts or the processes through which that Innovation is designed and accomplished necessitate communication and ideas or product switches among participants during the design process. While carrying out the design instructions to generate the new product or service, firms incur another kind of costs that is Production cost, (m), which includes all costs of production ingredients through which the design is converted into usable form for users. Transaction costs, (t), includes the costs of creating exclusive rights to the Innovation through keeping it secret or by getting the copyrights or patents, thereby they are the costs of establishing property rights and engaging in compensated exchanges of property. Transaction costs include also the costs of controlling opportunistic behavior¹ (Williamson, 1985); and accounting for transfers and compensation² (Baldwin, 2008).

For this and formula (I) we can say about an Innovation “viable” if and only if:

$$AV > 0$$

$$\text{This Means that } V - C > 0 \rightarrow V > C$$

$$\rightarrow V > d + c + m + t^3$$

By the way, Innovation costs as well as benefits are known to potential innovators, although there may be uncertainty in their estimation. And especially that costs and values of an Innovation may differ both across individuals and across the three models of Innovation.⁴

II. Sources and factors of innovation

After introducing and defining innovation, its types and models in the first section; we are going to study the sources and factors of innovation; to do that, we divided this section into four sub-titles; which are: 1) Sources of Innovation; 2) What Drives Innovation?; 3) Innovation and firm size, and 4) Innovation and market structure .

II.1. Sources of Innovation

The sources of Innovation vary greatly. For instance in some fields, Innovation users develop most Innovations. In others, suppliers of Innovation related components and materials are the usual causes of Innovation. While in other fields, predictable wisdom holds and product manufacturers are indeed the typical innovators. Obviously there exist several sources of Innovation. In the linear model of Innovation the habitually recognized source is manufacturer

¹ Williamson, Oliver E. (1985). *The Economic Institutions of Capitalism*, New York, NY: Free Press. Cited in idem, p11

² Baldwin, Carliss Y. (2008) "Where Do Transactions Come From? Modularity, Transactions and the Boundaries of Firms," *Industrial and Corporate Change* 17(1):155-195. cited in opcit Carliss Y. Baldwin Eric von Hippel (2009), p 11.

³ Carliss Y. Baldwin Eric von Hippel (2009), *ibid*, p 12.

⁴ Idem, pp 11-14.

Innovation this is where an economic agent innovates in order to sell the Innovation. Another source of Innovation is now widely known as end-user Innovation that has been identified by **Eric von Hippel** (1988) in his classic work on the subject of Sources of Innovation; end-user Innovation can be achieved where a person or an organization develops an Innovation for their own use because existing products/processes do not meet their needs.¹

In fact a great deal of novelty is done by users of Innovations actually implementing and using new and/or improved products or services as part of their regular activities. According to **von Hippel** (1988, *users can be innovators if they are the first who developed a later commercialized scientific instrument Innovation*). When users were found to be first they can be called as “Innovators”; those may become entrepreneurs, selling their new or improved products, they may decide to commercialize their Innovations, or they may be adopted by their manufacturers; and moreover they may also choose to freely reveal their Innovations, using methods like open source. In such networks of Innovation the users or communities of users can further develop technologies and reinvent their social meaning.² More recent theoretical work moves beyond this simple dualistic problem, and through empirical work shows that Innovation does not just happen within the industrial supply-side, or as a result of the articulation of user demand, but through a complex set of processes that links many different players together – not only developers and users, but a wide variety of intermediary organizations such as consultancies, standards bodies etc. Work on social networks suggests that much of the most successful Innovation occurs at the boundaries of organizations and industries where the problems and needs of users and the potential of technologies can be linked together in a creative process that challenges both.

Anyway, Innovation can be done by businesses in several manners, but it may be developed by less formal modifications of practice, through exchange and combination of professional experience and by many other routes. The more radical and revolutionary Innovations tend to emerge from R&D, while more incremental Innovations may emerge from practice – but there are many exceptions to each of these trends. Regarding user Innovation, a great deal of Innovation is done by those actually implementing and using technologies and products as part of their normal activities. Sometimes user-innovators may become entrepreneurs, selling their product, they may choose to trade their Innovation in exchange for other Innovations, or they may be adopted by their suppliers. Nowadays, they may also choose to freely reveal their Innovations, using methods like open source. In such networks of Innovation the users or

¹ von Hippel, Eric (1988). *The Sources of Innovation*. Oxford University Press. ISBN 0-19-504085-6. p 3-25.

² Tuomi, Ilkka (2002). *Networks of Innovation*. Oxford University Press. ISBN 978-0-19-925698-3.

communities of users can further develop technologies and reinvent their social meaning. Whether Innovation is mainly supply-pushed (based on new technological possibilities) or demand-led (based on social needs and market requirements) has been a hotly debated topic. Similarly, what exactly drives Innovation in organizations and economies remains an open question. More recent theoretical work moves beyond this simple dualistic problem, and through empirical work shows that Innovation does not just happen within the industrial supply-side, or as a result of the articulation of user demand, but through a complex set of processes that links many different players together – not only developers and users, but a wide variety of intermediary organizations such as consultancies, standards bodies etc. Work on social networks suggests that much of the most successful Innovation occurs at the boundaries of organizations and industries where the problems and needs of users and the potential of technologies can be linked together in a creative process that challenges both.¹

II.2. What Drives Innovation?

In many ways the discussions made about Innovation are not really new, boards are spending more time discussing Innovation and what conditions and factors can drive the Innovation process and especially that companies all around the world see Innovation as a long game in which they can win or lose, thereby, they are continuously trying to tilt the odds in their favour, in order to win that game of Innovation. In the recent few years the academic evidence appears to indicate that there exist four factors drive the Innovation process of firms, and that we will discuss briefly later in this chapter, which are:

- *The structure of the industry*
- *The economic structure of the firm*
- *The organizational structure of the firm*
- *The historical development of the firm*

The firm does not activate in a vacuum but in a very complicated environment full by several factors mainly those that construct and characterize the structure of its industry which is a main determinant of whether or not it innovates. Empirical evidences point out that firms in industries where Innovation is necessary do innovate, and it is the case of those which are facing a strong competitiveness. However, the evidence also shows that the Innovation process is a high risk, but potentially high profit venture, the fundamental uncertainty that cannot be totally taken off from the Innovation process, can be limited in industries and environment which help innovative firms; mainly those that include a very sophisticated intra and inter-

¹ www.wikipedia.com; June 2009.

organizations integration. There are also two main drivers of Innovation in the economic structure of the firm, which are the firm's size, and the second is based on the Teece/Itami¹ view of the firm as a producer of information and other intangible outcomes. For the former, the studies that have been done have shown that there are large economies of scale associated with R&D and product development expenditures. While for the latter the stress is made on the firm as developing intangible and non-tradable properties. Firms with a combination of complementary assets can increase these assets over a number of potential products. Innovating firms according to this view invest more than non-innovating ones in both R&D and advertising, several studies have shown also that larger and more horizontally and vertically integrated firms are better innovators than single-product firms. While smaller firms are more flexible and successful at taking advantage of the external effects of R&D accomplished at other organizations, laboratories and universities; this free-ride permit them to recompense for their need of scale in R&D assets. In most innovative countries almost all the pioneering companies mainly those which are specialized in biotechnology and computer for their start spin-offs from universities and research organizations and laboratories. Besides a large majority of small and medium-size software, medical technology and other high tech companies raised from entrepreneurial employees having knowledge, experience, skills, and even colleagues and clients from their ex-employers. Innovations in small firms do not necessitate so many complementary assets, this reality is right enough to drive the smaller firms being innovative while they can sell or lease their Innovations to bigger firms possessing the complementary assets to exploit as best as they can the product's potential.

Anyway, the third factor that drives Innovation of a company is the internal structure of the firm. Evidences in a great majority of researches that have been done in the domain of Innovation have shown that the organizational structure of the firm has a huge impact on the innovativeness of the firm, mainly because Innovations need such an internal environment into which information, knowledge and skills are generated and capitalized into profitable products. The most successful innovative firms are likely to be structured in ways that allow them to:

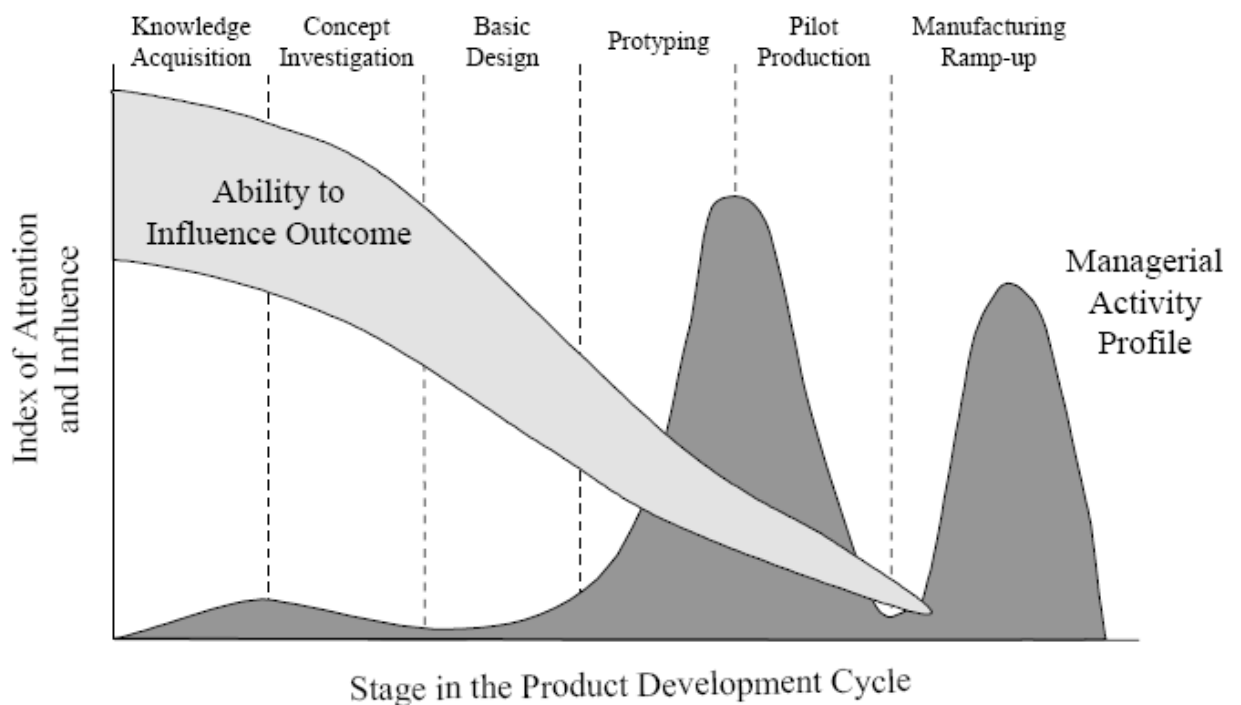
- Be near to customers to understand their needs
- Link Innovation strategy with the whole business strategy
- Remain close to the suppliers and other stakeholders to resolve problems if found, and do save time and money
- Help employees explaining and exploiting their ideas in such an easy way

¹ D. Teece, *The Multinational Corporation and the Resource Cost of International Technology Transfer*, Cambridge MA: Ballinger, 1976; H. Itami and T. Roehl, *Invisible Assets*, Cambridge MA: Harvard University Press, 1987.

- Put the best employees on new products development projects
- Learn from their mistakes and the others' mistakes as well
- Be flexible in any functional situation might be found
- Make the different department working together in such a harmonized way in order to achieve the firms' objectives.

Much of empirical evidence indicate a very common view that successful innovative firms are less than committed to, they have such an integration of Innovation strategies with corporate strategies that allow them to facilitate and insure their working processes and their cross-functional teams' activities. **Clark Wheelwright** and **Hayes**¹ provide a remarkable scheme that stresses on the relationship between the management role and its weight on new product development processes. The scheme highlights also why so many new product development projects fail to meet expectations. (See figure 8 which follows)

Figure 8: The factors that drive and create Innovation



Source: Hayes, Wheelwright and Clark²

The historical development of the firm can be one of the main drivers of Innovation, firms continuously learn to adapt to their environment more than ever because the environment is changing in every single moment then firms have to deal with all the changes happening in its environment. This was the basis of several studies in the last couple decades such as that of

¹ K. Clark, S. Wheelwright and R Hayes, *Dynamic Manufacturing: Creating the Learning Organization*, New York: Free Press, 1988.

² Idem

Henderson¹ where he has illustrated that companies succeeded through developing exceptional positions and competencies in the market place, the thing that provided them new opportunities for success and expansion.

II.3. Innovation and firm size:

The relationship between Innovation and firm size has been included and studied on the Schumpeterian works and empirical literature which relate some measures of Innovation activity to a measure of firm size, through applying it on firms from one or several countries and regions. **Scherer** (1992) declared that firm size is exogenous, and that it is clear that Innovation affects firm growth and market share and then, the firm size in period t is influenced by the innovative activity of that firm in the period $t-1$. Several factors, however affect the innovative activity, and these factors are correlated to the firm size in year t , so a regression of innovative activity on size will produce biased estimates of the size coefficient.² But we argue that the effect of the innovative activity on firm size occurs only after a gap of some years. **Cohen and Levin** (1989) confirm that *there would be found another problem with the empirical studies of the firm size and its relationship with the innovative activity, which is due to the need to control for industry effects, mainly because firm size is likely to be related to several industry factors such as technological opportunities, the industry structure and so on, and then it is so important to control for industry effects on firms to avoid taking biased estimates of firm size coefficient while using a sample covering different firm sizes from different industries*. Several other studies have focused on the same issue but each in its way, **Scherer's** influential studies for example focused mainly on R&D employment intensity which is the R&D employment relative to the total employment, on sales, and number of patents on sales both for the whole sample and for several sub-samples for particular sectors. **Kamien and Schwartz** (1982) in their survey concluded that *with an exception of the chemical sector, there was a little support for the hypothesis of a positive effect of firm size on the innovative activity*.³ **Pavitt, Robson and Townsend** (1987) have also examined the relationship between firm size and innovative output. The broad picture they present offers little support for the Schumpeterian hypothesis of a positive effect of size on Innovation.⁴

In his study about the US firms, **Schmookler** (1966) found that smaller US firms have a higher propensity to patent their Innovations than larger ones, and proposed that this may somehow explain why smaller firms account for a huge number of patents which is disproportionate to

¹ B. Henderson, the Origin of Strategy, Harvard Business Review, 67, Nov/Dec 1989, 139-143.

² Scherer F.M (1992), "Schumpeter and Plausible Capitalism", Journal of Economic Literature 30, pp. 1416-1433.

³ Kamien, M.I. and Schwartz N.L. (1982), "Market Structure and Innovation", Cambridge: Cambridge University Press.

⁴ Pavitt, K., M. Robson and J. Townsend (1987), "The Size Distribution of Innovating Firms in the UK: 1945-1983", Journal of Industrial Economics, 35, pp. 297-316.

their size and their R&D expenditures. In the other hand, these studies included both firms that perform formal R&D activities and those which do not perform any of these activities; and it's obvious that smaller firms with less than 100 employees do not perform any formal R&D activity, this fact can lead also to the same line of the Schumpeterian hypothesis. It was recognized that once the huge majority of firms that perform no formal R&D are excluded from the analysis, the relationship between the firm size and the R&D activity, or the innovative activity is weak, nonexistent or even negative.¹

Other studies such as **Acs and Audretsch's** emphasized on average innovative intensities that is the number of Innovations divided by the total number of employees found a negative relationship between firm size and Innovations or innovative activity, mainly because the number of Innovations is divided by an increasing number of employees and while the number of employees is getting higher and higher, Innovations are increasing but not with the same speed, for example we take two firms A and B, and if we propose that the firm "A" size is 10 employees, while the firm "B" size is 500 employees, and that the numbers of Innovations realized in the period "t" for the two firms are: 1 Innovation for the firm "A" and 30 for the firm "B", then we get the innovative intensity average for the firm "A" is $1/10=0.1$ while it is $30/500=0.06$ for firm "B"; from here we can find that the innovative intensity for firm A is much higher than firm B innovative intensity, even if the firm B is innovative much more than firm A. therefore, it is however, hard to compare the innovative intensities averages between firms with deferent sizes and deferent industries. So it's much better if the comparison is made within the same sample according to their size. **Acs and Audretsch** concluded also that *"there exist a deference between firms from different industries even if they have the same size, because the innovative activity relies also on the industry characteristics, so the debate was on which industry characteristics favor either small or large firms"*.²

Several studies that emphasized on the relationship between the firm size and R&D intensity such as **Bound et al** (1984) study, where they found a U relationship between the two variables (the R&D intensity first decreased and then increased with size) it means that both small and large firms were more R&D intensive than medium-sized firms. The same Authors took the fact that many firms do not report their R&D will bias results based only on firms which do. And their findings through using Ordinary Least Squares (OLS) regression were not different in both cases (when they included firms which report their R&D, and when they excluded them from

¹ Schmookler, J. (1972), "The Size of Firm and the Growth of Knowledge", in J. Schmookler, Patents, Innovation and Economic Change, Cambridge, Mass.: Harvard University Press.

² Acs, Z.J. and Audretsch D.B. (1990), "Innovation and Small Firms", Cambridge, Mass.: MIT Press.

the sample), and non linear econometric techniques were applied in an attempt to correct for possible selectivity bias.

Cohen et al. (1987) also ran OLS regressions of R&D intensity on both firm and business unit size for a sub-sample of R&D performing business units, using either fixed effects or variables related to appropriability conditions and technological opportunity to control for industry characteristics. Recognising the possibility of selectivity bias in samples excluding business units not engaged in R&D, they also analysed the whole sample using Tobit techniques. On the whole, neither size variable had a statistically significant effect on R&D intensity when a very small number of outliers, namely seven very large firms with very high reported R&D intensity relative to their size, were removed.

Appropriability and technological opportunity at the industry level explained much of the variance in R&D intensity between firms. On the other hand, a threshold effect was identified, using a probit model to explain the decision of the business unit to do R&D: the size of the business unit, but not the overall size of the firm, had a positive and significant effect on the probability of conducting R&D. Finally, the authors also found that the exclusion of business units not engaged in R&D resulted in a modest upward bias in the (typically insignificant) firm size coefficient, i.e. the effect of firm size on R&D intensity was overstated in the OLS regressions. However, since the qualitative results were identical in the two specifications, Cohen et al (1987), they also concluded that selectivity bias is probably not a major problem in studies of the firm size-R&D intensity relationship.¹

Finally, **Patel** and **Pavitt** (1992) examined the relationships between firm size and R&D expenditure, on the one hand, and firm size and number of US patents, on the other, and they found for a great majority of those firms increases in R&D expenditure with firm size were not significantly different from proportional, while in some particular sectors such as chemicals, mining and motor vehicles they were more than proportional.²

We can see that there exist several limitations in the studies that emphasized on the relationship between firm size and the innovative activity such as the problems with measuring innovative activity, the potential endogeneity of firm size, the difficulty to control properly for industry effects, the specific mechanisms, such as scale economies, financial constraints, appropriability conditions etc, that presumably relate Innovation to firm size, and the underreporting of R&D by small firms. **Cohen** and **Levin** (1989) argue that *“a great majority of the literature paid attention to*

¹ Cohen, W.M., R.C. Levin and D.C. Mowery (1987), "Firm Size and R&D Intensity: A Re-examination", *Journal of Industrial Economics*, 35, pp. 543-563. cited in G. Symeonidis, (1996) "Innovation, firm size and market structure: Schumpeterian hypotheses and some new themes" economics department, working papers no. 161, the OECD; Paris, France, p 10.

² Patel. P. and K. Pavitt (1992), "The Innovative Performance of the World's Largest Firms: Some New Evidence", *Economics of Innovation and New Technology*, 2, pp. 91-102.

*firm size as a main characteristic that determines the innovative activity, while only some of the studies highlighted some firm specific characteristics other than size”.*¹

In his study, **Symeonidis** (1996a) summarized that “*what is then the compromise, if any, on the relationship between firm size and innovative activity?*”

*First, the large majority of very small firms do not engage in R&D, although the extent to which some small firms do informal R&D is difficult to assess. Second, above a certain threshold firm size, R&D seems to rise more or less proportionally, on the whole, with firm size, although there are variations of this pattern across industries, time periods and countries. Third, the evidence on the relationship between innovative output and size is inconclusive”; most authors would probably agree that innovative output tends to rise less than proportionately with firm size, although other patterns have also been suggested for particular industries, periods or countries. Fourth, smaller firms seem to produce more Innovations or obtain more patents relative to their formal R&D spending than larger firms.*² But we believe also that more attention must be paid for some other characteristics such as technological opportunity, strategic interaction, the characteristics of demand, and even chance play an important role to enhance the innovative activity within the firm, either if it’s a large or a small firm.

II.4. Innovation and market structure

In the literature of market structure and Innovation, market structure is defined as the representation of brand positions in an attribute space (Elrod and Keane 1995)³. Often, the structure of markets is inferred from the substitution patterns evidenced by own- and cross-price elasticities. Products with higher cross-price elasticities are more substitutable and thus more similar, **Bucklin, Russell, and Srinivasan** (1998)⁴ show how switching matrices and elasticities correspond; we use the latter to infer structure. The economics of market structure and Innovation involves almost all the difficulties excluded from the standard analysis of competitive equilibrium, externalities, public goods, uncertainty, and non-price competition. Thus to provide a comprehensive economic theory of the relationship between market structure and Innovation, one must try to resolve these difficulties oneself or await their resolution by others. There is also the difficulty of the absence of a complete theory of market structure and Innovation.⁵ Product Innovation is endemic among consumer packaged goods firms and is an

¹ Cohen, W.M. and R.C. Levin (1989), "Empirical Studies of Innovation and Market Structure", in R. Schmalensee and R.D. Willig (eds), Handbook of Industrial Organization, Vol. II, Amsterdam: North-Holland.

² G. Symeonidis, (1996) "Innovation, firm size and market structure: Schumpeterian hypotheses and some new themes" economics department, working papers no. 161, the OECD; Paris, France, p 11.

³ Elrod, Terry and Michael P. Keane (1995), "A Factor-Analytic Probit Model for Representing the Market Structure in Panel Data," Journal of Marketing Research, 32 (February), 1–16.

⁴ Bucklin, Randolph E., Sunil Gupta, and S. Siddharth (1998), "Determining Segmentation in Sales Response Across Consumer Purchase Behaviors," Journal of Marketing Research, 35 (May), 189–97.

⁵ Morton I. Kamien, Nancy Lou Schwartz (1982), "Market structure and Innovation", Cambridge surveys of economic literatures, Cambridge. ISBN 0 521 22190 0.

integral component of their marketing strategy. As Innovations affect markets, there is a pressing need to develop market response models that can adapt to such changes.

It's obvious that market structure is affected by the Innovation activity, so the relationship between market structure and Innovation is not a simple one way causal relationship; in fact, both variables are endogenously included in such a complex system of so many other interactive variables. The literature of the relationship between market structure and Innovation shows that many authors in this domain tried to analyse the relationship through using single equation models, and some others used estimated simultaneous equation systems in which both Innovation activity and market structure are treated simply as endogenous variables. A number of studies have controlled for technological opportunity, appropriability conditions, or both. One of the opinions most frequently put forward to rationalise the hypothesis of a positive effect of market power on Innovation is that firms with a higher market power can easily benefit from their Innovation outcomes. Suppose now that the inclusion of a measure of appropriability among the explanatory variables in a regression of innovative activity on concentration reduces significantly the coefficient and the t-statistic on concentration. It would be hard to interpret such a result. For instance, this might indicate that market power matters for Innovation and the effect works through appropriability rather than the ability to finance R&D. Alternatively, it might indicate that concentration does not matter, as a correlation between concentration and appropriability does not necessarily imply a causal relationship between these variables.¹ Product Innovation is endemic among consumer packaged goods firms and is an integral component of their marketing strategy. More than 16,000 new products appear annually in groceries and drugstores (Kotler 2000). Thus, it is imperative to develop marketing models that adapt well to these changes in the marketing environment. Accordingly, we offer a concept to deal with such nonstationary market environments, though our concept can readily be applied to other nonstationary environments. These include changes in firms' promotional strategy, in the marketing environment, in consumer tastes, in the composition of firms in the market, in regulatory and economic factors, and in the environment.

Despite the importance of the effect of product Innovation, econometric analyses of the effects of Innovations on market structure remain sparse compared with extant econometric work regarding the effect of advertising and promotions on market structure and brand differentiation (Boulding, Lee, and Staelin 1994; Kaul and Wittink 1995).

¹ G. Symeonidis, (1996) "Innovation, firm size and market structure: Schumpeterian hypotheses and some new themes" economics department, working papers no. 161, the OECD, Paris, France.

Scherer (1967)¹ also somehow supported the Schumpeterian hypothesis when he found that the effect of concentration on patents was not statistically important and that the coefficient on concentration was positive and significant in some regressions and positive but not significant in others even though there was some weak evidence that the relationship is likely to break down at higher levels of concentration. While other authors failed to provide any support for the Schumpeterian hypothesis mainly because the number of patents rather than R&D intensity was used as the dependent variable. Many studies have attempted to analyse whether the R&D concentration relationship depends on other industry-level variables such as **Comanor** (1967)², **Shrieves** (1978)³.

Some more recent studies such as Levin's et al., used two-stage least squares in an effort to control for the endogeneity of concentration, found that while the inverted-U relationship persevered when dummy variables at the sector level were introduced, it clearly broke down in the R&D equation when a set of variables intended to capture inter-industry differences in appropriability and technological opportunity were included among the regressors. In the innovative output equation, the inclusion of

appropriability and technological opportunity variables resulted in a positive and significant at the 10% level coefficient on concentration and an insignificant coefficient on its square.⁴

Geroski (1990) used six different measures of market power in his analysis of the effect of market power on the number of Innovations in 73 industries in the UK, because he realized that the impact of market power on Innovation cannot be measured and captured by only one variable or two, his six variables were namely: the extent of market penetration by entrants, the market share of imports, the relative number of small firms, the within period percentage change in concentration, the market share of exiting firms and, finally, the concentration ratio. In an attempt to distinguish the effects, **Geroski** included among the regressors a proxy for expected profitability. He estimated the model using both ordinary least squares and two-stage least squares, even though there was little evidence of endogeneity of the market power variables. When fixed industry effects were not included, the coefficient on the expected profitability proxy was positive and significant, while the coefficient on concentration was positive but insignificant. **Geroski** concluded that although the indirect effect was positive, the

¹ Scherer, F.M. (1967), "Market Structure and the Employment of Scientists and Engineers", *American Economic Review*, 57, pp. 524-531.

² Comanor, W.S. (1967), "Market Structure, Product Differentiation, and Industrial Research", *Quarterly Journal of Economics*, 81, pp. 631-657.

³ Shrieves, R. (1978), "Market Structure and Innovation: A New Perspective", *Journal of Industrial Economics*, 26, pp. 329-347.

⁴ G. Symeonidis, (1996b) "Innovation, firm size and market structure: Schumpeterian hypotheses and some new themes" OECD Economic Studies No. 27. 1996/11, Paris, France.

direct effect was negative and dominant, so that the overall effect of market power on Innovation was negative.¹

We conclude from the literature review of market structure and its relationship with Innovation that Industry characteristics such as technological opportunity explain much more of the variance in R&D intensity or Innovation than market structure. We have seen also that there is a positive relationship between R&D intensity and concentration, and between innovative output and market structure. This literature is limited and got so many criticisms concerning several points such as measurement problems that may result in systematic biases, econometric problems relating to the endogeneity of market structure, as well as methodological problems such as the use of concentration as a proxy for market power. There are also more fundamental limitations. With the exception of very few studies (e.g. Levin et al. 1985, Geroski 1990), *the literature has not attempted to examine the specific hypotheses as to why a positive, or negative, effect of market power on Innovation may exist.* Moreover, it has failed to take into account the fact that market structure, market power and Innovation are all endogenously determined within an equilibrium system where the main exogenous factors are technology, the characteristics of demand, the institutional framework and possibly chance. On the other hand, the literature does suggest that market power is not, in general, necessary for technological progress, although sometimes it may be. The next step is to try to identify some of the precise mechanisms relating market structure, market power and Innovation. Only then can the role of competition and industrial policies be fully defined.²

III. Importance of innovation

Finally in this chapter, we take as a third section the Importance of innovation in both the micro and macro-level; then we took in consideration the following points: 1) Innovation and competitive advantage, 2) Innovation and economic growth; 3) The advantages of Innovation; 4) Who profits from an Innovation and 5) Measuring Innovation.

III.1. Innovation and Competitive advantage:

There is no doubt that the development of a competitive advantage is a very important business policy issue which makes almost all firms globally in the same position and which necessitates them to work hardly to gain some profits in ways that benefit the organization and its stakeholder, this problem creates a need for policy makers all around the world to develop their

¹ Geroski, P.A. (1990), "Innovation, Technological Opportunity, and Market Structure", Oxford Economic Papers, 42, pp. 586-602.

² G. Symeonidis, (1996) "Innovation, firm size and market structure: Schumpeterian hypotheses and some new themes" economics department, working papers no. 161, the OECD; Paris, France.

economies in order to be competitive within a broader economic system, in fact, there are so many ways to gain competitive advantages (OECD 1995)¹ just like Innovation which is cited as the primary source of competitive advantage (Porter, 1990)² and central to marketing strategy (Varadarajan & Jayachandran, 1999)³. Innovation is theoretically proved to be the best way to gain a competitive advantage through using both technical (product, service) and non-technical innovations (management, marketing) in a firm's competitive strategy. Innovation is, very often, defined as a source of factors which lead to improving the productivity as well as increasing the profits of any firm, it includes so many factors of value creation, and that's why it became one of the most important ingredients for firms' competitiveness; moreover, Innovation is considered also as one of the most important factors of growth for firms and especially that it helps firms to differentiate their products and services, in order to fulfill their customers' needs and expectations. Innovation may help firms to avoid the price competitiveness through creating such a new criterion by which customers make the difference between substitute products, instead of Price. However, Innovation is one of the ways used to improve the image of any firm or product.

Nowadays, with the economic crisis, innovation seems to be the right solution and lever to escape from the current situation, it may help raising consumption again, and may renew the existing products and services, and moreover it can help improving the lives of employees and customers as well, through using the aspects of technical and non-technical innovations.

III.2. Innovation and economic growth:

Arguably, *"we understand the role played by Innovation in economic change, mainly because Innovation introduces novelty (variety) into the economic field, for the reason that without Innovation the economy will settle down in a "stationary state" with little or no growth"*⁴ (Metcalfe 1998), therefore, Innovation is essential for long-run economic growth. Furthermore Innovation tends to gather in certain fast-growing sectors, leading to structural changes in so many areas such as production, demand technologies and, ultimately, organizational and institutional changes. The capacity to be the leader in any market or business issue is central for the ability to take advantage from Innovation. Innovation also is a powerful explanatory dynamic behind dissimilarities in performance between organizations, regions and countries. Firms that succeed in Innovation growth, at the expense of their less able competitors, Innovative countries and

¹ Geroski P.A. (1995), "Innovation and competitive advantage"; Economic department working paper, OECD, Paris.

² Porter (1990) Op Cited.

³ Varadarajan, P. R. and Jayachandran, S., (1999). Marketing strategy: An assessment of the state of the field and outlook. Journal of the Academy of Marketing Science.

⁴ Metcalfe, J. S. (1998) Evolutionary Economics and Creative Destruction, London: Routledge

regions have higher productivity and income than the less-innovative ones. Countries or regions that wish to catch-up with the Innovation leaders face the challenge of increasing their own Innovation activities towards leader-levels¹. (Fagerberg .J. and Godinho .M.M. 2003).

Without a doubt, Innovation is one of the essential factors of business performance as well as economic growth. , the interactions between Innovation and success have been and are still being a central topic of a number of studies either on the micro or the macro level; Schumpeterian and Neo-Schumpeterian analyses and endogenous growth theories and studies are ones of the most interesting works in this field. Schumpeter for instance builds almost all of his studies and literature upon technological Innovation which is mainly based on **Research and Development (R&D)**, he highlighted the relationship between economic growth and Innovation. Schumpeterian and neo-Schumpeterian analyses emphasized also the role played by the public policies to support Innovation; mainly through sustain Research and Development strategies within the country.

Because of these attractive consequences, policy-makers and business owners are concerned with how to foster Innovation within their regions/countries. Nevertheless, in spite of the large amount of research in this area during the past fifty years, we know much less about why and how Innovation occurs than what it leads to. Although it is by now well established that Innovation is an organizational phenomenon, most theorizing about Innovation has traditionally looked at it from an individualistic perspective, as exemplified by **Schumpeter's** "psychological" theory of entrepreneurial behavior² (Fagerberg 2003). Likewise, most work on knowledge focuses on individuals, not organizations. Except **Nelson and Winter's** work (1982), on "*organizational memory*" and its links to practice lined the way for much subsequent work in this topic. ³ Obviously a firm does not innovate in isolation but depends on broad interaction and cooperation with its environment. For this reason numerous concepts have been introduced to enhance our understanding of this phenomenon, the majority of them including the terms "system" or "network" -Such as the concept of "national system of Innovation"-, have become popular among policy-makers. Arguably, to be really helpful in that regard, these system concepts are in need of substantial elaboration and refinement. In fact, Innovation has been studied by several communities of research with different backgrounds, which have failed to communicate more effectively with one another has impeded progress in this field. Recently, either social sciences or the public sector debate in this context is built mainly upon terms of

¹ Fagerberg .J.Godinho .M.M., 2003. "Innovation and catching-up, the handbook of Innovation", chapter 20,draft 4.

² Fagerberg, J. (2003) Schumpeter and the revival of evolutionary economics: An appraisal of the literature, Journal of Evolutionary Economics, forthcoming

³ R.R and S.G Winter (1983) « an evolutionary theory of economic change, Cambridge, Massachusetts, Harvard business press. Cited in Fagerberg Jan (2003), Innovation: a guide to the literature, Oslo.

economic sustainability considered under the integration of sustainability into social, scientific and economic systems, in order to find the solutions of the socio-ecological problems (global warmth, environmental degradation, pollution and so on) which are caused mainly because of technological Innovation. By this means, the economic orientation would be changed from growth to sustainable development. Moreover; *the current economic and social crisis invites us to discuss "sustainable Innovation" or "environmental Innovation" as a basis for a new techno-economic (and social) paradigm founded on savings of energy and resources and on the development of renewable energies. The economic analysis of the relationship between Innovation and performance should include the environmental constraint as the ultimate limit of the development of capitalism.*¹

III.3. The advantages of Innovation:

There are several advantages and gains for firms to a strategy based on Innovation, one of them is that the firm may be able to identify its environment in ways that it will understand it, and moreover to adapt to that environment, the second may be, the ability to know and define the structure of the market including the competitors', the suppliers' and clients' characteristics, firms can also define the tangible and intangible barriers to entry or expansion within the market through using some aspects of Innovation strategies. Firms can be able to enjoy the supernormal profits of the new Innovation either for the reason of the newness of market which drives to limit the effective competition to the firm's new product, or because of the basic cost and pricing advantages.

First Mover Advantages:

The initial occupant of a market segment gain some advantages which may stem from the fact that the first firm which enters to the market can gain control of resources that followers may not be able to match²In general, successful early entrants into a market profit from the advantages for themselves to the degree that they can take advantage of natural rigidities that exist in most markets. The success of the first mover is generally found to be in direct proportion to the unwillingness of customers to change their preferences and habits. According to the literature First-mover advantages arise from three primary sources: (1) technological leadership, (2) preemption of assets, and (3) buyer switching costs. Within each category there are a number of specific mechanisms.³ The first mover may have a major role in determining

¹ Uzunidis D., Innovation, growth and sustainable development: general presentation, Journal of Innovation Economics 2009/1, N° 3, p. 5-11.

² Grant, Robert M. (2003). Cases in Contemporary strategy analysis. USA, UK, Australia, Germany: Blackwell publishing, Cited in www.wikipedia.com

³ Marvin B. Lieberman and B. Montgomery.(October 1987), David; First-Mover Advantages;, Research Paper No. 969. Stanford Business School.

consumer preferences through meeting consumers' latent needs; but the first product on the market can actually shape and crystallise consumers' ideas and tastes.

The second advantage for the first mover arises from switching costs linked mainly with user learning or other forms of assets and especially for the product which require additional investments by the user to take full advantage of the new product. This kind of investments in some cases is what necessitates the users to be loyal for the first mover, because they know that to try a new product they must get further investments, nonetheless, this is not the only case because in other cases the learning or co-investment of users or consumers is less easy to make such as the satisfaction of consuming a particular brand of juice or shampoo, so users do not need that huge cost of investment in these kinds of products unlike other products and especially software and hardware or almost all high technology products, where users are not allowed to switch their first product to others because of the high costs of investments and moreover because they have used to, for example; if someone is using Microsoft Office 2003, and would switch to the 2007 versions of the same product, he/she will find it difficult because he/she got used to the previous product and one will find it too difficult to learn how to use the new one again, then several computer companies attempted to negate these switching costs by making hardware and software compatible, and a great majority of them today produce programs that read data and commands in foreign formats; allowing users to switch software products without losing their existing works and knowledge. A third major source of advantage for the prime mover arises from network effects where users depend on the choice made by other subsequent users. Early adopters can also influence the late adopter by the knowledge that the product they are using is the leading product even if it has not been their first choice for the first while. One can admire that early entrants or first movers throw obstacles in the path of any late entrants, so; new market entering is a high-risk and a high-return game generally played and won by firms which have more to gain than to lose.

III.4. Who profits from an Innovation:

According to the literature, not only the firm which innovates a new product in the market is the one which will profit from that innovation, several aspects and models can be used in ways that allow us to predict who will profit from an innovation just like the **Teece Model** which helps also to understand what firm will have higher incentives to invest in certain innovations, the creator of this model **David Teece** explained that two factors i.e. Imitability and complementary assets have a strong influence in determining who will eventually profit from an innovation. Where imitability refers to how easily competitors can copy or duplicate the

technology or process to create the same Innovation, a firm may use several barriers in ways to make it harder for other competitors copying its products or processes to protect itself from imitation e.g intellectual property rights, complex internal routines, or implicit knowledge. Complementary assets means all the assets that may help the firm succeeding in its innovative activity such as reputation, distribution channels, marketing capabilities, strategic alliances, brand name, customer relationships, business models, licensing agreements and so on...

Figure 9: The Teece Model

		Complementary Assets	
		Freely Available	Tightly Held
Imitability	High	Difficult to make profits	Holder of assets profits
	Low	Innovator profits	Highest bargaining power profits

Source : <http://Innovationzen.com/blog/2006/08/24/Innovation-management-theory-part-5/>

D. Teece from his studies concluded that *if imitability is high while complementary assets are freely available or unimportant it will be difficult to make money out of the Innovation but exceptions can be made at the very short run and especially if the competitors are still looking for the best ways to imitate the Innovation, If the imitability is relatively high and the complementary assets are tightly held and important, the holder of such assets will be the one profiting on the Innovation. If instead imitability is low the innovator will find himself in a very suitable and profitable position, when complementary assets are not controlled by other economic actors he will be able to collect most of the profits being generated. When, on the other hand, complementary assets are important and tightly held negotiation will take place, profits will be shared in proportion to bargaining power of the parts involved. That's why innovators usually rely on high-tech complementary assets, or they all the time try to invent their own complementary assets in ways that allow them to profit from their Innovations as best as they can.* The Teece model can be used not only to predict who will profit from an Innovation but also to understand what company will have higher incentives to invest in certain Innovations. By the way, when a firm invests in developing an Innovation, usually it hopes not only to create value but also to capture value. Firms usually capture value by making it difficult for others to imitate

the product Innovation (through secrecy or patents), by controlling key suppliers in the market, or by having a strong brand that builds customer loyalty. These barriers to entry also help innovators profit from their investments.

III.5. Measuring Innovation

There exist several ways to measure Innovation, but the most used measures are known as the traditional measures of Innovation which are R&D expenditures¹ and patents². Following many studies in this domain since the 1950s, R&D expenditures can be regularly collected, usually on an annual basis, in several countries, while patent data have been collected since an earlier period of the 19th century, in the case of Algeria, patent data are available electronically on the INAPI web site³; in this work we are going to discuss the measures of Innovation from a theoretical perspective while in the next chapter we will take both of them from data analysis and discussion. In this section we are going to analyse some statistics and tables which have been taken from several organizations such as the WIPO and the INAPI, in ways that allow us understanding more the stage in which Algerian Firms are, concerning inventions, patents, trademarks, and industrial property rights.

III.5.a. Innovation and Patents

As it is widely known, a patent provides protection for the invention to the owner of the patent, thereby, the invention cannot be commercially made, used, distributed or sold without the patent owner's permission, this protection is required in today's market and especially with all the emitted products and services that are found in the market, generally this protection is granted for a limited period, which is 20 years in almost all the cases, and sometimes less; in this period, only the patent owner has the rights to give permission to or licence other parties to use the invention on mutual agreed terms, he may also sell the rights to someone else, as he may give them to that new owner; for free. Once a patent expires, the protection ends and then the invention becomes available to commercial exploitation by the others, and the owner no longer holds exclusive rights to the invention. In fact Patented inventions have, in fact, pervaded every aspect of human life, from electric lighting (patents held by Edison and Swan) and plastic (patents held by Baekeland), to ballpoint pens (patents held by Biro) and microprocessors

¹ Expenditure on research and development (R&D) is a key indicator of government and private sector efforts to obtain competitive advantage in science and technology. In 2005, research and development amounted to 2.3% of GDP for the OECD as a whole. (OECD (2007), Main Science and Technology Indicators, OECD, Paris.)

² A patent is an exclusive right granted for an invention, which is a product or a process that provides, in general, a new way of doing something, or offers a new technical solution to a problem. In order to be patentable, the invention must fulfill certain conditions (source www.wipo.int)

³ <http://www.inapi.org/site/statistiques.php>

(patents held by Intel, for example) All patent owners are obliged, in return for patent protection, to publicly disclose information on their invention in order to enrich the total body of technical knowledge in the world. Such an ever-increasing body of public knowledge promotes further creativity and Innovation in others. Empirical evidence has shown that there was no relation between a country's score on this index and its economic growth. Increasing IP rights tend to be correlated with R&D spending, but it turns out the causality goes the other way: first a country starts spending more on R&D, and then later they increase IP rights strength.

In this way, patents provide not only protection for the owner but valuable information and inspiration for future generations of researchers and inventors.¹ In Algeria a patent may be granted from the INAPI (*Institut National Algérien de la Propriété Industrielle*), which first of all requires the person who asks for the patent to fill up a patent application which contains the name or the title of the invention its self, the indications of its technical field, the background and the description of the invention as well as the drawings, plans, or the diagrams to better describe the invention.

In 2006 the **INAPI** received 477 patent demands from national companies, while the whole demand for patents was 514 demands, which is really limited comparing with other countries, and even though for that raise in patents demand, from a year to another in the last decade,(see Table 3 Appendixd to this work, and which illustrates the patents' demand in Algeria since 1980) patenting is still need to accelerate further; the case was the same for trademarks demand from the INAPI office because it was only 2682 demands in September 2006; with a raise of 244 demands comparing with 2005. the same organization received 2875 trade mark demand to extend into the Algerian market from foreign companies, while the number of these demands was counted by 3665 demands, 31 patents was the number of the accepted patenting demands in 2006 by the INAPI, from the whole 477 demands, sometimes the rejection of these demands was because of the missing files or the uselessness of the invention its self, while some of theme was because of the policy of the INAPI, and the wasted time concerning each of the preparation and the patents' demands studies, and so on...through some interviews with local firms from which have already asked for their patents as well as the local commerce chamber, there was obviously a huge gap in time between the demands and the acceptance/rejection of the files, which is counted as a main problem and obstacle for firms to get the industrial property rights of their invention. (See table 1, Appendix). Foreign companies have asked for patents in Algeria through the INAPI office, such as France who was and still is the leading country in trademarks

¹ www.wipo.int; March 2010.

registration in the INAPI office in 2006 the most by the number of 559 registrations and 752 renewals, while Germany came second with 338 registrations and 567 renewals, Italy was third by 254 registrations and 360 renewals, Switzerland was fourth by 198 registrations and 295 renewals and china came fifth by the number of 193 registrations and 13 renewals, the sixth place was for Spain by 103 registrations and 123 renewals; other countries have registered less numbers of trade marks in the Algerian office of patents and industrial property rights, including morocco with 54 registrations, and Egypt by 15 registrations, other countries are considered to be less interested by the Algerian market and some others do not have any interests to the Algerian patents and patents' offices. (See table 4; in Appendix)

The next Table (Table 1) illustrates the patents' demands, registrations and renewals for national trade marks in the INAPI office in the first three trimesters of 2006(the period between 01/01/06 and 30/09/06) concerning national and foreign companies, this table shows that 554 demands was accepted from the number of 1664 demands of trade marks from national companies, while 546 trade mark was registered from 1018 foreign demands, while only 128 national trade mark have renewed their patents in that period in addition to 487 foreign ones have been renewed in the same period of 2006. In 2007, the WIPO received 84 Patent applications from the Algerian office of patents, while it was 58 applications only in 2006 and in 2008 the number was planned to be extended but data are not available neither at the WIPO's nor at the INAPI's official web sites. It was 59 in 2005 and 58 applications in 2004. (See the WIPO Statistics Database, December 2009)¹

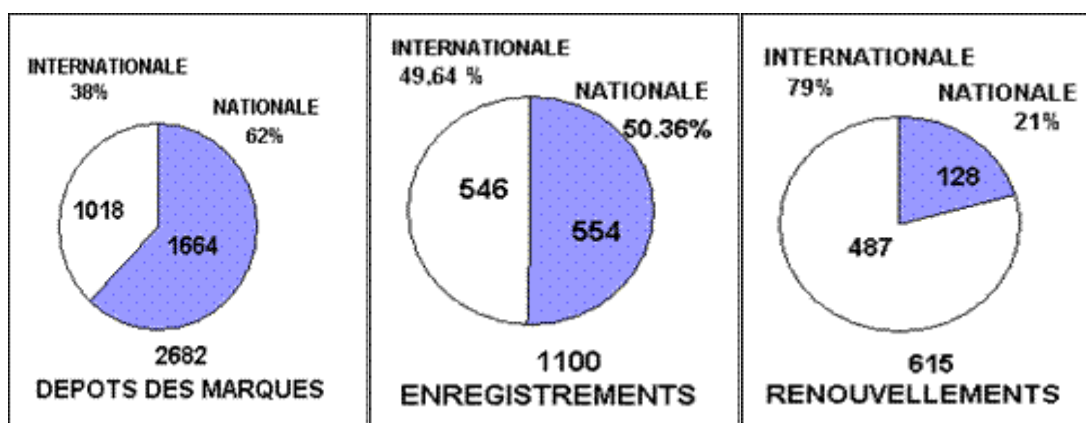
Table 6: Deposit, renewals and national brands registration (between 01/01/06 to 30/09/06):

Country of Origin	Deposit	Registrartions	Renewals
Nationales	1664	554	128
Etrangers	1018	546	487
Total	2682	1100	615

Source: the INAPI web site, June 2010.

Figure 10: Deposit, renewals and national brands registration (between 01/01/06 to 30/09/06):

¹ www.WIPO.org



Source: the INAPI web site; June 2010.

Table 7 which is below demonstrate some statistics of patents taken from the INAPI offices, and web site, it illustrates the number of Patents delivered for national firms by the INAPI, and the number of patents demanded in the period between 1988 and 2007, we have asked the INAPI offices for recent statistics of this kind, but each time we called they kept saying that it is still confidential and that they cannot offer us such information, because they do not concern the INAPI itself but also the local firms which have asked about the patents of their products and services, as well as the ministry of the industry, anyway; was 214 in the date of 2007, while it was 590 patents in 2006 and 550 in 2005, with the exception of the drop of the number of patents in 2007, comparing with the previous year, patents number was raising by time in the last decade, while it was not steady in the 1990s; mainly because of the social, political and economic situations in that period. Algeria now is in the right way to strengthen the patents policies within the local market, with so many laws and texts through which companies will be able and sometimes obliged to register their inventions and marks.

Table 7: Statistics of the Algerian patents until 31/12/2007

Year	Total of deposits	Certificats	Deposits of nonresidents		National Deposits	Delivered Patents	Actual Patents
			Via a National way	PCT			
1988	206	01	201	/	05	/	00
1989	204	00	200	/	04	/	10
1990	235	00	229	/	06	/	12
1991	176	01	170	/	06	/	11
1992	174	00	164	/	10	/	14
1993	146	01	138	/	08	/	07
1994	145	00	118	/	27	/	16
1995	162	00	134	/	28	/	15
1996	200	02	150	/	50	91	32
1997	241	01	207	/	34	121	52
1998	309	03	267	/	42	184	106

1999	284	06	248	/	36	143	96
2000	159	02	127	/	32	78	42
2001	147	07	38	56	51	69	61
2002	334	04	41	250	43	119	167
2003	328	02	16	280	30	250	200
2004	393	01	30	304	58	290	322
2005	514	01	34	431	59	550	498
2006	669	04	47	564	58	590	669
2007	852	03	31	734	84	214	852
Total	5876	39	2590	2619	671	2699	3553

Source: the INAPI web site.

Comparing with other African countries the Algerian Resident patent filings per \$billion of Gross Domestic Product in the period between 1995 and 2007 seem to be very much low than these of the other countries in the table even the countries which have the same and even a lower income, such as Zambia, Kenya, Madagascar, and even Tunisia, the less than 0.35 billion from the GDP is considered to be low comparing with Egypt which gives more than 1.35 billion for the same year (2007), while Tunisia gave 0.87 \$Billion in 2005 for resident patent filings, that may be because of the reason that in Algeria this kind of expenditures is financed by public sector only, which is the case in Saudi Arabia, and Morocco.

Table 8: Resident patent filings per \$billion Gross Domestic Product (1995-2007)

Year Country of Origin	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Algeria	0,18	0,30	0,20	0,24	0,20	0,17	0,27	0,22	0,14	0,26	0,25	0,24	0,34
Egypt	1,88	2,21		1,97	2,02	1,91	1,60	2,11	1,61	1,20	1,29		1,35
Kenya		0,40	0,58	0,69	0,63							0,74	
Madagascar	1,83	0,60			0,68	0,50		0,31	0,21	1,08		0,25	
Malawi	0,15	0,28	0,27	0,26	0,12	0,37							
Saudi Arabia	0,08	0,07	0,15	0,12	0,19	0,19	0,11	0,15	0,13	0,17	0,24	0,24	0,24
Tunisia	0,78	1,06	0,92	0,81	1,35	0,90	0,40	0,81	0,60	0,74	0,87		
Zambia	0,43	0,60			0,48		0,53						

Source: WIPO Statistics Database and World Bank (World Development Indicators), June 2009

Note: Gross Domestic Product (GDP) data are in billions of US dollars, based on 2005 purchasing power parities.

III.5.b. Innovation and R&d :

The theoretical background of Innovation, and Research and development (R&D) considers R&D as a main driver of Innovation performance and is then a determinant of the Innovation level of any country, R&D comprise creative work undertaken on a systematic basis in order to

increase the stock of knowledge, including knowledge of man, culture and society, and the use of this stock of knowledge to devise new applications. R&D is a term covering three activities: basic research, applied research, and experimental development. Basic research is experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying foundation of phenomena and observable facts, without any particular application or use in view. Applied research is also original investigation undertaken in order to acquire new knowledge. It is, however, directed primarily towards a specific practical aim or objective. Experimental development is systematic work, drawing on existing knowledge gained from research and/or practical experience, which is directed to producing new materials, products or devices, to installing new processes, systems and services, or to improving substantially those already produced or installed. The main aggregate used for international comparisons is gross domestic expenditure on R&D (GERD). This consists of the total expenditure (current and capital) on R&D by all resident companies, research institutes, university and government laboratories, etc. It excludes R&D expenditures financed by domestic firms but performed abroad.¹ In our third chapter of this work, we will discuss in a higher level, R&D impact on Innovation, relating it with national Innovation systems (NISs) GERD, and number of researchers... We will discuss this part later in this work with more details, once we will discuss the NISs of some countries, through making a comparative analysis between those countries, such as France, China, Japan, the US...

III.5.c. Measuring Innovation in North African Countries

It is widely accepted that there is a huge gap between the north and south, in all areas and domains including social, economic, organizational, and so on, this gap concerns also the R&D and Innovation sector between the north and the south. The performance of research and Innovation of firms and universities from the North bank is very high and dynamic compared to the other bank. North African countries such as Algeria, Tunisia morocco and Libia, are considered to be included in the southern bank, mainly because they are all situated in the south of the Mediterranean Sea, and moreover because they are all African countries, and as it has been illustrated in the previous part of this work the portion of the Arab countries does not exceed 0.5% from the global scientific publications (all disciplines included), and the GERD does not exceed the average of 1% in almost all the countries, if not pretty much less than that; GERD can show the real picture of these countries in research which is very limited and does not really contribute in the accumulation of knowledge and enhancement of the productive

¹ OECD (2007), Main Science and Technology Indicators, OECD, Paris.

system. In Algeria, for instance, the GERD has been improving by time in the last decade, but even though that enhancement it (GERD) represented only 0.35% from the GDP in 2004; and research is almost 98% funded from public organizations but there are not any tools or programs to make it concrete and valuable, in Algeria also The creation of innovating firms is exclusively the mission of large enterprises such as Sonatrach, Sonelgaz, Electricité d'Algérie, SAIDAL.. (Khalfaoui, 2006)¹. While for Tunisia and Morocco, there is a little light concerning GERD and the existence of programs to motivate R&D and Innovation, but research is still largely financed by public sectors. Moreover; these three countries possess only few patents in the European offices of patent while the patent applications of these three countries are totally absent in the American Office of patent (OST 2006)². Anyway, the integration of Innovation and R&D activities in the private sector in Maghreb countries seems to be limited mainly for the reason that these activities are not a part of the business proprieties of local firms in these countries owing to the low rates of technological intensity of these countries, with slight differences between sectors as well as between countries. For instance, the major orientation of scientific and technological Innovation policy of the Tunisian governments consists of encouraging enterprises and industrial support institutions to integrate Innovation, technology transfer and R&D in their strategies.³

During the last decade, trans-national firms were considered as the main driver of R&D activities globalization, the R&D activities in these firms represents almost the half of the global R&D activities and expenditures, and more than 2/3 of firms R&D activities.⁴ By the way, and as we will see in the third chapter of this work with more details, R&D expenditures, as well as R&D activities have emerged in the last decade only to reach uncourageous rates in some emerging countries, mainly situated in Asia such as in China, and India, while it is still limited of Arab countries which constitute around 3.5% of world GDP and more than 4% of world population, but Arab countries consume around only 0.4% of the Gross Domestic Expenditure on R&D (GERD) and then The Arab world is not investing enough of its economic resources in technology, and was ranked last - even lower than African countries. By the way, a most recent statistics reveal that 89-97% of R&D expenditure in the Arab world is funded by the public sector. By contrast, more than 50% of R&D expenditure in developed economies is funded by

¹ Khalfaoui, Ferfara Y. and Ouchalal H. (2006) Accès aux technologies et pratiques de la R&D dans les entreprises publiques algériennes, Les cahiers du CREAD, Algiers, Algeria. Cited In El Elj M. ; (2009), "R&D and Innovation Empirical Analysis for Tunisian Firms"; Munich Personal RePEc Archive, Munich, Germany

² OST (2006), les systèmes nationaux de recherche et d'Innovation et leurs relations avec la France : Les pays du Maghreb. Cited in El Elj M.;Idem

³ El Elj M.;Idem ; p 7.

⁴ UNCTAD (2005), Rapport du l'Investissement dans le Monde : Les sociétés transnationales et l'internationalisation de la recherche-développement. El Elj M.;Idem.

the private sector. (Abdallah Alnajjar, 2002)¹. More than few firms generally in Arab countries and particularly in North African countries do not have an R&D account in their accounting system. Even if they have already taken R&D activities but their R&D expenditures are null. These activities are then funded by another budget². Arab countries has become a destination for some firms that aim to invest in R&D activities in so many sectors and not only strategic sectors as the case of the last few decades, and by the way, one of the main problems within Maghreb countries which limits R&D activities and then innovative activities for firms is somehow the high rates of unemployment of well educated and skilled people, and sometimes the time gap between the degree/study accomplishment dates and the dates of being employed, because it works to limit the possibilities to enhance the skills and knowledge gathered and improved at universities and educative centres, and it also bound the knowledge value of those people; which in one way or another will affect the innovative capacity of the firms; as well as product launching either within or outside the local markets of these countries; Thereby, the value of the R&D activity of the firm is directly related to the core competencies and knowledge of this firm as well as to its efficient innovative processes. Baldwin & Hanel, (2003)³ and Duget, (2000)⁴, have proven that the firms which have higher rates of expenditures on R&D activities have the most competitive advantages in the radical Innovation and claim more inventions rights. In fact, there exist so many factors which have been proven to have a positive effect on the Innovation process of firms just like; Market structure, firm size, R&D expenditures, R&D intensity and so on...

The increasing integration into the world economy raises new challenges for the Algerian productive sector, particularly the industrial sector which must face increased competition and whose consolidation largely depends on greater business competitiveness. If its transformation is to succeed, the Algerian productive sector must not only be capable of facing competition from imports but also be capable of exporting.

These challenges will require Algerian companies to:

1. *adopt modern management systems that channel a will for constant change and whose objectives are based on Innovation rather than maintaining established positions;*
2. *integrate a quality approach that enables them to offer products capable of competing with imports and capturing export markets;*

¹ Alnajjar A., Networking the Arab Scientific Community Can Bring Change to the Arab Countries; Toward Harvesting Outcome of Arab Education System, Arab Science & Technology Foundation (ASTF), 2002.

² El Elj M.;Op cit. p 13

³ Baldwin, J.R. et Hanel, P. (2003) Innovation and Knowledge Creation in an Open Economy, Canadian Industry and International Implications, Cambridge, U.K.: Cambridge University Press. Cited in El Elj M.;Idem

⁴ Duguet E ,(2000) Knowledge diffusion, technological Innovation and TFP growth at the firm level: evidence from French manufacturing , Eureka-CNRS UMR 8594. Cited in In El Elj M.;Idem

3. *take advantage of the opportunities offered by information and communication technologies;*
4. *possess structures capable of supporting their desire to meet quality standards, and technical aspects and incorporation issues relating to Innovation.*

Conclusion:

Firm's innovativeness relies on several characteristics of the firm itself such as the firm size, employees skilfulness, internal activities, R&D activity, and R&D intensity as well as other environmental features and factors that can determine the level of innovativeness and Innovation performance of the firm, thereby any business owner or manager or even a simple employee must understand at least few of these concepts and how each of them works to foster or depress the Innovation process, we have given a simple literature review of Innovation in ways to help readers collecting even a smallest amount of knowledge about this subject. In addition to technological and financial resources, Innovation requires further knowledge and resources such as expert know-how in a lot of areas such as management, production, the Innovation process, intellectual property rights, marketing, and cooperation skills and so on. The literature of Innovation is more concerned by the Innovation's borders in the developed countries than the adaptation capacity in the developing countries, this literature shows that Innovation is becoming (not only in developed countries but also in developing ones such as the north African ones) one of the most important assets for corporations, but the case is a little different between the north and the south, the case of north African countries including Algeria shows us that Innovative activities are almost totally held by governments and public sectors in these countries while in developed countries those activities rely to a massive part on private sectors contribution. The innovative and research activities in north African countries are still late but they have been some changes and developments in the last decade, which has brought so much development to the region, but the governments in these countries are still hoping for

more development concerning Innovation activities and thus they are still gathering the local efforts to realize their planned goals in the middle/long terms.

CHAPTER 2: MARKETING AND ITS USE IN INNOVATION
ACTIVITIES

Introduction

IV. Marketing: a conceptual background

5. Marketing definition
6. Marketing Activity
7. Product Lifecycle
8. Definition of Customer

V. Relationship between innovation and customer satisfaction

7. Studying Consumer buyer behavior types and factors
8. Importance of Customer Information
9. Customer Experience Cycle
10. Customer Satisfaction
11. The relationship between customer satisfaction and customer loyalty
12. Market Orientation and Innovation

VI. Interaction between marketing and innovation

5. Interdepartmental integration
6. Marketing and R&D linkage during NPD projects
7. The relationship between Marketing and Innovation
8. Marketing barriers to Innovation

Conclusion

Introduction

During years and years almost all companies were essentially based upon their products to obtain new parts of market to attract more customers, and to grow their number of sales up, so market was simply a gathering place where people with a supply of items or capacity to perform a service could meet with those who might desire the items or services, perhaps at a pre-arranged time, such meetings represented many aspects of today's marketing methods, although sometimes in an informal way, so a market contains sellers and buyers whom sought to understand each other's needs, capacities, and psychology, all with the goal of getting the exchange of items or services to take place, and for that the organization first determines what their potential customers desires are; and then builds the product or service that will be accepted on the market; but this idea is still changing especially after the rise of Agriculture that certainly influenced markets, like that we get in today's competitive market, which always seems intensive, rigorous, and aggressive today more than yesterday and tomorrow as more as how much is today; this market environment is still changing day after day without a rhythm, and that because of some reasons just like:

- The technological revolution.
- The Diversification and the multiplication of communication and distribution channels.
- The privatisation which transfers some activities traditionally hold by the state to private interests.
- The Superabundance of information, which is the start point of the decision making.

The enterprises cross one stage of reorientation strategic; the base of this change is the passage of marketing from an orientation of products to a relational orientation. Thus, they build up their competencies inside the customer relationship construction on long way.

On this chapter, we will try to display and show some answers of some questions: e.g. what is marketing? What is the role of marketing in the organization? What is interdepartmental integration? Do Market Orientation and interdepartmental integration affect Innovation?

In our first reading to those questions and so many others, and without thinking for a long while, we will find cogent and convincing answers about them, but the most important that there exist as many answers as there do brains, which are thinking on those questions.

We could enter to our studies on this research without get definitions of our terms, values and mission but we can fail on this research only because of that, firms must also

identify their mission and main goals before and during their activity, and obviously it has been widely accepted that customers are the only boss for any business, and is the main source of revenue for any firm, thereby firms with all their staff must know their customers' needs and behaviour in order to fulfill those needs which yields to customer loyalty through using a series of business actions and cross-functional business systems. Customer Relationship Management is one of them, because if the relationship with customers is well managed it might be the only durable source for benefits for the business and stakeholders. This can hold true in business and studies as how it is on life. If we are not clear on our values and mission it is easy to flounder and finally our business could die. Anyway, in this chapter we are going to adopt some authors' points of view such as **Kahn** and **Mentzer** mainly for the reason that they both (and especially Kahn) have added a deep literature to the field of interdepartmental integration, as well as Marketing-Innovation linkages; However, by being very clear on our values and our mission, we are assured more of a chance for our business to grow and thrive, so what is marketing?

I. Marketing: a conceptual background

As to know more about Marketing, we had to give a conceptual background about it, which led us to divide this section into four sub-titles which are: 1) Marketing definition; 2) Marketing Activity; 3) Product Lifecycle; 4) Definition of Customer.

I.1. Marketing definition

The practice of marketing is reasonably ancient. That is from going back to the Greek philosophers such as **Plato** and **Aristotle**, medieval church fathers such as **St. Thomas** or **Martin Luther**, and later classical economists such as **Adam Smith** and **David Ricardo** have reflected on marketing behaviour. However, *the formal concept of marketing emerged only 100 years ago at the beginning of the twentieth century; on the following paragraphs we will see some definitions of marketing concept, which has been added by some marketers, economist and sociologists... Indeed, in 1901 the Report of the Industrial Commission on the Distribution of smallholding and farm Products was first published, and today that seminal work is considered the first book on general marketing.*¹

*The definition of the word "Marketing" can be founded within its origins; it means "putting on the market." Therefore, the purpose of marketing is to act in such a way that a company places on the market products that correspond to demand and satisfy the needs and wants of customers at an acceptable return*², but economically Marketing is one of the terms in academia that does not have one commonly agreed upon definition, as that we can say that there are many definitions of marketing, and there is no agreed definition of marketing concept, this term which was defined by certain writers, organizations, and associations, just like what has done in 1937 by the newly born "**American marketing association**" (A.M.A), which declared that: *"Marketing consists of those activities involved in the flow of goods and services from the point of production to the point of consumption."*³

There is also the definition that the Chartered Institute of Marketing used it to define marketing, and it is which follows: 'Marketing is the management process that identifies, anticipates and satisfies customer requirements profitably'. **Palmer** also defines marketing by saying that *Marketing is essentially about marshalling the resources of an organization so that they meet the changing needs of the customer on whom the organization depends.*⁴

¹ : http://newsroom.cisco.com/dlls/innovators/mario_mazzola_qa.html, November 2003.

² Van Aswegen B. J; 2007, "The Impact Of Six Sigma On The Marketing Process In The South African Renal Healthcare Industry" Masters degree dissertation; Pretoria.

³ Milestones of Marketing by George Burton Hotchkiss, The MacMillan Company, New York, 1938, page VII.

⁴ www.marketingteacher.com/Lessons/lesson_what_is_marketing.htm, May, 2006.

Philip Kotler in his earlier books defined marketing simply as: "*human activity directed at satisfying needs and wants through exchange processes*". Later the same Author, **Philip Kotler** stated that "*Marketing is the social process by which individuals and groups obtain what they need and want through creating and exchanging products and value with others*"

Adding to **Kotler's and Norri's** definitions, the Chartered Institute of Marketing's (CIM) definition claims marketing to be the "*...management process of anticipating, identifying and satisfying customer requirements profitably*". Thus, operative marketing involves the processes of market research, market segmentation, new product development, product lifecycle management, pricing, channel management as well as promotion.

The **AMA** has since amended its first definition of Marketing to: "*Marketing is an organizational function and a set of processes for creating, communicating, and delivering value to customers and for managing customer relationships in ways that benefit the organization and its stakeholders.*"¹

Bernard Blanche has simply declared that "*marketing is a multiple function*"². The following description is more detailed definition has been developed by the **American Marketing Organization** (AMA): "*Marketing is the process of planning and executing the conception, pricing, promotion, and distribution of ideas, goods, and services to create exchanges that satisfy individual and organizational goals*".³ In 1990, **Harvard Business Review** defined Marketing by saying that "*Marketing focuses on making the product available at the right place, at the right time, and at a price that is acceptable to customers*".⁴

A lot of economists have declared that Marketing is a philosophy reverses the traditional perspective toward the company, its needs, and its production capacities. Marketing considers its main task to be "*determining the needs and wants of the appropriate markets and to profitably produce the desired product or services by being more efficient than the competition*".⁵

Bartles is one of the economists whom have tried to define marketing as a philosophy and an art hence he said that "*the marketing concept is a philosophy. It makes the customer, and the satisfaction of his or her needs, the focal point of all business activities. It is driven by senior managers, passionate about delighting their customers.* **Drucker** said also that "*Marketing is not only much broader than selling, it is not a specialized activity as all it encompasses the entire business. It is the*

¹ Dictionary of Marketing Terms" from <http://www.marketingpower.com>:Last accessed 9 February 2007.

² Dictionary of Marketing Terms" from [marketingpower.com](http://www.marketingpower.com) Last accessed, 9 February 2007.

³ Chesbrough, Open Innovation: The New Imperative for Creating and Profiting from Technology, Boston, MA: Harvard Business School Press, 2003.

⁴ Nevers, M., G. Summe, and B. Uttel, "Commercializing Technology: What the Best Companies Do," Harvard Business Review, Vol. 68, Issue 3, May/June 1990, pp. 154–164.

⁵ Dell'Osso, F., "Defending a Dominant Position in a Technology Led, Environment," Business Strategy Review, Vol. 1, Issue 2, 1990, pp. 77.

*whole business seen from the point of view of the final result, that is, from the customer's point of view. Concern and responsibility for marketing must therefore permeate all areas of the enterprise"*¹

"The achievement of corporate goals through meeting and exceeding customer needs better than the competition". Is the definition that **Jobber** identifies marketing by.

As well there is **Cohen's** definition of marketing, which is "*Implementation of the marketing concept [in 1990's] requires attention to three basic elements of the marketing concept. These are Customer orientation; an organization to implement a customer orientation; Long-range customer and societal welfare"*.²

There probably exist as many definitions as there do speakers on the subject but **Al Ries and Jack Trout** get the prize for succinctness with their quip that marketing is simply "a war" between competitors. There are some important and vital elements for any firm on its marketing process, those elements which contained as follows:

- Marketing focuses on the satisfaction of customer needs, wants and requirements;
- The philosophy of marketing needs to be owned by everyone from within the organization;
- Future needs have to be identified and anticipated;
- There is normally a focus upon profitability, especially in the corporate sector. However, as public sector organizations and not-for-profit organizations adopt the concept of marketing, this need is not always the case.
- More recent definitions recognize the influence of marketing upon society.

On this case of identify what the meaning of marketing is, we need to ask an important question, which maybe will tell us about the role of marketing in organizations; so Is there a Role for Marketing?

In fact we have to ask this question, just to be realistic on our research and all our studies; however, the high proportion of failure at the time of the launch of a product (80%) is a living proof that there is a real need for Marketing. But this need must be accompanied by a deep change in concepts, so that the "societal" factors that we exposed earlier can be taken into account, and the negative perception of Marketing can be fought. At the same time, it has to address that need for immediate return on investment, in order to preserve its credibility. Marketing needs to be re-marketed in a manner of speaking, and it needs to be positioned against the rest of Management techniques, by the way we need every one of Different Kind of Marketing to make our whole business succeeds, organizations will then have a growing need for marketing. But the evolution of our society on the one hand, and the past experiences on the

¹ www.marketingteacher.com/Lessons/lesson_what_is_marketing.htm, May, 2006.

² OP CIT.

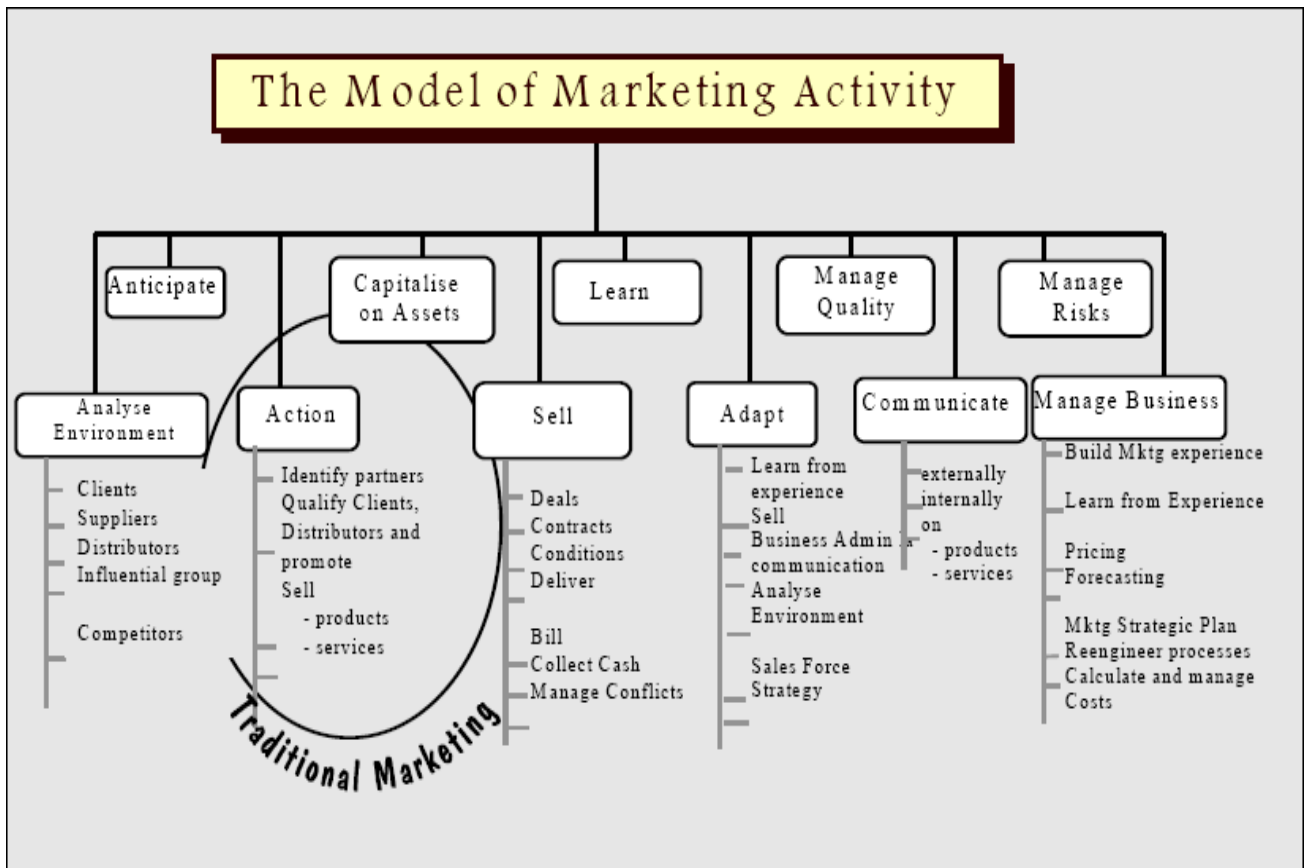
other hand, has forced an evolution on that discipline. It will still evolve significantly in the next few years. It is not possible as yet to describe precisely what Marketing will be in the future, but we can present the main trends of those changes, this is what marketers call it Visionary Marketing.

I.2. Marketing Activity

At first we have to talk for a while about The Marketing Function and the Marketing Activity which is not always performed by a dedicated Marketing department, that Marketing department may even not practise any marketing at all; its role is often restricted to that of motivating the Sales force and feeding them with general information about products, prices, sales promotion campaigns, and possibly competitors. Marketing role is then integrate and collaborate with other the rest of departments within the organization in ways that enhance the business performance, to achieve the common goals of those departments as well as of the whole organization and its stakeholders. Figure 11 illustrates the variables that influence marketing and its activity; it is based on a Model which goes away beyond the frontiers that is determined by the marketing mix (see Figure 11).

The Model of Marketing activity as it is structured below in figure 11, is structured on several basic functions and sub-functions of the Marketing Activity, such as learning, anticipation, quality management, risk management, environment analysis, selling, communication and business management, these functions are theoretically strongly related to each other and then they must be related in reality too, but several empirical studies have shown that fewer companies only include such a structure that allows the different departments to work together in an easy way which leads to a higher business performance through having a better interdepartmental integration.

Figure 11: The Model of Marketing Activity¹



Source: <http://y gourven2.free.fr/webcom/wanadoo/vmd.pdf>, by Yann A. GOURVENNEC, May 2006.

Within today’s markets the value added for most companies comes from the quality of the experience they provide to their customers. They are rapidly moving beyond simple customer satisfaction to creating unforgettable memories and experiences for those customers. The most successful companies today have learned how to help customers becoming what they want to be. They realize this by linking the service or solution to the customer's dreams or lifestyle, by telling stories and entertaining and by promoting the dreams along with the product; as that a customer is a principal source of the firms’ revenues, all that has been more important day after day within the fast-changing world of business, especially for the business applications for the modern company, which must control its relationships with its customers, and its suppliers, to ensure its growth, after making sure its survival on this days’ market, and to do that marketers, executives and every employee on any firm that want to help his or her company must to stay awake for nights to have power over some specific functional methods, complicated tools and

¹ <http://y gourven2.free.fr/webcom/wanadoo/vmd.pdf>, by Yann A. GOURVENNEC, May 2006.

essential systems for any firm even a small or a multinational firm, these systems are huge and attached to each others. Firms then are trying their best through improving their products and services to satisfy their customers in ways that lead to get their loyalty, because it's the only source of revenues for the firm.

I.3. Product Lifecycle:

Product Lifecycle or PLC as a short acronym is a well known marketing and economic concept, which refers to the sales numbers of new products according the product existence life-time, and it is based upon four main phases named as: 1) Introduction, 2) Growth, 3) Maturity, and 4) Decline; just like the biological life cycle for any plant or animal. For example, a seed is planted (introduction); it begins to sprout (growth); it shoots out leaves and puts down roots as it becomes an adult (maturity); after a long period as an adult the plant begins to shrink and die out (decline).

In theory it's the same for a product. After a period of development it is introduced or launched into the market; it gains more and more customers as it grows; eventually the market stabilises and the product becomes mature; then after a period of time the product is overtaken by development and the introduction of superior competitors, it goes into decline and is eventually withdrawn.

PLC can be de divided into 4 stages as shown in the figure (12) which follows;

I.3.a. Introduction:

The need for immediate profit is not a pressure. The product is promoted to create awareness. If the product has no or few competitors, a skimming price strategy is employed. Limited numbers of product are available in few channels of distribution. In the introduction stage, the firm seeks to build product awareness and develop a market for the product. The impact on the marketing mix is as follows:

- **Product** branding and quality level is established and intellectual property protection such as patents and trademarks are obtained.
- **Pricing** may be low penetration pricing to build market share rapidly, or high skim pricing to recover development costs.
- **Distribution** is selective until consumers show acceptance of the product.
- **Promotion** is aimed at innovators and early adopters. Marketing communications seeks to build product awareness and to educate potential consumers about the product.

I.3.b. Growth:

Competitors are attracted into the market with very similar offerings. Products become more profitable and companies form alliances, joint ventures and take each other over. Advertising spend is high and focuses upon building brand. Market share tends to stabilise. In the growth stage, the firm seeks to build brand preference and increase market share.

- **Product** quality is maintained and additional features and support services may be added.
- **Pricing** is maintained as the firm enjoys increasing demand with little competition.
- **Distribution** channels are added as demand increases and customers accept the product.
- **Promotion** is aimed at a broader audience.

I.3.c. Maturity:

Those products that survive the earlier stages tend to spend longest in this phase. Sales grow at a decreasing level and then stabilise. Producers attempt to differentiate products and brands are key to this. Price wars and intense competition occur. At this point the market reaches saturation. Producers begin to leave the market due to poor margins. Promotion becomes more widespread and uses a greater variety of media.

At maturity, the strong growth in sales diminishes. Competition may appear with similar products. The primary objective at this point is to defend market share while maximizing profit.

- **Product** features may be enhanced to differentiate the product from that of competitors.
- **Pricing** may be lower because of the new competition.
- **Distribution** becomes more intensive and incentives may be offered to encourage preference over competing products.
- **Promotion** emphasizes product differentiation.

I.3.d. Decline:

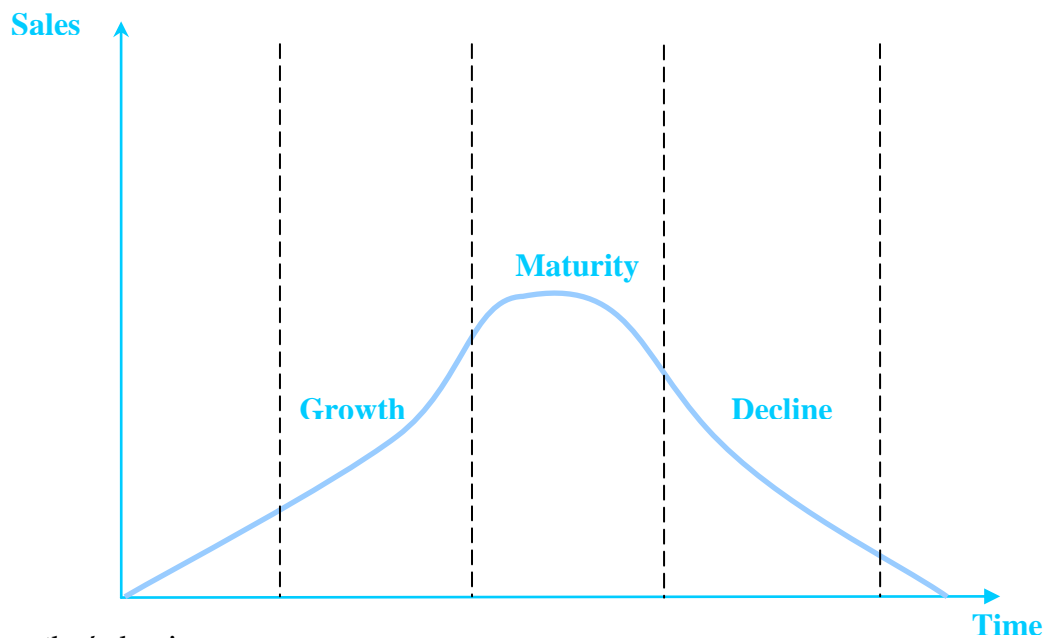
As sales decline, the firm has several options:

- Maintain the product, possibly rejuvenating it by adding new features and finding new uses.

- Harvest the product - reduce costs and continue to offer it, possibly to a loyal niche segment.
- Discontinue the product, liquidating remaining inventory or selling it to another firm that is willing to continue the product.

The marketing mix decisions in the decline phase will depend on the selected strategy. For example, the product may be changed if it is being rejuvenated, or left unchanged if it is being harvested or liquidated. The price may be maintained if the product is harvested, or reduced drastically if liquidated.

Figure 12: Product LifeCycle



The author's drawing.

As seen in the Figure 12; products are just like human beings, they also have their own life-cycle. From birth to death human beings pass through various stages e.g. birth, growth, maturity, decline and death. A similar life-cycle is seen in the case of products. The product life cycle goes through multiple phases, involves many professional disciplines, and requires many skills, tools and processes. A new product progresses through a sequence of stages from introduction to growth, maturity, and decline. This sequence is known as the product life cycle and is associated with changes in the marketing situation, thus impacting the marketing strategy and the marketing mix. Product life cycle (PLC) has to do with the life of a product in

the market with respect to business/commercial costs and sales measures. To say that a product has a life cycle is to assert four things:

- that products have a limited life,
- product sales pass through distinct stages, each posing different challenges, opportunities, and problems to the seller,
- profits rise and fall at different stages of product life cycle, and
- Products require different marketing, financial, manufacturing, purchasing, and human resource strategies in each life cycle stage.

It is claimed that every product has a life period, it is launched, it grows, and at some point, may die. A fair comment is that - at least in the short term - not all products or services die. Jeans may die, but clothes probably will not. Legal services or medical services may die, but depending on the social and political climate, probably will not.

I.4. Definition of Customer:

Customer-oriented product development has become vital for firms facing global competition, companies then need to think of the “customer” in the broadest sense, our definition needs to include suppliers, partners, investors, employees, and others we deal with in our definition. Each of these groups has specific and unique requirement when dealing with any organization. Customers need to be able to find out about these firms’ products and services and be able to make purchase, thus the firms also need to track each customer’s activity in order to make offers of complimentary products and new products that they may provide, keeping in mind that eighty percent (80%) of their business will come from twenty percent (20%) of their customers- the 80/20 principle- so what is a customer?

A customer could be the most important person in any business, he may be someone who makes use of or receives the products or services of an individual or organization. The word historically derives from "custom", meaning "habit"; a customer was someone who frequented a particular shop, who made it a habit to purchase goods there, and with whom the shopkeeper had to maintain a relationship to keep his or her "custom," meaning expected purchases in the future. Customer needs may be defined as the goods or services a customer requires to achieve specific goals. Different needs are of varying importance to the customer. Customer expectations are influenced by cultural values, advertising, marketing, Customer Relationship Management (CRM) and other communications, both with the supplier and with other sources; the identification and translation of customer needs early in the design

process is a major challenge for product design researchers. Some needs are explicit and customers can state them very clearly. Other needs are implicit, so customers cannot express them, e.g., those pertaining to the affective and emotional sphere.¹

Both customer needs and expectations may be determined through interviews, surveys, conversations, data mining or other methods of collecting information. Customers at times do not have a clear understanding of their needs. Assisting in determining needs can be a valuable service to the customer. In the process, expectations may be set or adjusted to correspond to known product capabilities or service.

A customer also is a part of any business not an outsider. A customer is not just money in the cash register. He is a human being with feelings and deserves to be treated with respect, his needs must be treated with such an interesting care in ways that brings benefits to the company and its stakeholders, according to Pasquale Erto; (2009) these needs have three main characteristics that create difficulties in product development tasks. Firstly, not all of the customers' needs are explicitly or clearly stated by them. Secondly, not all of the customers' needs are easily transformed into engineering characteristics. Thirdly, these needs quickly change due to environmental factors such as advertising.²

Because of the markets in the world move rapidly, a product's life cycle is coming shorter and shorter, and customers' expectations increase and competition becomes more aggressive. Companies can't afford to waste time watching; so many companies (successful companies) around the whole world, but especially in Canada, Western Europe, the United Kingdom, and the USA and other ones, decided not to wait and have chosen CRM (Customer Relationship Management) solutions to:

- Serve their customers better.
- Deal more effectively with sales relationships.
- Reduce costs and the time to market.
- React faster and more proactively to the market.
- Build customer loyalty.

The validity of a CRM or Customer Service solution is proved by its success among the customers that use it, by the benefits and the competitive advantage they gain in the market.

Moreover; a customer does firms a favour when he comes in. Firms aren't doing him a favour by waiting on him, so he or she could be the only boss in any business, because he/she may perhaps fire every person in any company by just going another way, and buy from another

¹ Erto Pasquale; (2009) "Statistics for Innovation- Statistical Design of "Continuous" Product Innovation", ISBN 978-88-470-0814-4. Springer. p

3

² Idem.p 4.

firm. So without incomes the firms won't survive by that everybody in that firm could be unemployed.

Thus a customer is the most important source of incomes of the firms, especially on today's market, because *"the driving force of behind world economic growth has changed from manufacturing volume to improving customer value. As a result, the key success factor for many firms is maximising customer value"*¹

The chief business value of becoming a customer-focused business lies in its ability to help them keep customers loyal, anticipate their future needs, respond to customer concerns, and provide top-quality customer service; this strategic focus on customer value recognizes that quality, rather than price, has become the primary determination in a customer's perception of value. Firms keep track of their customers' individual preferences; keep up with market trends, supply products, services, and information. Firms have created a strategic opportunity to offer fast, responsive, high quality products and services customized to individual customer preferences. Firms also have made customers the focal point of customer relationship management (CRM) and other business applications, CRM systems, supply chain management, enterprise resources planning, internet, intranet, and extranet websites create new channels for interactive communications within a firm, with customers, and with the suppliers, business partners, and so on. All this enables continual interaction with customers by most enterprise functions and encourage cross-functional collaboration in product development, marketing, delivery, service, and technical support.

Typically, customers use the internet to ask questions, lodge complaints, evaluate products, request support, and make and track their purchases, this encourages the creation of cross-functional discussion groups and problem-solving teams dedicated to customer involvement, service and support, but firms have to understand also the criterions of behavioral side on its customers choices, therefore contained by the fast-changing competitive business world, the firms wish attract more customers, grow up their business, get those customers loyal, and increase their benefits.

II. Relationship between innovation and customer satisfaction

In this section we aim to clarify the relationship found between innovation and customer satisfaction; so that, we divided it into Six sub-titles; which are as following: 1) Studying Consumer buyer behavior types and factors; 2) Importance of Customer Information;

¹ Cronin, Mary. "The internet strategy handbook". Boston: Harvard business school press, 1996.

3) Customer Experience Cycle; 4) Customer Satisfaction; 5) The relationship between customer satisfaction and customer loyalty; 6) Market Orientation and Innovation

II.1. Studying Consumer buyer behavior types and factors

Possibly; the most challenging concept in marketing deals with understanding why buyers do what they do, or why they don't do what should to do. But such knowledge is critical for executives since having a strong understanding of buyer behavior will help shed light on what is important to the customer and also suggest the important influences on customer decision-making. Using this information, executives can create marketing programs that they believe will be of interest to customers, and as we might guess, factors affecting how customers make decisions are extremely complex. Buyer behavior is deeply rooted in psychology with dashes of sociology thrown in just to make things more interesting. Since every person in the world is different, it is impossible to have simple rules that explain how buying decisions are made. But those who have spent many years analyzing customer activity have presented us with useful "guidelines" in how someone decides whether or not to make a purchase.

In fact, if we pick up any book that examines customer behavior and each seems to concept it from a different angle. The perspective we take is to touch on just the basic concepts that appear to be commonly accepted as influencing customer behavior, so in this section we will try examine the buying behavior of consumers. But at first we have to discuss the types of consumer purchase decisions, which follow.

II.1.a. Types of Consumer Purchase Decisions

Consumers are faced with purchase decisions nearly every day. But not all decisions are treated the same. Some decisions are more complex than others and thus require more effort by the consumer. Other decisions are fairly habitual and require little effort. In general, consumers face four types of purchase decisions:

1. **Minor New Purchases:** these purchases represent something new to a consumer but in the customer's mind is not a very important purchase in terms of need, money or other reason.
2. **Minor Re-Purchases:** these are the most routine of all purchases and often the consumer returns to purchase the same product without giving much thought to other product options.
3. **Major New Purchases:** these purchases are the most difficult of all purchases because these are important to the consumer but the consumer has little or no previous

experience making the purchase and is important. This type of decision often requires the consumer to engage in an extensive decision-making process.

4. **Major Re-Purchase:** these purchase decisions are also important to the customer but the customer feels more confident in making the decision since they have experienced purchasing the product in the past.

II.1.b. Major factors that influence purchasing

For marketers it is important to understand how consumers treat the purchase decisions they face. If a company is targeting customers who feel a purchase decision is difficult, their marketing strategy may vary greatly from a company targeting customers who view the purchase decision as routine. In fact, the same company may face both situations at the same time; for some the product is new, while other customers see the purchase as routine. The implication of buying behavior for marketers is that different buying situations require different marketing efforts.

Whatever; Why Consumers Buy? It is a complex and repeated question that marketers and executives both ask every time, and some of them have given us a help to understand the consumers buyer behavior, and they have presented us with helpful procedures of that concept, whatsoever customers make purchases in order to satisfy needs. Some of these needs are basic and must be filled by everyone on the planet such as food, shelter, while others are not required for basic survival and vary depending on the person. It probably makes more sense to classify needs that are not a necessity as wants or desires. In fact, in many countries where the standard of living is very high, a large portion of the population's income is spent on wants and desires rather than on basic needs.

In this chapter when we mention the consumer we are referring to the actual buyer, the person spending the money. But it should also be pointed out that the one who does the buying is not necessarily the user of what is bought and that others may be involved in the buying decision in addition to the actual buyer. While the purchasing process in the consumer market is not as complex as the business market, having multiple people involved in a purchase decision is not unusual. So understanding consumer purchase behavior involves not only understanding how decisions are made but also understanding the dynamics that influence purchases.

By the way marketers are well served to understand the key influences. By doing so they may be in a position to tailor their marketing efforts to take advantages of these influences in a way that will satisfy the consumer and the marketer, and for the purposes of this chapter we will break these influences down into two main categories: Internal, and External. However; for the

most part the influences are not mutually exclusive. Instead, they are all interconnected and, as we will see, work together to form who we are and how we behave. For each of the influences that are discussed we will provide a basic description and also suggest its implication to marketers, but we will only provide a few marketing implications for each influence; clearly there are many more.

II.1.b.1. Internal influences

We start our examination of the influences on consumer purchase decisions by first looking inside ourselves to see that are the most important internal factors that affect how we make choices.

➤ **Perceptual Filter:** Perception is how we see ourselves and the world we live in. However, what ends up being stored inside us doesn't always get there in a direct manner. Often our mental makeup results from information that has been consciously or unconsciously filtered as we experience it, a process we refer to as a perceptual filter. To us this is our reality, though it does not mean it is an accurate reflection on what is real. Thus, perception is the way we filter stimuli, for example someone talking to us, reading a newspaper story and then make sense out of it.

Perception has several steps such as the following ones;

- **Exposure:** sensing stimuli.
- **Attention:** an effort to recognize the nature of stimuli.
- **Awareness:** assigning meaning to a stimuli.
- **Retention:** adding the meaning to one's internal makeup.

How these steps are eventually carried out depends on a person's concept to learning. By learning we mean how someone changes what they know, which in turn may affect how they act. There are many theories of learning, however, suffice to say that people are likely to learn in different ways. For instance, one person may be able to focus very strongly on a certain advertisement and be able to retain the information after being exposed only one time while another person may need to be exposed to the same advertisement many times before he/she even recognizes what it is. Consumers are also more likely to retain information if a person has a strong interest in the stimuli. If a person is in need of new car they are more likely to pay attention to a new advertisement for a car while someone who does not need a car may need to see the advertisement many times before they recognize the brand of automobile.

Moreover; companies spend large sums of money in an attempt to get customers to have a positive impression of their products. But clearly the existence of a perceptual filter

suggests that getting to this stage is not easy. Exposing consumers to a product can be very challenging considering the amount of competing product messages that are also trying to accomplish the same objective. So marketers must be creative and use various means to deliver their message once the message reaches consumer it must be interesting enough to capture their attention for example talking about the product's benefits. But attending to the message is not enough. For marketers the most critical step is the one that occurs with awareness. Here executives must continually monitor and respond if their message becomes distorted in ways that will negatively shape its meaning. This can often happen due in part to competitive activity such as comparison advertisements. Finally, getting the consumer to give positive meaning to the message they have retained requires the marketer make sure that consumers accurately interpret the facts about the product.

- **Knowledge:** Knowledge is the sum of all information known by a person. It is the facts of the world as he/she knows it and the depth of knowledge is a function of the breadth of worldly experiences and the strength of an individual's long-term memory. Obviously what exists as knowledge to an individual depends on how an individual's perceptual filter makes sense of the information it is exposed to. By the way firms may conduct research that will gauge consumers' level of knowledge regarding their product. As we will see below, it is likely that other factors influencing consumer behavior are in large part shaped by what is known about a product. Thus, developing methods to encourage consumers to accept more information, or correct information, may affect other influencing factors.
- **Attitude:** In simple terms attitude refers to what a person feels or believes about something. Additionally, attitude may be reflected in how an individual acts based on his or her beliefs. Once formed, attitudes can be very difficult to change. Thus, if a consumer has a negative attitude toward a particular issue it will take considerable effort to change what they believe to be true. Today; on the huge competitive market almost of companies facing consumers whom have a negative attitude toward their product must work to identify the key issues shaping a consumer's attitude then adjust marketing decisions such as advertising in an effort to change the attitude. For companies competing against strong rivals to whom loyal consumers exhibit a positive attitude, an important strategy is to work to see why consumers feel positive toward the competitor and then try to meet or beat the competitor on these issues. Alternatively, a company can try to locate customers who feel negatively toward the competitor and then increase awareness among this group.
- **Personality:** An individual's personality relates to perceived personal characteristics that are consistently exhibited, especially when one acts in the presence of others. In most, but not

all, cases the behaviors on projects in a situation is similar to the behaviors a person exhibits in another situation. In this way personality is the sum of sensory experiences others get from experiencing a person for example how one talks, reacts. While one's personality is often interpreted by those we interact with, the person has their own vision of their personality, called self concept, which may or may not be the same as how others view us. For firms it is important to know that consumers make purchase decisions to support their self concept. Using research techniques to identify how customers view themselves may give marketers insight into products and promotion options that are not readily apparent. For example, when examining consumers a marketer may initially build marketing strategy around more obvious clues to consumption behavior, such as consumer's demographic indicators such as age, occupation, income. However, in-depth research may yield information that shows consumers are purchasing products to fulfill self-concept objectives that have little to do with the demographic category they fall into for example senior citizen may be making purchases that make them feel younger. Appealing to the consumer's self concept needs could expand the market to which the product is targeted.

- **Lifestyle:** This influencing factor relates to the way we live through the activities we engage in and interests we express. In simple terms it is what we value out of life. Lifestyle is often determined by how we spend our time and money. However; Products and services are purchased to support consumers' lifestyles. Marketers have worked hard researching how consumers in their target markets live their lives since this information is key to developing products, suggesting promotional strategies and even determining how best to distribute products.
- **Roles:** Roles represent the position we feel we hold or others feel we should hold when dealing in a group environment. These positions carry certain responsibilities yet it is important to understand that some of these responsibilities may, in fact, be perceived and not spelled out or even accepted by others. In support of their roles, consumers will make product choices that may vary depending on which role they are assuming. As illustration, a person who is responsible for selecting snack food for an office party his boss will attend may choose higher quality products than he would choose when selecting snacks for his family. By the way Advertisers often show how the benefits of their products aid consumers as they perform certain roles. Typically the underlying message of this promotional concept is to suggest that using the advertiser's product will help raise one's status in the eyes of others while using a competitor's product may have a negative effect on status.

➤ **Motivation:** Motivation relates to our desire to achieve a certain outcome. Many internal factors we have already discussed can affect a customer's desire to achieve a certain outcome but there are others. For instance, when it comes to making purchase decisions customers' motivation could be affected by such issues as financial position, time constraints, overall value, and perceived risk, motivation is also closely tied to the concept of involvement, which relates to how much effort the consumer will exert in making a decision. Highly motivated consumers will want to get mentally and physically involved in the purchase process. Not all products have a high percentage of highly involved customers, but marketers who market products and services that may lead to high level of consumer involvement should prepare options that will be attractive to this group. For instance, marketers should make it easy for consumers to learn about their product and for some products, allow customers to experience the product before committing to the purchase.

II.1.b.2. External influences

Consumer purchasing decisions are often affected by factors that are outside of their control but have direct or indirect impact on how we live and what we consume, these factors which we will talk about, are very important but also very huge and very complicated, and they are like the following;

➤ **Culture:** Culture represents the behavior, beliefs and, in many cases, the way we act learned by interacting or observing other members of society. In this way much of what we do is shared behavior, passed along from one member of society to another. Yet culture is a broad concept that, while of interest to marketers, is not nearly as important as understanding what occurs within smaller groups or sub-cultures to which we may also belong. Sub-cultures also have shared values but this occurs within a smaller groups. For instance, sub-cultures exist where groups share similar values in terms of ethnicity, religious beliefs, geographic location, special interests and many others, whatever; as part of their efforts to convince customers to purchase their products, marketers often use cultural representations, especially in promotional appeals. The objective is to connect to consumers using cultural references that are easily understood and often embraced by the consumer. By doing so the marketer hopes the consumer feels more comfortable with or can relate better to the product since it corresponds with their cultural values. Additionally, smart marketers use strong research efforts in an attempt to identify differences in how sub-culture behaves. These efforts help pave the way for spotting trends within a sub-culture, which the marketer can capitalize on through new marketing tactics for example new products, new sales channels, added value and so on.

- **Other Group Membership:** In addition to cultural influences, consumers belong to many other groups with which they share certain characteristics and which may influence purchase decisions. Often these groups contain opinion leaders or others who have major influence on what the customer purchases. Some of the basic groups we may belong to include:
 - **Social Class:** represents the social standing one has within a society based on such factors as income level, education, occupation
 - **Family:** one's family situation can have a strong effect on how purchase decisions are made
 - **Reference groups:** most consumers simultaneously belong to many other groups with which they associate or, in some cases, feel the need to disassociate.
 - Whatever; identifying and understanding the groups consumers belong to is a key strategy for executives. Doing so helps identify target markets, develop new products, and create appealing marketing promotions to which consumers can relate. In particular, marketers seek to locate group leaders and others to whom members of the group look for advice or direction. These opinion leaders, if well respected by the group, can be used to gain insight into group behavior and if these opinion leaders accept promotional opportunities could act as effective spokespeople for the marketer's products.
 - **Situation:** A purchase decision can be strongly affected by the situation in which people find themselves. Not all situations are controllable, in which case a consumer may not follow their normal process for making a purchase decision. For instance, if a person needs a product quickly and a store does not carry the brand they normally purchase, the customer may choose a competitor's product; firms can take advantage of decisions made in uncontrollable situations in at least two ways. First, the marketers can use promotional methods to reinforce a specific selection of products when the consumer is confronted with a particular situation. For example, automotive services can be purchased that promise to service vehicles if the user runs into problems anywhere and at anytime. Second, marketers can use marketing methods that attempt to convince consumers that a situation is less likely to occur if the marketer's product is used. This can also be seen with auto products, where marketers explain that using their product will prevent unexpected damage to their vehicles.

So; now that we have discussed the factors influencing a consumer's decision to purchase, let's examine the process itself. This process is presented in a sequence of 5 steps as shown below.

II.1.c. The process of consumer buying behavior

Whether a consumer will actually carry out each step depends on the type of purchase decision that is faced. For instance, for minor re-purchases the consumer may be quite loyal to the same brand, thus the decision is a routine one (i.e., buy the same product) and little effort is involved in making a purchase decision. In cases of routine, brand loyal purchases consumers may skip several steps in the purchasing process since they know exactly what they want allowing the consumer to move quickly through the steps. But for more complex decisions, such as Major New Purchases, the purchasing process can extend for days, weeks, months or longer. So in presenting these steps marketers should realize that, depending on the circumstances surrounding the purchase, the importance of each step may vary, we will try discuss the five (5) steps of consumer buying behavior process, on the subsequent part;

1. Need/Want/Desire is recognized: In the first step the consumer has determined that for some reason he/she is not satisfied and wants to improve his/her situation. For instance, internal triggers, such as hunger or thirst, may tell the consumer that food or drink is needed. External factors can also trigger consumer's needs. Marketers are particularly good at this through advertising; in-store displays and even the intentional use of scent. At this stage the decision-making process may stall if the consumer is not motivated to continue. However, if the consumer does have the internal drive to satisfy the need they will continue to the next step.

2. Search for Information: Assuming consumers are motivated to satisfy his or her need, they will next undertake a search for information on possible solutions. The sources used to acquire this information may be as simple as remembering information from past experience or the consumer may expend considerable effort to locate information from outside sources such as Internet search, or talking with others. How much effort the consumer directs toward searching depends on such factors as: the importance of satisfying the need, familiarity with available solutions, and the amount of time available to search. To appeal to consumers who are at the search stage, marketers should make efforts to ensure consumers can locate information related to their product. For example, for marketers whose customers rely on the Internet for information gathering, attaining high rankings in search engines has become a critical marketing objective.

3. Evaluate Options: Consumers' search efforts may result in a set of options from which a choice can be made. It should be noted that there may be two levels to this stage. At level one the consumer may create a set of possible solutions to their needs (i.e., product types) while at level two the consumer may be evaluating particular products within each solution. For example, a consumer who needs to replace a television has multiple solutions to choose

from such as plasma, LCD and so on. Within each solution type will be multiple brands from which to choose. Marketers need to understand how consumers evaluate product options and why some products are included while others are not. Most importantly, marketers must determine which criteria consumers are using in their selection of possible options and how each criterion is evaluated. Returning to the television example, marketing tactics will be most effective when the marketer can tailor their efforts by knowing what benefits are most important to consumers when selecting options for example picture quality, brand name, or screen size, and then determine the order of importance of each benefit.

4. Purchase: In many cases the solution chosen by the consumer is the same as the product whose evaluation is the highest. However, this may change when it is actually time to make the purchase. The “intended” purchase may be altered at the time of purchase for many reasons such as: the product is out-of-stock, a competitor offers an incentive at the point-of-purchase, the customer lacks the necessary funds for example credit card not working, or members of the consumer’s reference group take a negative view of the purchase that may be friend is critical of purchase. Marketers whose product is most desirable to the consumer must make sure that the transaction goes smoothly. For example, Internet retailers have worked hard to prevent consumers from abandoning online purchase for example online shopping carts, by streamlining the checkout process. For marketers whose product is not the consumer’s selected product, last chance marketing efforts may be worth exploring, such as offering incentives to store personnel to “talk up” their product at the checkout line.

5. After-Purchase Evaluation: Once the consumer has made the purchase they are faced with an evaluation of the decision. If the product performs below the consumer’s expectation then he/she will re-evaluate satisfaction with the decision, which at its extreme may result in the consumer returning the product while in less extreme situations the consumer will retain the purchased item but may take a negative view of the product. Such evaluations are more likely to occur in cases of expensive or highly important purchases. To help ease the concerns consumers have with their purchase evaluation, marketers need to be receptive and even encourage consumer contact. Customer service centres and follow-up market research are useful tools in helping to address purchasers’ concerns.

We have just given up some of the key concepts and definitions that might help us understand consumer buying behaviour that may help us get our customers’ loyalty, because the customers are the only important source of incomes of any firm.¹

¹ www.knowthis.com

II.2. Importance of Customer Information

In the past, consumer products companies learned about customers through traditional marketing research studies, such as surveys and focus groups. *Certainly information gained from traditional research techniques is valuable but this form of research relies more on sampling small groups of customers than on trying to gather information on a large portion of the customer base. With point-of-purchase (POP) technologies consumer products firms have the potential to learn much more about a larger group of customers than can be offered via traditional research methods. Eliciting customers' needs is one of the biggest challenges for firms and especially in case where customers are even not aware of the existence of these needs, firms have introduced and used several methods to capture customers' needs in the last decades, and the well known methods of these are;*

- *Voice of the Customer*
- *Quality Function Deployment*
- *Kano Model*
- *Kansei Engineering*
- *Integrating Kansei Engineering*
- *A New Practical Way to Measure Customer Preferences for Product Attributes*
- *A Simplified Version of the Kano Questionnaire¹*

In this part we are going to give a simple comparison between these methods through giving a brief definition or explanation for each one of them, in the table 9 which follows:

Table 9: a comparison between the main methods used for capturing customers' needs

Voice of the Customer	A structured list of customer needs for the product and/or service; this list is gathered by asking individual customers or focus groups to talk freely about their needs for the product or service in a survey.
Quality Function Deployment	A customer-oriented approach to product Innovation. This method provides a systematic process for translating customer requirements into technical requirements at each stage of product development and production
Kano Model	This method (Model) aims to understand the relationship between the fulfilment (or not) of a requirement (product feature) and the satisfaction or dissatisfaction experienced by the customer.
Kansei Engineering	consumer-oriented technology for new product development which made it possible to translate consumers' feelings about and images of a product into design elements and product feature
Integrating Kansei Engineering	An integration of the general structure of Quality Function Deployment with the results of a simplified Kansei engineering approach.
A New Practical Way to Measure Customer Preferences for Product Attributes	A method which is used to estimate the value that customers associate with a particular product feature/attribute
A Simplified Version of	A simplified and easy questionnaire of the questionnaire which was

¹ Stefano Barone, Alberto Lombardo and Pietro Tarantino; "statistics for innovation: Analysis of User Needs for the Redesign of a Postural Seat System"; Springerlink.

<p>the Kano Questionnaire</p>	<p>used in the traditional methodology for mapping customer needs into the Kano where the questionnaire consists of two questions for each customer requirement: a functional question captures the customer’s feelings when the requirement is fulfilled, and a dysfunctional question, but in this method the questionnaire requires one only question for each customer requirement.</p>
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Source: Stefano Barone, Alberto Lombardo and Pietro Tarantino. Idem.

Clearly since many parties have a keen interest in acquiring customer information it stands to reason that the possessor of this information will be a very important player in the value chain, this a cross-functional business system that we will talk briefly about on our last chapter. Unfortunately for some consumer products providers especially the smallest ones, the customer information they desperately seek is most likely in the hands of others. With the likes of Wal-Mart, Best Buy, Home Depot and other super-retailers owning customer point-of-purchase (POP) information, major consumer products firms are struggling to get a firm grasp on their final users. At best consumer products firms can purchase, for a large sum, some of this information from retailers or from market research firms who specialize in arranging information gathering deals with retailers. Bottom line, for consumer products firms acquiring customer information is a privilege and not a right.

But consumer products firms are not the only ones who see the need to capture more customer information. Any company relying on others to distribute its products or services faces a similar problem. For instance, entertainment companies face it with cable and satellite companies, and industrial products manufacturers face it with industrial distributors. The common thread is that the product or service supplier is not in control of final user information. And without this information suppliers are at a disadvantage in marketing to their customers. They may also face significant hurdles in negotiating with distributors since the holder of information may possess leverage when it comes to bargaining.

With today’s point-of-purchase (POP) technologies and powerful information storage, retrieval and analysis tools, gathering customer information has never been easier. By themselves POP technologies provide valuable marketing information from a product and location perspective. That is, sellers know how much of something is sold and where it is sold. But the real power for marketers exists when POP technologies are combined with methods of customer identification, such as customer loyalty cards or website login information. This combination provides the marketer with the potential for detailed understanding of customers in terms of demographics, purchase behaviour and product preferences. Armed with this information marketers have the opportunity to customize marketing activities to individual customers. This so called mass-customization strategy is already widely used by retailers. It is a common feature in grocery

stores where customers receive individually tailored promotional coupons and on certain e-commerce websites where characteristics of the site, such as product recommendations, are unique to an identified visitor.

But retailers are not the only ones who recognize the value of customer information. Product manufacturers also see this information as crucial to the success of their products. They realize the key to successful products rests with having a deep understanding of wants, needs, habits and anything else they can learn about their customers. They want to know as much about the final user of their products as the retailer since this information is a key component in developing new products, designing promotional campaigns, setting price levels and many other marketing decisions.

To access point-of-purchase information consumer products companies can continue to pay large sums to acquire customer data. Alternatively they can seek other points of leverage that may force information gatherers to loosen their grip on the data and share it in a more reasonable fashion.

While it would be extreme for some firms to pull out of the rival markets, the move to add more brands to an already formidable list of products could result in these firms demanding better access to customer information. If this strategy is successful more firms are bound to move in this direction, but it will be just the start of major merger activity by uneasy suppliers across many industries who seek control of customer information, especially in Algeria because Algerian Firms have not a control of their information, experts always say that because of that these Algerian companies are non-rival and latest firms on the whole world, because they really leaving money on the table, when they discuss or when they work.¹

II.3. Customer Experience Cycle

David Wagner says that “Clients want either the best or the least expensive; there is no in-between”. At this point we realized that the service is about much more than any simple one. It is about an experience, especially at prices. Even in those days, for example if we are one of the more expensive sellers, and we provide great services/products’ quality, but so did many other sellers. So we pondered, “What would make customers feel that our services/products are such a great value? How could we make everyone feel like a regular client?”

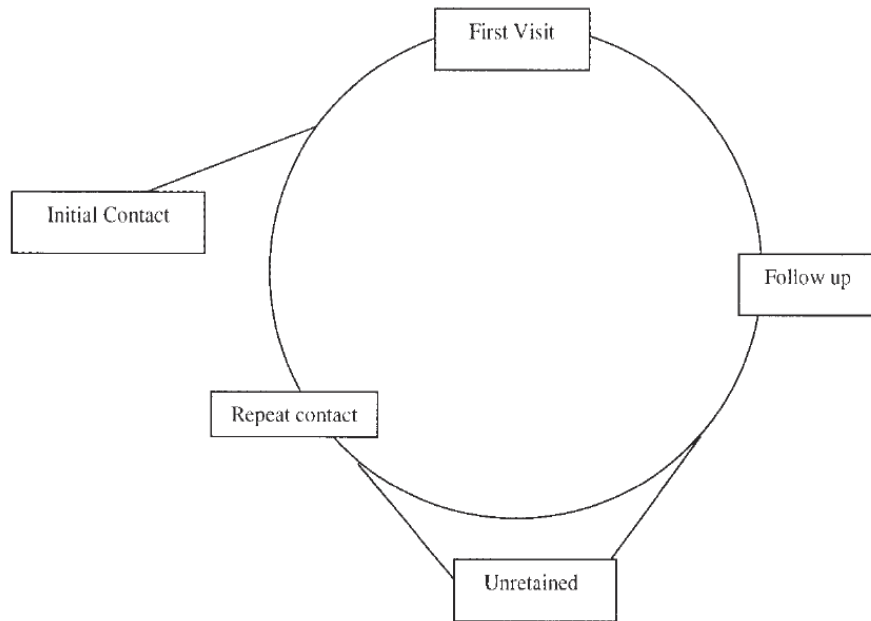
A lot of small and huge companies’ answers were to create and implement Secret Service systems that would become the foundation of their training program for all employees and would be just as important as their technical training.

¹ Stefano Barone, Alberto Lombardo and Pietro Tarantino; Op Cited

Plain and simple, they were creating a client-retention game plan that would help them get more clients to return to our salons on a regular basis. A major portion of our Secret Service systems is what marketers call the “Customer Experience Cycle”. This is the total experience, starting when the client first contacts any firm, continuing through the visit, and ending with that firm’s follow-up phone call a few days later.

These firms’ entire teams got together and started to brainstorm answers to some very specific questions: In a perfect world, what would they want clients to experience when those clients call them? What would these firms want clients to experience when they walk in the door? And so on. That brainstorming led to these firms’ Secret Service systems. It is of key importance that everyone participates in its development. Not only do marketers get excellent ideas that they may not have thought of on their own, but they also gain employee buy-in. If they had walked in one day and told the staff, “This is the way everyone is going to start answering the phone and greeting their clients from now on,” they would not have been open to it. Because their own ideas were implemented, those staff owned them and wanted to prove they were excellent concepts. The foundation for the Customer Experience Cycle came out of this initial brainstorming event and we have used it ever since. Marketers borrowed many ideas from their experiences with businesses in some industries, especially restaurants, hotels, and distributors. They identified the stages of every possible situation a client could encounter, and they brainstormed what they ideally want to happen at each stage of the cycle. By looking closely at each stage, a company begins to develop perfect scenarios that it wants each customer to encounter and each staff member to execute. In the process of developing the Customer Experience Cycle, it’s important to include seemingly wild ideas. Some of them will prove impractical, but many can be modified and implemented. The key is to have a realistic game plan that every team member can be expected to follow on a consistent basis, by the way the Customer Experience Cycle varies from business to business; in many businesses firms, the customer makes the first contact; in others, the company makes the first contact. The length of the cycle can be as brief as a few minutes or can extend over several months. Regardless of these differences, every business can identify the clear impression it wants to make at each stage of the customer’s encounter. What do businesses want to happen the first time a client does business with them? Every business can develop its own Customer Experience Cycle. Develop an outline of their customer service cycle that will be expanded later. Here is (at figure 13) an outline to get those businesses started.

Figure 13: Stages of the Customer Experience Cycle



Source needed.

Initial contact (preliminary, probably by phone, or e-mail)

- Act in a professional and courteous manner.
- Reduce any anxiety and uncertainty caller may feel.
- Educate and inform the caller.
- Book the appointment (or close the sale).
- Provide an opportunity to schedule additional services.

Delivery of first product or service

- Act in a professional and courteous manner.
- Reduce any anxiety and uncertainty the client may feel.
- Create a truly friendly atmosphere.
- Provide a great experience.
- Exceed the client's expectations.
- Provide an opportunity to schedule another service.
- Give an impressive send off.

Follow-up

- Phone call
- Postcard
- Birthday card
- Newsletter
- E-mail and so on

If a client does not return to the firm, marketers used Send “We Miss You” card or e-mail reminding that it’s time for next appointment, and after a couple months they send an incentive to return, such as a 25 percent discount, if he or she doesn’t return back, the call centers of those firms must Call to survey why the client never returned, but if a customer does return (retained client) marketers must recognize that client as a repeat customer, and they have to repeat all steps of the initial contact stage. It is easy and extremely beneficial to develop Customer Experience Cycle (CEC). Firms must include their staff in breaking down each interaction of their customers’ contact with their call-centres. Not only will the executives provide valuable insight and ideas, they will also take ownership of the new Customer Experience Cycle. Very few models will look the same; a retail store’s model will be drastically different than a manufacturer’s or auto mechanics. Regardless, each will have the basic foundation, such as initial contact, activity of purchase/service, completion of the experience, follow-up, and hopefully repeat business.

Putting the Customer Experience Cycle on paper is the point at which many businesses stop. After creating a general model, they simply hope their staff will use good judgment and common sense. Common sense is, unfortunately, sometimes uncommon, and employees often find it easier to take the path of least resistance. Exceptional customer service is never easy. Experience Cycle is the minimum any company wants each client to experience at each stage, not the maximum. If an employee wants to add to it or improve on it, that should be encouraged. The Customer Experience Cycle is meant to be a game plan to be followed consistently.

For every service firms must have a Customer Experience Cycle. Many details are unique to each cycle, although it may seem like a great deal of additional work to develop and incorporate the Customer Experience Cycle (CEC) and to create the required systems, the cycle eventually becomes second nature. Virtually everything in the Customer Experience Cycle is value added and provided at no extra charge, regardless of whether the client gets a 1 DZD or a 1000 DZD product/service, the price is determined by the level, and the quality of the product, but is depended on the satisfaction that will this customer gets. Based on the firm’ analysis of the customer service cycle, executives have to create products or services’ facilities that are truly unique, not just in their region but also rivalling businesses anywhere in Algeria. When customers walk into the chop stores of any firm that knows well its Customer Experience Cycle, they are greeted and checked in by a hostess who starts them experience. Instead of a traditional waiting area which has a negative association, these firms feature an experience area

where those customers can shop, test products, or purchase gift certificates; attached to the experience area is a café, where clients and team members can purchase cappuccinos, candies, salads, sandwiches and so on.

II.4. Customer Satisfaction

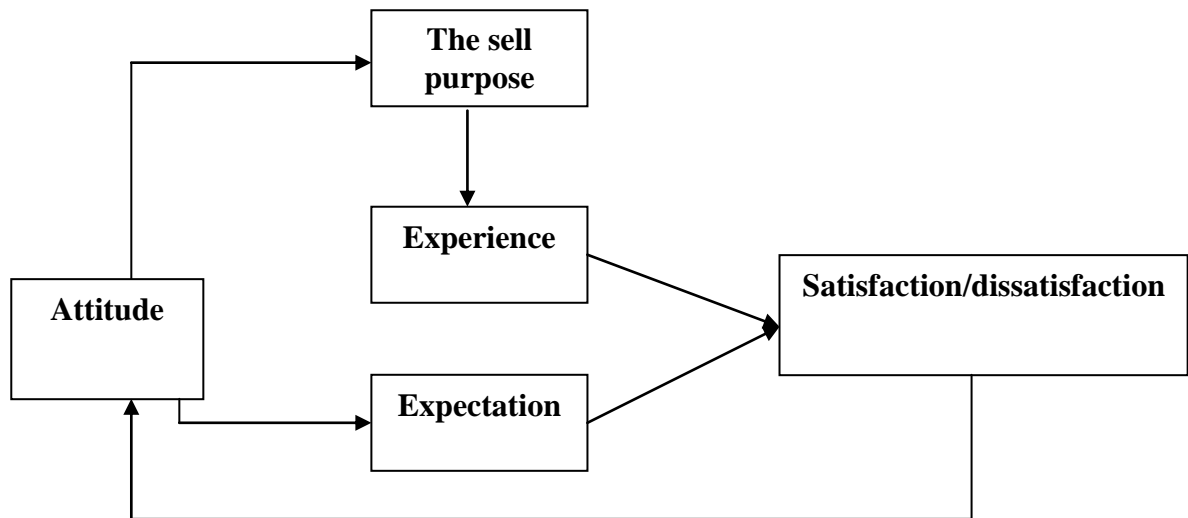
Customer satisfaction was simply defined as a measurement of how well the organization is performing from the customer's perspective. Having defined an agreed upon level of service for each customer that gives them a clear understanding on which to base their satisfaction with the organization. Oliver (1997) takes the review that satisfaction is “¹the emotional reaction following a disconfirmation experience”. **Getty and Thompson** (1994) defined satisfaction as a “*summary psychological state experienced by the consumer when confirmed or disconfirmed expectations exist with respect to a specific service transaction or experience*”²

Over the last few decades, products’ quality has become the leading issue in many leading firms in order to improve competitiveness and increase customer satisfaction (Dahlgard et al. 2002), nevertheless; customers could build their satisfaction on a service or product not even provided, whatever; the customer places a call to the help desk and requests this product or/and service. Instead of the help desk just rejecting the customer on this request, they can now refer to the service model and inform the customer that this is a service not provided per the agreed service model, which provides a framework for the development of metrics, against which the organization is rated. This documents a clear understanding for both the customer and supplier of expectation levels in key areas. *The metrics not only spell out expectations of the supplier, but those of the customer as well. For example, "Skills Achievement" of the employees using the applications can be a metrics to judge the knowledge level of the employees (customers) using the applications. This could be rated against a certification test that each employee must take. Ensuring that the employees are trained and understand the applications they are working in will increase the customer satisfaction level.*

We will see the confrontation between the experience and the leading elements to the satisfaction or to the dissatisfaction of customers, on the following figure. (Figure 14):

¹ Dahlgard, J.J., Kristensen, K., Kanji, G.K.: Fundamentals of Total Quality Management. Nelson Thornes Ltd., Cheltenham (1998), Cited in Erto Pasquale; (2009) Ibid.

² : Adrian PALMER; principles of services marketing; 4th edition, London; 2005.p 263.

Figure 14: The model of satisfaction

Source: Oliver, "A cognitive model of the antecedent and consequences of satisfaction decision", *journal of marketing research*, November 1980.

When the product/service model is taken to the next step, a tier support level document is developed that shows not only what services or/and products are provided by the organization, but also outlines all the products/services required by the customers. Whatever; the customer satisfaction is a start point to the customer loyalty, so how to Switch from Client Satisfaction to Client Loyalty?

II.4.a. Managing Customer Satisfaction

The achievement of customer satisfaction is a real contribution to ongoing opportunities associated with the customer business relationship. However, customer satisfaction issues and information also tend to surface in the marketplace to reflect on and communicate the project management capability of the relevant organization. Therefore, any firm has to ensure that the customer's experience with project performance conducted by the relevant organization is one that meets the customer's business needs and expectations. It can do this by establishing the means to monitor and respond to customer satisfaction issues on a nearly continuous basis. Firms should develop the processes and procedures needed by the project managers and project teams members to gauge customer satisfaction throughout the project management life cycle and to respond to any indications of customer dissatisfaction. In turn, the firm can play a key role in helping to discern customer satisfaction levels and in defining and implementing

responses that can be used across projects within the relevant organization. Whatever the firm should pursue three primary activities, as prescribed in the following subsections.

II.4.b. Measuring Customer Satisfaction

The only way to know the level of customer satisfaction achieved is to measure it. The firm can be instrumental in developing measurements for use by the project manager and project team, but it can also actively participate in conducting customer satisfaction measurements and analyzing results across all projects.

Most customer satisfaction measurement actions can be performed by the project manager and can be included as an integral part of the project management methodology. However, the marketers or senior managers within the relevant organization also can perform measurement actions, sometimes independent of project performance.¹ The following examples are about some kinds of customer satisfaction measurements that can be conducted in association:

- Business manager follow-up
- PMO and executive follow-up
- Informal customer contact
- Formal customer satisfaction surveys
- Customer feedback report and so many others.

II.4.c. Conducting Customer Relationship Programs

Customer satisfaction is distinctly associated with projects that produce the desired deliverables and achieve the prescribed customer business objectives. Customer satisfaction with project performance can be determined in direct alignment with project success. However, there are other means that the firm can use to complement project success as a primary reason for customer satisfaction and to induce customer satisfaction beyond the completion of the project effort. Firms must lead the efforts to determine what types of customer relationship programs can be developed and implemented to contribute to customer satisfaction, such as;

- Customer interest surveys
- Customer technical and business forums
- Customer post-project correspondence

¹ Center of the study of social policy; (2007) "Customer Satisfaction; Improving Quality And Access To Services And Supports In Vulnerable Neighborhoods : What The Research Tells Us";

- Customer post-project contact
- Customer newsletters

These follow-on customer programs help to build the customer relationship over time and, hopefully, contribute to extending each business customer relationship beyond a single project effort.

II.4.d. Implementing Customer-Centric Improvements

Managing customer satisfaction includes addressing improvement actions that the firms can take to increase the likelihood of customer satisfaction. Some improvement actions will be a result of natural business sense, while others will be more subtle. Firms should be privy to virtually all feedback and survey results from customer satisfaction measurements. It must compile and analyze such information, from a business perspective, to identify indicators within the project management environment that can be adjusted to improve upon general and specific customer satisfaction results. The firm's analyses should identify improvements that can be implemented in the integration of project management, technical, and business practices to increase individual and overall customer satisfaction. This means examining the project management environment from a customer's perspective and then determining what firms influence can be applied to engender a mutually rewarding customer business relationship. The specific examination of the project performance from the customer's perspective makes this a customer-centric activity. It extends and expands the traditional customer business relationship into the project management environment, and it seeks customer input and feedback to better position project management capability for achievement of results and benefits from the customer's point of view. However; the firm can develop and implement improvements to achieve greater customer satisfaction associated with project performance. The following are a few improvement areas to consider:

- Customer perceptions of project manager performance
- Customer perceptions of project management practices
- Customer perceptions of technical performance
- Customer perceptions of business performance, and so on.

Firm can examine these points and incorporate additional improvement indicators to its evaluation of customer satisfaction. It can then develop and implement improvements to its processes and practices according to the particular organization function area guidance it has established.

II.5. The relationship between customer satisfaction and customer loyalty:

Is it sufficient to satisfy clients in order to gain their loyalty? The commonsense answer to this question has generally been yes. But, are the clients strongly declaring their satisfaction? Moreover, the good customers may also be the same who complain so often and so loudly. The relationship “satisfaction implies loyalty” seems to suffer from many exceptions or inconsistencies. To explain how to switch from client satisfaction to client loyalty, we will use the most recent findings of consumer behavior science.

Today the answer is clear. In all areas, it appears that 60% to 80% of clients that switched their supplier would have declared just before leaving that they were very satisfied! Reichheld (1996)¹ even mentions the “satisfaction trap” which big companies fall into. So what is happening? Actually, satisfaction is necessary but not sufficient for loyalty, and the explanation of this phenomenon lies in understanding the nature of loyalty and the conditions that make up the relationship between satisfaction and loyalty.

When somebody asks different firms to define a loyal client, one will get various answers such as “the one always coming back”, “the one preferring us”, “the one talking positively about us”, “the one coming often”, “the one spending a lot”, “the one waiting for us when we are absent”, “the one having come for ages”, “the one liking us.” Obviously, because notions of frequencies, preferences, and attachments are already included, there is some truth in all of these statements. But, it also is revealing that there is not a consensus.

By nature, loyalty has two faces: a behavioral one and an attitudinal one. First, a loyal client behaves positively towards the firm, generating frequent visits and substantial spending (relative to his needs). Second, a loyal client expresses a positive attitude towards the firm, i.e., favorable opinions if surveyed and positive word-of-mouth. Consequently, we will say that a client is loyal when both facets positively exist. We are mistaken when we ignore one of them and this is the reason why we misunderstand the relationship between satisfaction and loyalty. Client satisfaction results from a gap between a client’s expectancies and the perceived performance of the company. Satisfaction then increases when the firm improves or when the client’s level of expectancies is low. However, when the firm improves, the client’s expectancies automatically increase.

²In fact, firms can be sure that after the customer satisfaction good start is over, the client will

¹ Reichheld F. (1996), *The Loyalty Effect*, Harvard Business Scholl Press.

² Yannick Poubann, 2000; “How to Switch from Client Satisfaction to Client Loyalty?” France.

begin seeing their imperfection and thinking about other potential offers. So after getting the customers' satisfaction, businesses' biggest challenge is to keep the client, loyal with them.

II.5.a. Managing customers' loyalty:

When customers get what they wanted and what they expected from the product/ service, which they buy; and when they have been satisfied from that product/ service they will reuse this product another time; but this evidence doesn't make an automatic link between the satisfaction and the loyalty of customers. By the way some studies announced that the satisfaction of customers is declared by the consumers themselves. The satisfaction and the loyalty of a customer are not related by a strong link; especially with the multifactor and the complex consumer buying behavior; moreover consumers don't behave only according to the product's value or only the needs' power, but also according to their value and to their attitudes of confidence and so many other aspects of the customer buying behavior, whom have been discussed in this research.

Firms need to follow their customers' transactions, and constitute databases about those customers; this can be achieved through using market orientated business system which must include customer loyalty management system, Brian kovacs responsible of Information Technology (IT) and vice-president of walker information says that *if a Customer Relationship Management system (CRM) doesn't contain the Customer Loyalty Management (CLM) it won't be efficient of the company who uses it, because it won't work how it was planned to*. He affirms also that *the Customer Loyalty Management (CLM) is an essential component of Customer Relationship Management (CRM); and that because of some principal advantages of Customer Loyalty Management such as the following ones:*

It helps the firms obtain information about their customers, and that considers every type of information.

It helps the companies also know and evaluate the good time to execute either the up-sell or the cross-sell.

It helps also the firms know exactly what should they do? And what are the good ways to get more benefits of customers to make them loyal?

It helps the organizations evaluate their good customers, and their most loyal customers. And so on...¹

Moreover; The survival, the growth and the profitableness are very attached with the customer value for the organizations, but they focus on the customers' satisfaction, and their loyalty for the firm, because getting a new customers is easy, but keeping them with us is the focal point of marketing and of the whole business functions and systems, whatever; that is why businesses owners created the customer relationship management for. The central objective of the

¹ http://www.cisco.com/web/PT/assets/docs/5_ways_to_improve_customer_responsiveness.pdf

customer relationship management is absolutely the loyalty of customers, because the loyal customers are more gainfully than new customers. These reasons and others have given the CRM's importance on today's firms' a cross-functional business systems, such as ERP (enterprise resources planning) and supply chain management (SCM), and that what we will see clearly on the next chapter. But now we have to see some of the loyalty's advantages for the firm, thus; customers' loyalty is an important component and a focal objective also for creating a Customer Relationship Management. As **Gray, Matear, Bashoff & Matheson (1998)** note, a company should not only analyse customer needs and share that knowledge within the organization, but must act on it.¹

It has always been the conventional wisdom that customer loyalty is the key success factor in the development of superior market performance. What is remarkable is that research in strategy and marketing only recently has been recognized the huge impact customer loyalty in fact has in long term profitability. Traditional marketing paradigms more or less consider the relationship aspect to be an adjunct to the core marketing theories rather than an integrated element of central business process. On this chapter we have seen the most popular definitions of customer, and we discussed also the consumer buyer behavior with its types and the major factors that influence this behavior, and later; we talked about the customers' satisfaction and its relationship with the loyalty of customers; and as conclusion we have seen that the loyalty of customers is an central component and it's also an important objective for any firm, because it is the core of the whole business process, so firms must manage their customers loyalty if they want to grow their business' benefits.

II.6. Market Orientation and Innovation:

Generally, market orientation is concerned with the processes and activities associated with creating and satisfying customers in a way that influence the business performance. Kohli and Jaworski who led the research stream in the early 1990' s as well as Narver and Slater (1990)² brought to the literature a definition about market orientation describing it as a set of behaviors and activities in an organization. They stated that "the organization-wide generation of market intelligence pertaining to current and future customer needs dissemination of the intelligence across departments and organization-wide responsiveness to it" (Kohli & Jaworski 1990, pp. 6)³. The definitions and meanings of the term 'market orientation' as used by different authors are somewhat diverse.

¹ Gray, B.J., Matear, S., Boshoff, C., Matheson, P.K. (1998), "Developing a better model of market orientation", *European Journal of Marketing*, Vol. 32 No.9, pp.884-903.

² Narver J.C, S.F. Slater (1990). "The effect of a market orientation on business profitability". *Journal of Marketing*;54: 20–35.

³ Kohli, A. and Jaworski, B. (1990), "Market orientation: the construct, research propositions, and managerial implications", *Journal of Marketing*, Vol. 54, pp. 1-18.

Narver and Slater (1990) and **Kohli and Jaworski** (1990) have agreed that a market orientation includes both a customer and competitor orientation, as well as market information sharing. It uses the construct of market information sharing rather than **Narver and Slater's** (1990) broader construct of interfunctional co-ordination. This is because it has been argued that **Narver and Slater's** conceptualisation is too broad, with measures that do not tap specific behaviors that represent a market orientation (Kohli, Jaworski & Kumar 1993)¹. In addition, **Kohli and Jaworski** (1990) found from extensive qualitative research that interfunctional co-ordination should be limited to 'co-ordination related to market intelligence'. The term market information sharing equates closely to what **Kohli, Jaworski and Kumar** termed 'intelligence dissemination' (1993, p. 476).²

*The survey results in the literature provide evidence for the basic propositions that market orientation influences firm innovativeness and firm performance. Within marketing, there has been great interest in market orientation as an intangible factor that has an effect on organizational performance (Homburg et al., 2003).*³

The customer orientation component itself is viewed as having two sub-components. The first relates to customer analysis, that is, a deliberate emphasis on understanding customer needs and wants. The second is customer responsiveness: responding to the information received about customer needs and preferences.
⁴ *The role of linking market orientation and Innovation in successful company development will have increasingly greater role in theoretical researches (Berthon et al)*⁵.

It has been widely accepted that firms with higher market orientation obtain better results, researchers have extensively collected empirical evidence of the strong positive effects of market orientation on the firms' performance, and this fact yielded a growing interest in the concept of market orientation for researchers and companies in different levels. **Lado and Maydeu-Olivares** (2001) summarized these empirical results in Table 10. **Lambin** (1996)⁶ declared that *it is not yet clear why there is such effect and how it operates, while the most recent literature highlights that one of the keys to understand this phenomenon comes from the market*

¹ Kohli, A., Jaworski, B. and Kumar, A. (1993), "MARKOR: A measure of market orientation", Journal of Marketing Research, Vol. 30, pp. 467-477.

² <http://www.accessmylibrary.com/article-1G1-126933668/effects-upstream-market-orientation.html>; march 6th; 2010.

³ Homburg, C., Krohmer, H., Workman, J. P., J.R., (2003) "A Strategy Implementation Perspective of Market Orientation", Journal Of Business Research, In Press, Corrected Prof, cited in: Erdil S., erdil o. And keskin h. "The relationships between market orientation, firm innovativeness and Innovation performance", Journal of Global Business and Technology

⁴ Dawes, John; 2000; "Market Orientation and Company Profitability: Further Evidence Incorporating Longitudinal Data.(Statistical Data Included)";Australian Journal of Management. Australia.

⁵ Berthon, P. Hulbert, J. M. – Pitt, L. F., "To Serve or Create? Strategic Orientations Toward Customers and Innovation", California Management Review., 42 No. 1 (1999). Cited in Ildikó petruska (2004) "R&D-marketing integration in the new product Development process" periodica polytechnica ser. Soc man.

⁶ Lambin, J. (1996), "The misunderstanding about marketing, today; marketing is too important to be left to sole marketing function. An empirical study in the private insurance sector", CEMS Business Review, Vol. 1 No. 1-2, pp. 37-56.

orientation's positive effect on Innovation (Atuahene-Gima ¹, 1996; Gatignon and Xuereb², 1997; Hurley and Hult, 1998³). "Kohli and Jaworski (1990) provided a useful interpretation of the marketing concept and a market orientation from a behavioral process " and they defined market orientation as the organization-wide generation of market intelligence pertaining to current and future customer needs, dissemination of intelligence across departments and organization-wide responsiveness to it.⁴ "Market orientation is vital to companies and because of the increasing competition which is getting fiercer and fiercer everyday and also because the changes in consumer needs companies have realized that they must stay closer to their markets" (Greenwald, 1991).⁵

Table 10: Summary of empirical research on the relationship between market orientation (MO) and business performance (BP)⁶

Author(s)	Country	Conclusions
Narver and Slater, 1990	USA	Positive relation MO-BP
Ruekert, 1992	USA	Positive relation MO-BP
Jaworski and Kholi, 1993	USA	Positive relation MO-BP
Kholi, Jaworski and Kumar, 1993	USA	Positive relation MO-BP
Diamantopoulos and Hart, 1993	UK	Mixed results about MO-BP relation
Slater and Narver, 1994	USA	Positive relation MO-BP
Deng and Dart, 1994	Canada	Positive relation MO-BP
Deshpandé, Farley and Webster, 1993	Japan	Positive relation customer orientation-BP
Van Bruggen and Smidts, 1995	The netherlands	Positive relation MO-BP
Greenley, 1995	UK	Positive relation MO-BP
Lambin, 1996	Belgium	Positive relation MO-BP
Fritz, 1996	Germany	Positive relation MO-BP
Pitt, Caruana and Berthon, 1996,	UK, Malta	Positive relation MO-BP in both countries
Selnes, Jaworski and Kohli, 1996	USA, Scandinavia	Positive relation MO-BP
Pelham and Wilson, 1996	USA	Positive relation MO-BP
Atuahene-Gima, 1995, 1996	Australia	MO is an important factor in new products success
Bhuiyan, 1997	Saudi Arabia	Non-significant relation MO-BP
Gatignon and Xuereb, 1997	USA	Different strategic orientations have different impact on Innovation performance according to market characteristics
Greenley and Foxall, 1997, 1998	UK	The impact of multiple stakeholder orientation on performance is moderated by the external environment
Gray <i>et al.</i> , 1998	New Zealand	Positive relation MO-BP
Caruana, Pitt and Berthon, 1999	UK	Non-significant relation MO-BP
Avlonitis and Gounaris, 1997	Greece	Positive relation MO-BP
Lado, Maydeu-Olivares and Rivera, 1998	Spain, Belgium	Positive relation MO-BP
Kumar, Subramanian and Yauger,	USA	Positive relation MO-BP

¹ Atuahene-Gima, K. (1996), "Market orientation and Innovation", Journal of Business Research, No. 35, 93-103.

² Gatignon, H. and Xuereb, J. (1997), "Strategic orientation of the firm and new product performance", Journal of Marketing Research, Vol. 34, 77-90.

³ Hurley, R. and Hult, T. (1998), "Innovation, market orientation and organizational learning: an integration and empirical examination", Journal of Marketing, Vol. 62, 42-54.

⁴ Kohli A., Jaworski B.J., "Market Orientation: The Construct, Research Propositions and Managerial Implications" Journal of Marketing Research, 1990, Vol. 54: 1-19. cited in: Erdil S., Erdil O. and Keskin H. "The relationships between market orientation, firm innovativeness and Innovation performance", Journal of Global Business and Technology.

⁵ Greenwald, J. (1991), "World insurance congress: global insurers told to put customers firsts", Business Insurance, Vol. 25 No. 8, pp. 3-4.

⁶ Lado N. and A. Maydeu-Olivares, (2001) "Exploring the link between market orientation and Innovation in the European and US insurance markets"; International Marketing Review. Vol. 18 No. 2, 2001, pp. 130-144.

1998 Appiah-adu, 1998 Deshpande and Farley, 1998 Han, Kim and Srivastava, 1998 Sargeant and Mohamad, 1999 Baker and Sinkula, 1999 Pelham, 2000	Ghana USA, EU USA UK USA USA	Positive relation MO-BP Positive relation MO-BP Positive relation MO-Innovation-BP Non-significant relation MO-BP Positive relation MO-BP Positive relation MO-BP
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Source: Lado N. and A. Maydeu-Olivares, (2001)

Several studies have supported an association between market orientation and profitability the link between market orientation and Innovation appears to be more complex (Martin and Grbac, 2003¹; Slater and Narver, 2000²). **Slater and Narver** (1995)³ declared that *market orientation may improve business performance if it is mixed with a learning orientation, and that market-driven business is well positioned to anticipate the needs of customers because of its external emphasize on developing information about customers and competitors. This ability offers the market-driven business an advantage in the speed and effectiveness of its response to opportunities and threats, and then a market orientation is inherently a learning orientation*, from this we can see the **Slater and Never’s** view of the relationship between market orientation and business performance. This view has been taken in account by **Hurley and Hult** (1998)⁴ when they have explicitly provided a theoretical framework linking market orientation, business performance and Innovation. They have also pointed out that there are two statements in **Slater and Narver’s** view, and they can be cited as the following:

- A. market orientation and learning orientation are inherent and inseparable;
- B. a learning orientation mediates the market orientation performance relationship.

Despite the fact that marketing theory is deeply based upon the market orientation and customer orientation concepts only recently have operational definitions of market orientation been developed (Narver and Slater, 1990⁵; Kohli and Jaworski, 1990⁶). Besides, the real meaning of the market orientation concept is still under a serious debate. In the academic discussion of market orientation, two different concepts seem to overcome,

The first one considers market orientation as a company culture, while the second one views market orientation as fundamentally a specific set of behaviors. Market orientation is the

¹ Martin, J.H., Grbac, B., (2003) “Using Supply Chain Management to Leverage a Firm’s Market Orientation”, Industrial Marketing Management, Vol. 32: 25-38.

² Slater, S.F., Narver, J.C. (2000), “Market Oriented is More Than Being Customer-Led”, Strategic Management Journal, Vol: 20.

³ Slater SF, JC Narver; (1995); “Market orientation and the learning organization”. Journal of Marketing ;59: 63–74.

⁴ Hurley, R. and Hult, T. (1998), “Innovation, market orientation and organizational learning: an integration and empirical examination”, Journal of Marketing, Vol. 62, 42-54.

⁵ Narver J.C., S.F. Slater (1990). Op Cited.

⁶ Kohli, A. and Jaworski, B. (1990), Op Cited.

business culture that produces performance by creating superior value to customers (Slater and Narver, 2000).¹

Market orientation has been characterized as a culture of the organization that requires customer satisfaction be put at the centre of business operations (Liu et al, 2002)² and therefore produces superior value for customers and outstanding performance for the firm.³

Market orientation, as a type of company culture, refers to a specific set of organizational values where a market oriented organization places the highest priority on the profitable creation and maintenance of superior customer value (Narver and Slater, 1990⁴; Slater and Narver, 1995⁵).

Kohli and Jaworski (1990)⁶ have introduced the market orientation concept as a specific set of behaviors, they said in their words: *“Market orientation is the organization-wide generation of market intelligence pertaining to current and future customer needs, dissemination of the intelligence across departments, and organization-wide responsiveness to it”*.⁷ **Deng and Dart** (1994)⁸ defined market orientation as *the implementation of a particular business philosophy, the marketing concept, which we will get through it in this chapter mainly because Innovation is strongly linked to Innovation, moreover and as Drucker and Maciariello* (2008) announced *“There is only one valid definition of business purpose: to create a customer.”... And, “Because the purpose of business is to create a customer, the business enterprise has two – and only two basic functions: marketing and Innovation. Marketing and Innovation produce results; all the rest are costs”*⁹. On the other hand, **Lambin** (1996)¹⁰ and **Lado et al.** (1998)¹¹ have defined market orientation as: *“A competitive strategy geared to generating and maintaining a situation in which there is a value exchange with the firms’ markets”*. This exchange according to **Lambin** (1996) yields *positions which lead to loyalty to the brand and to the product and high economic returns to the firm* (Lambin, 1996).¹² The environment’s effects have been also included in the concept of market orientation from **Lambin’s** and **Lado’s et al** views. Their definition of market orientation also takes into account that company competitiveness depending on the share of resources and materials to obtain and analyse information which are

¹ Slater, S.F., Narver, J.C., 2000 Op Cited

² Liu, S.S., Luo, X., Shi, Y., “Integrating Customer Orientation in Organizations –in- Transition: An Emprical Study”, International Journal of Research in Marketing, 2002, Vol. 19: 367-382. Cited in: Erdil S., erdil o. And keskin h. “The relationships between market orientation, firm innovativeness and Innovation performance”, Journal of Global Business and Technology.

³ Erdil S., erdil o. And keskin h. “The relationships between market orientation, firm innovativeness and Innovation performance”, Journal of Global Business and Technology.

⁴ Narver J.C, S.F. Slater (1990), Ibid.

⁵ Slater SF, JC Narver; (1995); Op Cited

⁶ Kohli, A. and Jaworski, B. (1990), Op Cited

⁷ Kohli, A. and Jaworski, B. (1990), Idem

⁸ Deng, S. and Dart, J. (1994), “Measuring market orientation: a multi-factor, multi-items concept”, Journal of Marketing Management, No. 10, pp. 725-742.

⁹ Drucker, P. F, & J. A. Maciariello. (2008). “Management”: revised edition. New York: Harper Collins. p 30.

¹⁰ Lambin, J. (1996), “The misunderstanding about marketing, today; marketing is too important to be left to sole marketing function. An empirical study in the private insurance sector”, CEMS Business Review, Vol. 1 No. 1-2, pp. 37-56.

¹¹ Lado, N., Maydeu-Olivares, A. and Rivera, J. (1998), « Measuring market orientation in several populations: a structural equations concept », European Journal of Marketing, Vol. 32 No. 1/2, pp. 23-39.

¹² Lambin, J. (1996), Ibid.

used to design plans of action related to market actors in ways that benefit the firm. The “analysis” and “strategic actions” components are taken into consideration for each of the four market participants previously described, and are based on the organizational component of “coordination”. Lado et al (1998) have summarized four different theoretical conceptions of market orientation by listing their respective components like follows.

Table 11: Alternative conceptions of market orientation

Authors	Components of market orientation
Kohli and Jaworski (1990)	Generation of market intelligence Dissemination of market intelligence Entire organization’s capacity to respond
Narver and Slater (1990)	Customer oriented Competitor oriented Inter-functional coordination
Deng and Dart (1994)	Customer oriented Competitor oriented Inter-functional coordination Profit oriented
Lambin (1996) and Lado, Maydeu-Olivares and Rivera (1998)	Information gathering and analysis on: ➤ final customers ➤ distributors ➤ competitors ➤ environment Inter-functional coordination Strategic actions on: ➤ final customers ➤ distributors ➤ competitors ➤ environment

Source: Lado N. and A. Maydeu-Olivares, (2001) ¹

III. Interaction between Marketing and Innovation

As a third section of this chapter, we speak about the relationship and interaction between marketing and innovation; we attend to take the following sub-titles within this section: 1) Interdepartmental integration; 2) Marketing and R&D linkage during NPD projects; 3) The relationship between Marketing and Innovation; 4) Marketing barriers to Innovation.

III.1. Interdepartmental Integration:

Today, more than ever, there is a need for the integration of decisions made in other departments. By the very nature of them, marketing policies will impose on other departments

¹ Lado N. and A. Maydeu-Olivares, (2001) “Exploring the link between market orientation and Innovation in the European and US insurance markets”; International Marketing Review, Vol. 18 No. 2, 2001, pp. 130-144.

and conflict will inevitably arise but this has to be managed in the interests of the organization as a whole. Some literature defined interdepartmental integration as the interaction perspective, where meetings and information exchange predicate marketing's relationships among departments (e.g. Ruekert and Walker (1987)¹; Griffin et al (1992)²; Moenaert et al (1994)³) the meetings among different departments may improve the knowledge, expertise and skills exchange between departments and function within the firm, and for the reason that the marketing department is the one which is near to customers and is the one which is able (to a certain degree) to know the customers' needs and expectations, and then it is the one which may help other departments such as R&D and manufacturing departments doing their functions in a better way, while some other literature has ascribed to a collaboration perspective where teams share resources and knowledge to work together in ways to achieve the firms goals (e.g., Lawrence and, Lorsch, 1986⁴; Schrage, 1990⁵; Clark and Fujimoto, 1991⁶) and a third part of the literature has suggested that integration is composite of interaction and collaboration. Much of the traditional marketing literature tends to overlook integration from an interdepartmental perspective, where the focus in the integration of marketing's strategies with other departments' strategies (Wind 1981⁷; Ruekert and Walker 1987⁸). **Kahn** (1996)⁹ examined the nature of 'integration' and how it was characterised in past research. He found that a significant proportion of this literature has focused on interaction, while others have seen integration as collaboration.

In the literature of interdepartmental integration, it has been also suggested that successful and good integration between marketing and other departments contributes to successful firm's programs (Souder 1987¹⁰, Urban and Hauser 1993¹¹, Olson et al 1995¹²). Improved interdepartmental integration yields improved development performance, mainly for the reason that the integration and collaboration between departments will positively affect the

¹ Ruekert, Robert W., and Walker, Orville C, Jr. (January 1987) "Marketing's Interaction with Other Functional Units: A Conceptual Framework and Empirical Evidence". *Journal of Marketing* 51 1-19.

² Griffin, Abbie, and Hauser, John R. (March 1992): "Patterns of Communication among Marketing, Engineering, and Manufacturing: A Comparison Between Two Product Teams". *Management Science* 38; 360-373.

³ Moenaert, Rudy K., Souder, William E., DeMeyer, Arnoud, and Deschoolmeester, Dirk, (January 1994): "R&D-Marketing Integration Mechanisms, Communication Flows, and Innovation Success" *Journal of Product Innovation Management* 11; 31-45.

⁴ Lawrence, Paul R., and Lorsch, Jay W. (1986): *Organization and Environment* "Managing Differentiation and Integration". Harvard Business School Press, Boston, Massachusetts, US.

⁵ Schrage, Michael: *Shared Minds*, (1990): Random House, New York, New York, US.

⁶ Clark, Kim B., and Fujimoto, Takahiro: *Product Development Performance*, (1991); "Strategy, Organization, and Management in the World Auto Industry. Harvard Business School Press, Boston, Massachusetts, US.

⁷ Wind, Yoram (1981); "Marketing and the Other Business Functions", *Research in Marketing* 5, 237-264.

⁸ Ruekert, Robert W., and Walker, Orville C, Jr. (1987); *Ibid*

⁹ Kahn, K. (1996); "Interdepartmental integration: A definition with implications for product development performance". *Journal of Product Innovation Management*; pp 137-151.

¹⁰ Souder, William E. (1987); "Managing New Product Innovations"; Lexington Books, Lexington, MA..

¹¹ Urban, Glen L., and Hauser, John R. (1993): *Design and Marketing of New Products*, 2nd ed., Prentice Hall, Englewood Cliffs, NJ.

¹² Olson, Eric M., Walker, Orville C., Jr., and Ruekert, Robert W. (January 1995); "Organizing for Effective Product Development: The Moderating Role of Product Innovativeness"; *Journal of Marketing* 59: 48-62.

firm's performance.¹ According to **Elias Kyriazis** (2005) *"The working relationship between functional specialists during new product development (NPD) activities has long been recognised as a problematic area for top management with new product failure often attributed to low levels of integration between the Marketing function and R&D function"*.²

Interdepartmental integration then is a very helpful tool that facilitates team work, information and knowledge transfer between the different departments within the firm, so that it might play an important role in the firm's innovativeness and Innovation performance for the firm, Interdepartmental integration has been defined by **Kahn** as *a process that includes interdepartmental collaboration and interdepartmental interaction; where Interdepartmental interaction is characterized as the information exchange element of integration, while Interdepartmental collaboration is considered as the affective and mutual element of integration, corresponding to a willingness to work together. We our last chapter we will show the interdepartmental integration affect either on firm innovativeness or on Innovation performance, as well as business performance.*

III.2. Marketing and R&D linkage during NPD projects:

Marketing's cross-functional relationships have become an important focus of academic research, since Ruckert and Walker's (1987)³ study, confirmation of this can be found in the massive literature studying marketing relationships and integration with other departments (e.g., Dawes and Massey, 2005; Fisher, Maltz, and Jaworski, 1997; Workman, Homburg, and Gruner, 1998)⁴. And moreover, New Product Development (NPD) activities necessitate harmonized working relationships between functional departments and specialists, these working relationships have long been recognised as problematic areas for firms management with new product failure often attributed to low levels of integration between the Marketing function and other departments and functions and especially Research and Development (R&D) function (Griffin and Hauser 1996)⁵. Empirical evidence clearly shows the positive impact of the successful integration between Marketing and R&D functions on new product launching and success rates (Cooper and Kleinschmidt 1987)⁶. Executives always try to increase the volume of communication within and between the different functions during the NPD activities; this communication which occurs in several ways (e.g, meetings, documentation transfer, telephone calls,

¹ Kahn b. Kenneth; (1996) ; Ibid.

² Kyriazis E. (2005) ; « The Effectiveness of the R&D/Marketing Working Relationship during NPD projects », ANZMAC Conference: Entrepreneurship, Innovation and New Product Development.

³ Ruckert, R.W., O.C. Walker; (1987); "Marketing's interaction with other functional units: A conceptual framework and empirical evidence"; Journal of Marketing, Vol 51, 1-19. cited in Massey G. R. and E. Kyriazis; (2006); "Communication and Conflict between Marketing and R&D during New Product Development Projects"; published for the conference of the Australian and New Zealand Marketing Academy.

⁴ Massey, G.R. & Kyriazis, E. 2006, 'Communication and conflict between marketing and R&D during new product development projects', published for the conference of the Australian and New Zealand Marketing Academy.

⁵ Griffin, A. and J, R. Hauser. (1996); "Integrating R&D and Marketing: A review and analysis of the literature". Journal of Product Innovation Management; pp 191-215.

⁶ Cooper, R. G. and E. J Kleinschmidt. (1987); "New products: What separates winners from losers. Journal of Product Innovation Management"; pp 169-184.

conferences...) has been theoretically and empirically recognized to have a positive effect on reaching truly effective working relationships between (Griffin and Hauser 1996)¹.

Jones and George (1998)² through their studies on teamwork, they found a positive effect of the existence of trust on several social processes such as the free exchange of knowledge and information, communal understanding of the firm's objective, higher involvement in processes and so on...

Intra- and interdepartmental communication is included because it is a key variable affecting many types of relationships (Ruekert and Walker, 1987³) and is defined as the intensity of information flows between the Marketing function and the R&D function via means such as formal meetings, reports, and telephone conversations (Van de Ven and Ferry, 1980⁴). **Moenaert and Souder**, (1992) noticed that *communication quality in terms of how credible, understandable, relevant, and useful information provided by the Marketing function was for the R&D function's task completion* (Moenaert and Souder, 1992)⁵.

NPD projects necessitate a good linkage between marketing function and R&D function in order to ameliorate the new product to reach the customer's needs through several aspects of interdepartmental integration which appears in so many ways (e.g., effective communication, behavioral trust, problem solving, and mutual business' purpose understanding...). *There is a tendency to view the relationship and interdepartmental integration between Marketing function and R&D function as productive for the firm during NPD projects because of the collaborative behavior which occurs amongst managers* (Kahn and Mentzer 1998)⁶.

Trust is vital in cross-functional relationships; thereby, executives must improve trust between employees in each department, to enhance the interdepartmental integration for the different functions within the firm, this might help improving effectiveness through coordinating actions between the departments (McAllister 1995)⁷.

During NPD projects a huge amount of conflicts can be found between the personal staff of the firm's different departments (mainly between Marketing and R&D) because of conflicting goals and priorities, this fact obliges executives to resolve those conflicts and limit them in earlier phases or at least manage it in ways to profit from those conflicts (for further reading see

¹ Griffin, A. and J. R. Hauser. (1996); Ibid.

² Jones, G. R. and J. M. George (1998); "The experience and evolution of trust: Implications for cooperation and teamwork"; Academy of Management Review; pp 531 -546.

³ Ruekert, Robert W., and Walker, Orville C, Jr. (1987); Ibid.

⁴ Van de Ven, A. H., and D. L. Ferry, (1980); "Measuring and assessing organizations" John Wiley and Sons. New York; US.

⁵ Moenaert, R.K., W.E. Souder, A. De Meyer, and D. Deschoolmeester, (1994); "R&D Marketing Integration Mechanisms, Communication Flows, and Innovativeness". Journal of Product Innovation Management, 11, 1, 31-45.

⁶ Kahn, K. and J. T. Mentzer, (1998); "Marketing's integration with other departments"; Journal of Business Research; 42(1); pp 53-62.

⁷ McAllister, D. J. (1995); "Affect- and cognition - based trust as foundations for interpersonal cooperation in organizations". Academy of Management Journal. 38(1): 24 -59.

Menon et al 1996¹) through enhancing communication and teamwork between and within the different departments. According to **Menon et al** (1996) *Functional conflict yields consultative interaction, with useful give-and-take among organizational members, where opinions and feelings are expressed freely, and where there is a willingness to consider new ideas and changes.*² **McAllister** (1995) found that *executives expressing high-affect based trust looked for more opportunities to meet their peers' work-related needs and to engage in more productive intervention in task-related situations thus warranting its inclusion in this study.*³

III.3. The relationship between Marketing and Innovation:

Just as we have already noticed For **Drucker** *the business enterprise has two and only two basic functions which are Marketing and Innovation while the other functions are taken as costs only, the business purpose is to create customer and then firms must at first find those customers, know their needs and desires and then work in ways that fulfill those needs, so that marketing and Innovation can be the only way to create value through creating customers*⁴ (Drucker and Maciariello 2008, p. 30). In this work we shall use **Drucker and Maciariello's** (2008) conceptualization and view of the relationship between marketing and Innovation. **Drucker** has also introduced an integrated system which we call the **Drucker's** management system where the author demonstrated how the two functions (marketing and Innovation) are implemented together in the same system. (See figure 15 which follows).

In this section we adopt **Drucker and Maciariello's** (2008) conceptualization of the relationship between Marketing and Innovation, which appears in the **Drucker's** Management system (see Figure 1 above); Figure 1 integrates several components of business management which is mainly built upon some vital concepts, in the Drucker's Management system, **Drucker** gathered in such an organized way several concepts such as Innovation, the environment, organization structure, core competencies, strategies, work assignments and the expected results, **Drucker's** view of management system can be used by organizations to develop and validate its specific theory of the business.

Michael Porter also (1990) has also implied the need to distinguish between invention and Innovation. He writes that Innovation is defined as: 'a new way of doing things (termed invention by some authors) that is commercialized'⁵. From Porter's strategic perspective,

¹ Menon, A., Bharawadj, S. G. and Howell, R. (1996); "The quality and effectiveness of marketing strategy: Effects of functional and dysfunctional conflict in intraorganizational relationships"; *Journal of the Academy of Marketing Science*. 24(4); pp 299-313.

² Menon, A., Bharawadj, S. G. and Howell, R. (1996); *Idem*.

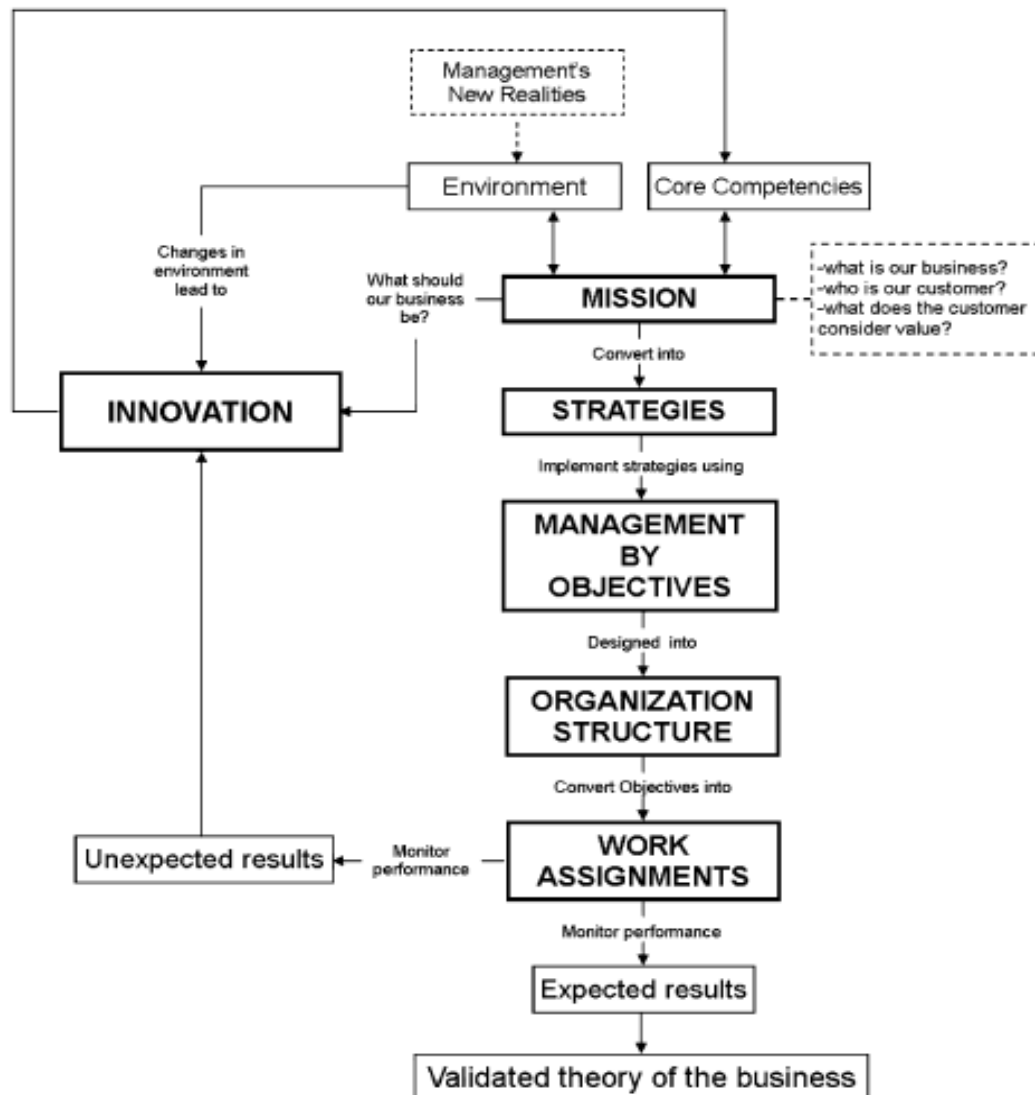
³ Stated in Kyriazis E. (2005), *Ibid*

⁴ Drucker, P. F. & J. A. Maciariello. (2008). "Management": revised edition. New York: Harper Collins. p 30. cited in "Joseph Maciariello, (2008) "Marketing and Innovation in the Drucker Management System", *Journal of the Academy of Marketing Science*; CA, USA."

⁵ Porter, M. E. (1990) *The Competitive Advantage of Nations*, New York, The Free Press. p 780.

inventions need to be commercialized and here comes the marketing role in the Innovation process. A 'new way of doing things' need not be the result of a new piece of equipment. However, devising or discovering 'a new way of doing things', a new product or service, is not on its own a sufficient condition for a profit-making organization to make a profit, or for a non-profit-making organization to achieve its aims and objectives more effectively. New processes, products and services must also be put to a productive commercial use. The point is that Innovations are of practical use in providing new or improved products or services and/or enabling people and organizations to do things more effectively and/or efficiently.

Figure 15: Marketing and Innovation in the Drucker Management System.



Source: Drucker, P. F, & J. A. Maciariello. (2008).

Inventors, organizational or individual, can only benefit from inventions which they can exploit for gain. It is; perhaps, appropriate here to stress the difference between product and process Innovation. Product Innovation relates to the development of a new product. However, when an organization adopts this Innovation to enable it to perform its operations more effectively

and efficiently, it can be classed as a process Innovation. In effect it is impacting on the process of the organization's activities. Keep in mind that what may be innovative for one organization may be 'old hat' for another.

Process Innovation is not confined to the use of new equipment in an organization but, as **Porter's** definition of Innovation suggests, can also refer to a new way of doing things. It is therefore important to remember that when we refer to technology in this unit, we are defining it in its widest possible sense to include new equipment, machinery and internet technologies, as well as new ways of organising work, bound up in the systems, processes and procedures of an organization and not necessarily involving physical equipment and products.¹

After identifying very well its mission, the firm should oblige the executives to evaluate the environment's movements which are happening in the actual time, and which might have either a positive or a negative effect on the firm and its activity performance, after making a useful environment analysis, the firm and its executives might then characterize the Innovation opportunities and threats which may influence the activity and the success of an organization.²

Benhabib (2006)³ noticed that executives and firms' employees must also understand what the organization is good at; like that they may know the core-competencies of the firm when creating the firm's mission that answers some key questions such as what is our business? What are our objectives and expected results? What can the firm do? Who is our customer? What should our business be? What does the customer consider value? As well as several other questions.

Many authors and theorists put marketing and entrepreneurship as helpfully involved in defining the mission of the firm, rather than something that happens as part of a process of strategy implementation.). According to **Drucker** and **Maciariello** (2008) *one competency that all competencies must have is the competency of Innovation, preferably systematic Innovation which is the main source to create value if used and applied in such a coordinated way with other functions and competencies mainly marketing. Firms then must make strategic and tactic decisions which are implemented in ways to achieve the firm's objectives and mission.* A firm's strategy is then built on specific objectives with budgets developed; people assigned; and expected results established for each project of that firm. **Drucker** and several other authors have introduced objectives as the vehicle for the implementation of strategy. Management by Objectives (MBO) is taken as a well-defined methodology that facilitate teamwork and as a philosophy which align all the individuals and units of an organization with the organization's theory of the business. MBO

¹ <http://openlearn.open.ac.uk/course/view.php?id=2898> , june 2010.

² Adopted from " Abderrezak BENHABIB, (2006), "l'économie de l'entreprise", l'office des publications universitaires, Alger, Algerie.

³ Idem.

necessitates a good-working communication system that insures the clear picture of all the executives and employees for the company about the firm's main and sub-objectives, employees have to understand how they work, they must also understand how other employees around them work so they can help these people maximize their contributions to results and they also can acquire skills that will prepare them for the future. Such a communication system allows the firm's units and departments interact with one other in ways that smooth the progress of the firm's activity. MBO thus seeks to meld individual freedom and responsibility with organizational performance and results. It rests on a high concept of human motivation and behavior. Detailed objectives are first set for marketing; for existing and new products and services in current markets; for abandonment of existing products; for distributive organizations; for service standards; and for credit standards. Marketing decisions are made for desired segments (i.e., concentration objectives) and for market share.

Marketing objectives are followed by detailed objectives for Innovation; for product and service Innovation; for managerial Innovation; and for social Innovation. Thus, marketing objectives emphasize how the organization can better serve current markets while Innovation objectives emphasize how the organization can create new markets. Innovation objectives are set to answer the question posed in the theory of the business: And what should our business be? Importantly, the development of marketing and Innovation objectives occurs first, and before the development of objectives three to eight, which relate to human resources, financial resources, physical resources, productivity, social responsibility and profit.¹ Marketing and Innovation play also a key role in the development of an organizational structure which help executives implementing the firm's objectives.

Drucker states *"from the inside it is not easy to find out what a business gets paid for; organized attempts to look at one's business from the outside are needed"* (Drucker 1964).² Marketing and Innovation are very closely linked and interrelated in the Drucker Management System. Here is how he describes the linkage: *..."businessmen will have to learn to practice "marketing" as an innovative force in itself. They have to learn that the truly new does not; as a rule satisfies demands that already exist. It creates new expectations, sets new standards, and makes possible new satisfactions. 'Innovative marketing' therefore creates markets. New technology always needs new markets which were not even conceivable until the new technology created new demands"* (Drucker 1969).³

According to **Maciariello** (2008) *leaders who are committed to doing the right thing and to getting the right things done, and who possess integrity of character; have a vision for the purpose of their*

¹ Joseph Maciariello, (2008). OP Cit

² Drucker, P. F. (1964). "Managing for results". New York: Harper & Row, p. 91. cited in Joseph Maciariello, (2008). OP Idem.

³ Drucker, P. F. (1969). "The age of discontinuity". New York: Harper & Row, pp. 52-53. Cited in Joseph Maciariello, (2008). Ibid.

organization; focus on opportunities; are change leaders; and follow essential tasks, responsibilities, and practices of management. Executive skills, practices of effective executives, and executive tasks are acquired through knowledge and experience. Executive skills, executive tasks, and executive practices must be combined into principles of effectiveness in order to implement an enterprise's theory of the business. Executive principles must be directed toward developing and maintaining a high spirit of performance, achieving organizational results, and managing social impact to derive the common good. Executives must do some basic things in order to attain such a good spirit of performance within the organization they work for such as the need to:

- *Exhibit high levels of integrity in their moral and ethical practices.*
- *Focus on results.*
- *Build on strengths-one's own and others'.*
- *Lead beyond borders to meet at least minimum requirements of all stakeholders, including customers, employees, shareholders, and the public, thereby serving the common good.¹*

III.4. Marketing barriers to Innovation:

There exist so many barriers to Innovation, including economic, organizational, and cultural barriers, but in our research we are going to take the example of marketing barriers to Innovation in ways to specify our research because if we're going to talk about all those barriers we will get stuck in the middle and will probably never get done with this research, by the way, as we will see, Marketing barriers to Innovation include some kinds of the other barriers too, so we will try to make it as short but clear as we can; however according to several researches in this domain, marketing barriers to Innovation can be classified into two types:

- Barriers to reach the market, and
- Barriers to build a customer base

III.4.a. Market barriers:

This type of marketing barriers faced by firms includes all the barriers that make it hard for firms to convert their ideas into viable and valuable Innovations (products and/or services). The firms then face four barriers while trying to successfully commercialize their Innovations to several adopters within the marketplace. These four barriers can be denoted by the acronym RAMP, which means 1) Regulatory barriers, 2) access (to market) barriers, 3) money (or capital) barriers, and Product development barriers.

¹ Maciariello J, (2008). Idem.

III.4.b. Regulatory barriers:

More than large enterprises; small and medium enterprises generally have to deal with the laws and regulations designed for them by government organizations, furthermore they (SMEs) need to cope with all the environmental factors that minimize the freedom of the firms to make their own decision, enterprises must know then that a “free enterprise” does not mean a “free ride”; *the lack of legal knowledge may well be the biggest constrain of the entrepreneur*¹ (Brown and Colborre 1987).

III.4.c. Access (to market) barriers:

Every company which is developing a new Innovation (product and/or service) is in need to get into the market where it aims to commercialize its Innovation; subsequently entrepreneurs must plan the physical distribution channels of their products from the production unit to the point-of purchase where products become available to the customer. However, a successful new Innovation may fail owing to inadequate reach in the market.

III.4.d. Money (or capital) barriers:

Firms are often aiming to raise their capital, but they almost all the time do not know how to get more financial supports from the available financiers in the market where they work, not only because financiers does not want to offer them their support, but mainly because those firms does not know how to catch the attention of the financiers; firms in fact have to market their ideas newness in their products and/or services to those financiers, to do that firms are often unable to create a good marketing plan for their new Innovations which is vital to attract the financiers.

III.4.e. Product development barriers:

Firms all over the world may face difficulties in transforming their ideas into prototypes and then their prototypes into useful products that might be commercialized into the marketplace, but sometimes product development barriers may be a good competitive advantage mainly because as much as other firms encounter that kind of barriers they become less innovative and especially that they cannot even imitate the new product.

¹ Brown, C A, and Colborne C.H (1987), “legal issues in the new venture development”, in proceedings of the seventh annual Babson College Entrepreneurship Research Conference.

III.4.f. Barriers to build a customer base:

This type of marketing barriers to Innovation take account of all the barriers that are encountered by the firms at the customer level, such as 1) performance value barriers, 2) Image barriers, 3) Compatibility barriers, 4) Trading barriers, and 5) Risk barriers. One, however, can denote those barriers by the acronym PICTR which can be highlighted as follows:

III.4.g. Performance value barriers:

This kind of barriers is created if the customer fails to see and understand an adequate performance to price in the new Innovation (product or service), or if the firm fails in its segmentation, targeting or positioning for the new product, this might happen when firm doesn't have a good knowledge of its market or of its customers. And this barrier can be solved via doing more market research and analysis.

III.4.h. Image Barriers:

This kind of barriers is found due to the complex consumers' belief systems, and especially when customers rely on previous knowledge or ideas when they think of some products or services, names, brands or companies. For instance, we can find customers this that they should never buy from a small, unknown store or company, when they can do so from a larger, well-known one)

III.4.i. Compatibility barriers:

Compatibility barriers can be found, if the new product or service is either incompatible with the standards, or if it does not fit well with the customers' environment, the major limitation that a firm has to overcome is the lack of market orientation in its activities.

III.4.j. Traditional and Cultural Barriers:

Several conflicts with the cultural norms and values of the customers might be confronted by a firm and they are likely to create such a complex barrier for firms (especially for new ones); then firms are obliged to respect and adopt their policies and objectives with the customers' cultural and traditional values.

III.4.k. Risk Barriers:

Customers everywhere want to maintain their health, wealth and peace of mind, but they however cannot do anything without calculating the risk taking, in any step they take, and

especially when it comes to product purchasing. They in fact ask several questions before they make the purchasing decision in order to avoid several kinds of risk, such as physical risk (will the new product harm me or my family?), functional risk (will it perform properly?) economic risk (is it too expensive?), social risk (what will others think of me if I buy it?) and psychological risk (am I good enough to manage it? By the way, since customers know that product is risky, many of them do not purchase it. Firms who are trying to create a new product are somehow obliged to know all the risks that a customer may confront by the new product, and they must minimize those risks as best as they can.

Conclusion:

Kohli & Jaworski (1990)¹ identified *Market Orientation* as “the organization-wide generation of market intelligence pertaining to current and future customer needs dissemination of the intelligence across departments, and organization-wide responsiveness to it” (Kohli & Jaworski 1990) ; as an organizational activity and a set of behaviours; market orientation is identified as a useful tool to get the loyalty of customers through getting the satisfaction of those customers by using several Marketing primary ways to know the customers’ desires and needs, using the know-how, and skilfulness of the firms’ employees related to the innovative activity, this might help the firm getting a durable competitive advantage that will for sure assure the firm’s durability if known how to use the Marketing department know-how to serve the other departments, and especially that we have seen how interdepartmental integration is used in several companies all around the world, even a multinational or a micro one person enterprise. Mainly because interdepartmental integration is the engine by which the cooperation of the different departments and parts of the firm may create a strong synergy through which the common goals of those departments can be achieved. Anyway, there may exist several kinds of barriers to Innovation both within and outside the firm, we emphasized in this chapter on marketing barriers to Innovation which are classified into two main categories 1) Market barriers and 2) barriers to build a customer base. Any firm that are trying to succeed or even to survive within the market must then know which are the main obstacles that are facing its innovativeness and success like that it will be easier to face them in ways that enhance and smooth the progress of the innovative success of the firms themselves as well as the whole economy.

¹ Kohli, A. and Jaworski, B. (1990), Op Cited., P 66.

CHAPTER 3: THE EMPIRICAL STUDY

Introduction

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Conclusion

Introduction:

Over the past five decades; Growth in the stock of knowledge has been the most important factor behind the dramatic rise in living standards in the United States and other countries, Obviously, The entire system of Research and development (R&D)-or as it is sometimes called, the **National Innovation System** (NIS) concept which represents a widely useful concept in recent Innovation research and has got a growing recognition by policymakers in most developed countries; and especially that it helps raising and achieving the innovative process within the country by distributing information and technology among people and organizations. Moreover organization of Innovation plays a significant role in market-based economies as well as in their institutional set-ups; thereby the concept of NIS is employed as a theoretical framework, mainly because this concept allows for a rational holistic analysis of modern innovative activities.

We also, analyse the factors that drive Innovativeness in a sample of 56 Algerian industries, through making a questionnaire and launching a field study, this study aimed to identify the main characteristics of innovative firms and why they are or they are not successful in their innovative activities, in this Chapter, we propose two different models of Innovation, and how innovative activities can be affected by some focal characteristics and factors including the firm size, the firm's cooperation with other organizations and the skilled employees. We also take RD as a qualitative dichotomous variable which measures whether the firm has already undertaken R&D activities or no, the variable RD takes the value 1 if the firm has R&D activities and 0 otherwise. And this Model has as objective to see whether the R&D activities in Algerian Firms have the same importance as in foreign countries or no, but obviously, most of Algerian firms do not have R&D activities and in case they do some activities which have the same characteristics either they do not call them R&D or they include these activities to other departments and functions inside the firm, such as the production activity, Quality, or even Marketing. We notice here that the impact of the Innovation obstacles is taken in consideration in each of the two models

The first Model takes in evidence the Marketing activity and its integration to other functions and activities within the same firm, in both our first and second chapter, we have seen that cooperation and marketing integration have a positive impact on the firm innovativeness as well as the Innovation performance of firms, so we aimed to measure the integration levels of marketing functions to other functions within the firm (we call them functions, for the reason

that several Algerian firms do not have marketing departments but they do some basic marketing activities, while some of them have already made some ad for their products and/or services even if they do not have such a department which organize activities like those) , and the firm's cooperation with other organizations, and institutions including universities, research labs, firms and so on...

We try also to use this model in order to estimate the impact of each variable on the probability of Innovation in Algerian Firms; taking in mind the impacts of Marketing intensity (MKGI) and Marketing integration (MAR).

In the second model, we try to check the impact of all the variables taken in "model 1" out; while in this time, we try to link between the marketing activities integration and the firm's cooperation mainly because there exist empirical evidences that both internal integration, and external cooperation have a positive impact on each other and that they are correlated to each other in so many ways.

The sample then will be divided into two parts 1) innovative firms; and 2) non-innovative firms. The findings will be described and discussed later in this chapter as well as the two Models.

I. National Innovation systems –an International Comparison

In the first part of this chapter we are going to adopt the work of **Maliki et al** (2009)¹ on the national Innovation systems' international comparison including several countries such as Algeria, Tunisia and Morocco, and we will show the differences in the NIS, which attempts to add fresh insights into the organization of national Innovation systems, and by the way, we will rely on some recent analysis and researches that had been done about the US national Innovation system as one of the highly developed systems in the entire world, and we will try to compare it with those of less developed countries; otherwise we will examine the origins and viewpoint for the characteristics of the U.S. NIS which has historically distinguished its structure from those of other developed countries. This paper also explores the role of international and national institutions and governments in the mission of reinforcement of national Innovation systems through innovative policies at national and international levels.

Because of human resources development, the flow of foreign direct investment (FDI) and the rapid economic growth in several countries all around the world such as the EU, the US, Japan, China, developments in the field of science and technology (S&T) have put those countries and regions in the spotlight of the world economy. For example the fast rise in China's and Japan's expenditure on research and development (R&D) and their large stock of skilled human resources for S&T, simultaneously with the increase in R&D-intensive FDI, are strengthening those economies. Gross domestic expenditure on R&D drove so many countries to be the most developed countries worldwide, but still there so many countries and region such as Algeria and many other African and East Asian countries, which still don't rely on GERD in order to develop their economic performance, and to improve their human resources skilfulness. However; a methodical examination of R&D activities in several countries with the help of existing quantitative information is crucial for understanding the developments in those countries. Moreover, a good understanding of the National Innovation system can help policy makers developing concepts for enhancing innovative performance within a knowledge-based economy, and that would help improving the competitiveness of local firms. Anyway, NIS

¹ Maliki S.B.E, A. Smahi and A. Metaiche (2009) ; « Innovation in less-developed countries ; the case of Algeria » ; Revue Européenne du Droit Social n°3 2009, Romania.

performance depends on the fluidity and flexibility of knowledge flows among firms, universities, Nongovernmental organizations and research institutions.

I.1. Conceptual background: A brief overview on the National Innovation System (NIS) concept:

After its introduction in the late 1980s by several economists and analysts such as **Lundvall** (1992)¹, **Freeman** (1987², 1995³) and **Nelson** (1988)⁴, the concept of national Innovation systems (NIS) has been further elaborated and underpinned in the early 1990s. It can be regarded as a well-known concept within modern Innovation research. Above all, the concept focuses on the analysis of national structures of innovative activities, their institutional determinants and economic effects.

Actually; there exist many definitions of National Innovation Systems from which we can cite the following ones, such as freeman's definition of NIS: "*the network of institutions in the public and private sectors whose activities and interactions initiate, import, modify and diffuse new technologies.*" (Freeman, 1987)⁵; **Lundvall** (1992)⁶ declared that NIS is "the elements and relationships which interact in the production, diffusion and use of new, and economically useful, knowledge ... and are either located within or rooted inside the borders of a nation state.", later; **Nelson** (1993)⁷ affirmed that it is "*a set of institutions whose interactions determine the innovative performance ... of national firms.*" **Patel and Pavitt** (1994)⁸ added "*it is the national institutions, their incentive structures and their competencies, that determine the level and direction of technological learning (or the volume and composition of change generating activities) in a country.*" "*..That set of distinct institutions which jointly and individually contribute to the development and diffusion of new technologies and which provides the framework within which governments form and implement policies to influence the Innovation process. As such it is a system of interconnected institutions to create, store and transfer the knowledge, skills and artefacts which define new technologies.*" declared **Metcalf** (1995)⁹.

The NIS concept stresses that the key to the innovative process are the flows of information and technology between institutions enterprises and people. Innovation and technology (I&T) improvement are the result of a multipart set of interactions among actors in the NIS, which

¹ Lundvall, B-A. (1992). National Innovation Systems: Towards a Theory of Innovation and Interactive Learning, Pinter, London.

² Freeman, C. (1987), Technology and Economic Performance: Lessons from Japan, Pinter, London.

³ Freeman, C. (1995), "The National System of Innovation in historical perspective, Cambridge Journal of Economic. UK.

⁴ Nelson, R. (1993) National Innovation systems: a comparative analysis. New York: Oxford University Press.

⁵ Freeman, C. (1987) Ibid.

⁶ Lundvall B-A. (1992). Ibid.

⁷ Nelson, R. (1993) National Innovation systems: a comparative analysis. New York: Oxford University Press.

⁸ PATEL, P. and K. PAVITT (1994), "The Nature and Economic Importance of National Innovation Systems", STI Review, No. 14, OECD, Paris.

⁹ METCALFE, S. (1995), "The Economic Foundations of Technology Policy: Equilibrium and Evolutionary Perspectives", cited in P. Stoneman, Handbook of the Economics of Innovation and Technological Change, Blackwell Publishers, Oxford (UK)/Cambridge (US).

contains people enterprises, universities and research institutes. Innovative performance and general competitiveness can be achieved if the actors of the national Innovation systems understand what the best tools, and what the significant roles of the national Innovation system are, and by the way the well understanding of national Innovation systems can help identifying leverage faces for enhancing economic performance. Several advanced economies have relied on Policies which seek to improve networking among the actors and institutions within the system and to enhance the innovative ability of firms.

Besides, the main focus of industrial policy in most member states of the EU as well as in the Organization for Economic Cooperation and Development (OECD)¹ was on supporting education, research, and business in order to foster national and regional competitiveness. These measures designed to have an impact on all industries. They were very much stimulated by progress in the industrial Innovation and new growth theory field that tried to explain differences over time in the rates of development of economic regions and countries and to the extent to which these may be attributed to specific characteristics of National Innovation Systems (NIS).

However; from a neo-Schumpeterian viewpoint, differences across countries' economic performance are explained by the complexity of connections, coordination and interactions among public and private organizations that make their NIS up. In this context, one can say that the lack of coordination between the major objectives of public and private sectors and those of the other national institutions involved in industrial and technological policies can make vulnerable the national economic performance. **Richard R. Nelson** (1993)² says that *"To understand national Innovation systems, it is essential to understand how technical advance occurs in the modern world, and the key processes and institutions involved."*, **Nathan Rosenberg** declared that *"Today, R&D facilities, staffed by university trained scientists and engineers attached to business firms, universities or government agencies, are the principal vehicles through which technological advance proceeds in fields such as....."*, one can say that almost all of the advanced economies have developed guidelines, policies and institutions that made economic growth and foreign investment more possible through human resource investments made before their growth spurts; people in those countries have had very great benefits, with more jobs, higher incomes, higher standards of living and better social conditions.

In a review to the slight vision by which the International Monetary Fund (IMF) and the World Bank (WB) evaluate the role of institutions for development, **Johnson, & al.** (2003, page 10)

¹ Since 14 December 1960, thirty countries originally signed the Convention on the Organization for Economic Co-operation and Development (OECD). The Member countries of the Organization can be consulted at the website of the organization.

² Nelson, R. (1993). Ibid.

argue that the key issue is that *“the impact on learning and Innovation of, for example, labor market institutions, financial institutions, economic policy regimes and a host of norms supporting a learning culture are not analyzed”*. Nevertheless, *“these links are hardly found either in theoretical or in empirical studies. In general the Innovation systems concept has produced an impressively rapidly growing stock of research with approximately 1000 publications ”*(Carlson ,2003).¹ Yet, the literature has centered the evaluation and assessment of NISs on four types of knowledge or information flows which are as follows;

- 1) *Interactions among enterprises,*
- 2) *Interactions among enterprises, universities and public research institutes;*
- 3) *Diffusion of knowledge and technology to enterprises, and;*
- 4) *Personnel mobility, focusing on the movement of technical personnel within and between the public and private sectors. Several researches have been done in this field show that these four types of knowledge and information diffusion are the key drivers of the development of a good performing national Innovation system.*

The concept of national Innovation systems rests on the premise that Innovation and technical progress are the result of the good understanding of the linkages among the actors of the economy, so the innovative performance of a nation depends to a large degree on how these actors interact and coordinate with each other as key players of a collective system of knowledge and technology creation.

Usually, organizations are the main actors in the NIS in most developed countries and especially that the increase of the learning capacity is particularly important for these countries as they could obtain new technology from other ones, but they have to become skilled and innovate in order to use new technologies efficiently. Generally it is accepted that Innovation is surrounded by the major roads for nations and firms to follow a sustainable development path and stay competitive. However, the role of knowledge in creating competitive advantages has progressively increased. The ability to generate new knowledge requires the knowledge-based Innovation system. By the way one of the most important distinguishing qualities of the U.S Innovation system is its massive scale, because of three major sectors which are industry, government, and universities, and even if the role played by these three sectors have changed significantly during the past 60 years, they are still the most important sectors which bring the successfulness and the booming for the U.S INS. Anyway, compared to other countries, the small start-up firms have played a significant role in the development and the contribution of key technologies within the U.S in the last 5 decades just like computer hardware and software,

¹ Carlson, B. (2003) “Internationalization of Innovation systems: a survey of the literature”. SPRU, Paper for the conference in honor of Keith Pavitt: What Do We Know about Innovation? Brighton, U.K.

microelectronics. The notion of 'sectoral systems of Innovations' was launched in 1997 (Breschi and Malerba, 1997)¹, and the regional Innovation systems concept was developed in order to highlight the consequences of regions in the process of innovative activities, (Cooke 1996)².

Two public policies in particular added to contrasts between the structures of the US NIS and those of other countries. The antitrust status of the US and the important role of military R&D within the US INS have had complex effects on the structure and performance of the US NIS. Innovation systems work through the opening of knowledge into the economy, which necessitates dynamic learning by all actors of the Innovation system.

Lundvall noted the role of learning in binding together production and Innovation in the NIS and as the promoter of dynamism in a system. According to Lundvall's analysis the NISs are the learning systems of national economies (Lundvall 2002)³. Moreover; Analysis of technology performance and policies has traditionally focused on inputs (such as expenditures on research and development and the number of research personnel) and outputs (such as patents), the measurement of which is standardized across OECD countries (OECD, 1996a)⁴.

There exist so many indicators of the basic research capabilities of the US Innovation system such as the Nobel Prizes won for research achieved within the US research centres, put forward that the research performance of the US system is well-built; however, the US Innovation system has not succeeded in maintaining pre-1973 rates of growths in real earnings, nor has it made possible the US productivity growth to match the rates of other industrial countries. Besides the recent technological performance of U.S firms appears to be quite feeble in several issues, and several detailed comparisons of the performance of the US and Japanese automobile industries suggest that US companies have been held back by much longer development cycles, slow and less-effective commercialization for new products.

As the developing countries move up the development ladder and carry out industrially and technologically more complex activities they need to improve their organizational capabilities as well. Otherwise the need for soft skills (organizational, managerial, and so on) could be among the most serious obstacles of development in those economies.

The study of national Innovation systems offers new concepts for government technology policies. The concept of national Innovation systems expresses the interest of policy makers to possible total failures which may obstruct the innovative performance of the country. Furthermore, the lack of interaction among the actors in the system, differences between basic

¹ Breschi, S. and F. Malerba "Sectoral Innovation systems: technological regimes, Schumpeterian dynamics, and spatial boundaries", 1997.

² Cooke, P. (1996) "Regional Innovation systems: an evolutionary concept". In Regional Innovation systems. H. Baraczyk, P. Cooke, and R. Heidenreich, eds. London: London University Press.

³ Lundvall, B.-A., B. Johnson, E.-S. Andersen, and B. Dalum (2002) "National systems of production, Innovation and competence building". Research Policy 31, 213–23.

⁴ OECD (1996), Science, Technology and Industry Outlook, Paris.

research in the public sector and more applied research in the private sector may all contribute to poor innovative performance in a country. However, institutional change in the US, Japan, and the EU is occurring simultaneously with growing international trade in high-tech products and increasing international interdependence of international Innovation systems. (OECD)¹

I.2. National Innovation systems and economic performance:

Since the first appearance of National Innovation Systems (NIS) concept it has internationally started changing the goals and directions of Innovation policies, this concept highlights the role of the co-operative interaction between individual innovative firms and other innovative organizations. Hence, this concept would be promoted especially when businesses, financial system, and research and academic bodies are included within a general system. Research group headed by Nelson (1993)² compared the NISs of 15 countries, discovered that the dissimilarities between them reproduced different institutional arrangements, including: systems of university research and training and industrial R&D; financial institutions; management skills; public infrastructure; and national monetary, fiscal and trade policies. By the late 1990s, OECD had initiated broad comparative countrywide study of national Innovation systems (OECD 1997³, 2002⁴), which produced support to the ideas of **Charles Edquist** (2001) and **Jack Metcalfe** (1995)⁵, that national Innovation system is a comparative concept – there could not be an ideal NIS, which fits different nations with their specific socioeconomic, political and cultural background (Urmas Varblane & all, 2007)⁶.

However; a recognized model of a NIS does not exist and it is so hard for a particular NIS to be useful to another country by the same degree of performance. By the way, through case studies, **Nelson and Rosenberg** have emphasized that "*we have been impressed by the diversity of 'national systems' that seem to be compatible with relatively strong, and weak, economic performance in particular contexts...partly is may be because the performance of the Innovation system is a larger factor behind economic performance in some contexts than in others.*"(Nelson and Rosenberg); moreover they (Nelson and Rosenberg) have declared that"*... since considerable differences exist when even comparing countries with similar economic conditions. The differences are caused by historical and cultural differences including the process of industrialisation, and have a role in shaping the legal systems and policies of a particular country.*"

¹ OECD, National Innovation systems, OECD Publication, Paris, unknown year of publication.

² Nelson, R. (1993) Ibid.

³ OECD, (1997b), National Innovation Systems, OECD Publications, Paris.

⁴ OECD (2002) Dynamising National Innovation Systems. OECD Publications, Paris.

⁵ METCALFE, S. (1995), Ibid.

⁶ Urmas Varblane, David Dyker, Dorel Tamm (2007), how to improve the national Innovation systems of catching-up economies?, the EU 6th framework project CIT5-CT-028519, Estonia.

As **Schumpeter** (1939) said « *Innovation is possible without anything we should identify as invention and invention does not necessarily induce Innovation, but produces of itself no economically relevant effect at all* », and by the way, entrepreneurs are ones of key creator of Innovation within the economy, whatever it is their degree of activities or performance, and even if they don't have such huge capacities or tools to innovate they can do it without anything.

The Arab World has been trying to improve its S&T system over the last few years. In the educational component of this system there are more than 175 Universities (1996) and the level of increase in number is quite high especially in the new millennium. The Arab World spends more than 7 billion dollars yearly on higher education; and by the way, there are more than 50 thousand Professors in S&T and an accumulated total of about 10 million University graduates of which there are more than 700000 engineers.

Many argue that education system is a main barrier to the development in the Arab world because it produces quantities of university graduates with lower set of skills. Statistics indicate that Arab countries have invested less in human capital, have less engineers and technicians per capita, and are less equipped for today's labour market.

Many researchers in this domain have brought to light many terms of exploring the usefulness and the limits of NIS in various countries all around the world; for example, they have discussed the different structures of R&D, and the dissimilarities of the role played by the universities, the companies, and institutions in the U.S, France, Germany, China, The U.K and do on.

I.3. The Applicability of the NIS concept in developing countries:

As we all probably know, the Innovation system concept was employed using experiences of high income countries, with developed infrastructures and institutions, well built knowledge base, and well-functioning /economic systems, The situation of developing countries is rather different than those of developed economies. They have much lower income levels, a smaller amount of the role played by institutions and infrastructures on R&D aspects, and less accumulated knowledge. In addition, the foreign direct investments in the developing countries are playing much more important role than in the rich industrialised countries applying the national Innovation system concept, but it's not the case for the less developed countries. Therefore the relationships between globalisation and national/local systems need to be further researched.

Gregersen & al. 2001 and **Johnson & al.**¹ (2003) proposed that when applied to the developing countries, the focus ought to be shifted in the direction of system construction and system promotion. However, the majority of applications of the Innovation system framework to development attempt to transpose a well-functioning Innovation system model based on developed countries into developing countries (see discussion in Arocena and Sutz, 2003)². Anyway, in the NIS literature, there exists fairly little analysis of organizations acting as obstacles to Innovations, which is the case in less developed countries, Therefore instead of copying the adaptation of the Innovation system, a different concept is needed in those countries. In order to meet the challenge of adaptation the Innovation system for development processes, the interpretative alignment framework was suggested by Kim and von **Tunzelmann** (1998)³ as the 'alignment' of different levels of interaction at different territorial scales of governance, i.e., sub-national, national, and supra-national

After the systemic change in the early 1990s the role of linear Innovation model still remained the prevailing Innovation model for the policy-makers in transition economies. It has taken the form of the mystification of the role R&D, which reflects the misunderstanding about the mechanistic relationship between increased R&D spending and higher per capita GDP. R&D and Innovation are often used as synonyms among the policy-makers in catching-up economies. The higher the expenditures on R&D, the higher is the innovativeness of society expected to be. Unfortunately this fetishism of R&D has been cultivated also in many recommendations given to the transition countries from various consultants and even in the EU recommendations. Indirectly this attitude is also supported by various rankings, scoreboards and other comparative tools, where due to the lack of other appropriate measurement variables the R&D expenditures and similar indicators are playing the central role. (See **Urmans Verblane and al.**, 2007)⁴.

By the way, according to **Urmans Verblane & al.** there exist several problems in the building up of NIS, as the reflection of path-dependency, such as the following ones;

- 1) *Underestimation of the role of public sector in the national Innovation system*
- 2) *Dominating role of the linear Innovation model and neglecting demand*
- 3) *Confrontation between high- and low-tech industries*
- 4) *Overvaluation of the role of foreign direct investments*

¹ Johnson B, Edquist C and Lundvall B (2003). Economic development and the National System of Innovation concept".

² Arocena, R. and J. Sutz (2003) "Knowledge, Innovation and learning: systems and policies in the north and in the south". In Systems of Innovation and development, 291–310. J. E. Cassiolato & al., eds. Cheltenham Edward Elgar Publishing.

³ Kim, S.-R. and N. v. Tunzelmann (1998) "Aligning internal and external networks: Taiwan's specialization in IT". SPRU Electronic Working Papers Series 17. Brighton: SPRU.

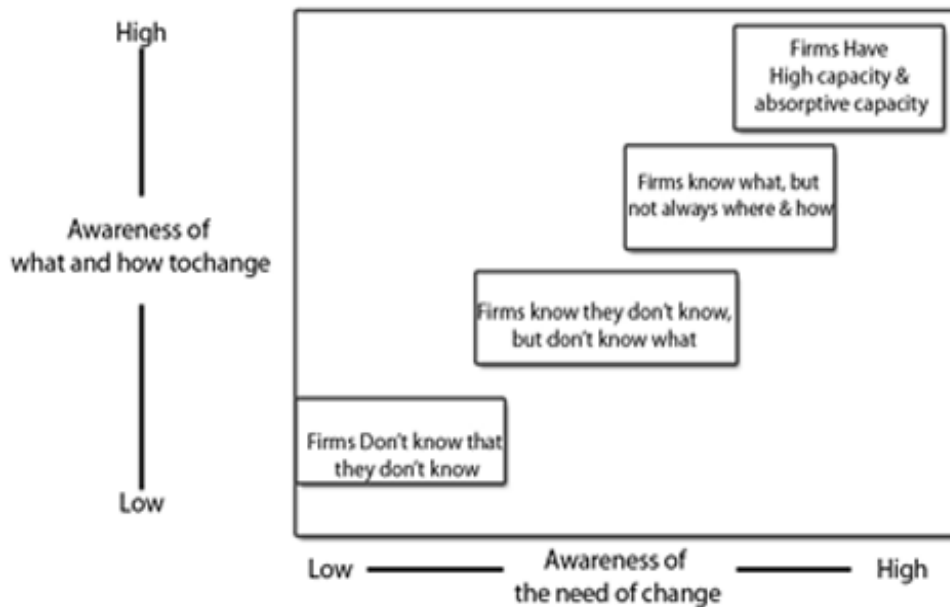
⁴ **Urmans Verblane, David Dyker, Dorel Tamm** (2007), how to improve the national Innovation systems of catching-up economies?, the EU 6th framework project CIT5-CT-028519, Estonia.

5) *Lack of social capital and network failures*

6) *Weak Innovation diffusion system and low motivation to learn*

Nevertheless, in 2002 **the World Bank** analysed the technological ability of firms to innovate and their internal willingness to change in Korea. Firms in the following figure are distributed into four groups based on the grade to which they are conscious of the need to change and the degree to which management is aware of what should be changed and how to go about changing it. At the lowest level are firms without any capacity for technological change and which do not feel any need for change. That is exactly the case of many firms in a country like Algeria.

Figure 16: Classification of firms by their technological capability and motivation to change.



Source: the World Bank, 2002.

The task of Innovation system in this case should be able to move firms up the ladder described in Figure 16. It requires activities in two dimensions. Firstly, to push firms to develop their capacity to absorb technologies from abroad and innovate by providing access to different sources of technologies. Secondly, to improve the internal motivation of firms to change, this requires providing data for firms about their relative position comparing with the best practises in the world.

Anyway, in the recently released “National Guidelines for the Medium- and Long-term Plan for Science and Technology Development (2006-20) of China”, S&T is considered as the key driving force for sustainable economic growth and for transforming China into an Innovation-oriented nation through the construction of a NIS. Several major R&D players all around the world, such

as the United States, Japan, China, and the UK still aim to raise the ratio of R&D expenditures to GDP in the next few years, for instance the Chinese government seeks to raise its Gross Domestic Expenditure on R&D (GERD) to 2% by 2010 which is an extremely ambitious objective, and by the way, it needs to increase its R&D expenditures by at least 10-15% annually; but however, the Chinese R&D strength, in particular in key high-tech production, is still insulated. R&D intensity in Africa fell from an initial 1.3% to 0.8% of GDP spent in R&D. while South Africa accounted for more than 60% of the estimated total expenditure in Africa in 2005, almost all of the African and less developed countries are still behind schedule in GERD terms and measures; and by the way, increasing R&D intensity to a level that is close to that of developed countries will be a giant challenge for these countries. The Table 17 confirms this sight, and furthermore it evaluates GERD for a number of African countries.

Figure 17: GERD in some African countries (2005 or latest data available):

Country	Year	GERD ('000) – Local currency	GERD - PPP\$ ('000)	GERD – as % of GDP	GERD per inhabitant (PPP\$)
Algeria	2005*	4,994,000	133,360	0.07%	4.1
Botswana	2005	205,567	84,916	0.39%	46.3
Burkina Faso	2005*	4,914,954	24,547	0.17%	1.8
D.R. of Congo	2005*	16,116,424	75,217	0.48%	1.3
Egypt	2000*	654,600	474,513	0.19%	7.1
Ethiopia	2005*	192,227	85,282	0.20%	1.1
Lesotho	2004*	5,400	1,552	0.06%	0.8
Madagascar	2005*	15,942,004	24,542	0.16%	1.3
Mauritius	2005*	690,030	47,014	0.38%	37.9
Morocco	2003	3,144,000	618,758	0.66%	20.7
Mozambique	2002	501,580,800	52,267	0.50%	2.7
Senegal	2005*	4,090,000	16,252	0.09%	1.4
Seychelles	2005*	15,271	4,551	0.38%	54.9
South Africa	2005	14,149,239	3,654,269	0.92%	76.2
Sudan	2005	19,284,000	179,085	0.28%	4.9
Tunisia	2005	384,000	660,607	1.03%	65.4
Uganda	2006	33,082,120	51,365	0.19%	1.7
Zambia	2005*	9,272,025	3,840	0.03%	0.3

* partial.

Source: UIS S&T Database, 2008¹

¹ UNESCO Institute for Statistics (UIS) International data collection and uses of international data: Overview of data for Africa, Seminar – Workshop on Science, Technology and Innovation Indicators Gaborone, Botswana, 22-25 Sept 2008.

The table above shows the progress made in few countries such as South Africa, Morocco, Tunisia, Botswana, D R Congo, Mauritius, Mozambique, and Seychelles. We can see also that the Algerian GERD are much less than those of related countries such as Tunisia and morocco, even if the data concerning morocco were collected on 2003, parenthetically 0.07% of GERD– as a percentage of GDP is the lowest on in all the selected countries except Zambia and Lesotho and by the way, the estimated average of the GERD expenditure in the African countries must be at least 0.4 - 0.5 per cent. Furthermore the medium of \$4.1 US of GERD per inhabitant must also be improved in the next few years. The Arab countries constitute around 3.5% of world GDP and more than 4% of world population, but Arab countries consume around only 0.4% of the Gross Domestic Expenditure on R&D (GERD) and then The Arab world is not investing enough of its economic resources in technology, and was ranked last – even lower than African countries. By the way, a most recent statistics reveal that 89-97% of R&D expenditure in the Arab world is funded by the public sector. By contrast, more than 50% of R&D expenditure in developed economies is funded by the private sector. (Abdallah Alnajjar, 2002)¹. Since 2000, R&D expenditure relative to GDP (R&D intensity) has increased in Japan, and it has decreased slightly in the United States.

In 2004 and 2005, Sweden, Finland, and Japan were the only three OECD countries in which the R&D-to-GDP ratio exceeded 3%, well above the OECD average of 2.3%. Since the mid-1990s, R&D expenditure (in real terms) has been growing the fastest in Iceland and Turkey, both with average annual growth rates above 10%.

R&D expenditure for China has been growing even faster than GDP, resulting in a rapidly increasing R&D intensity, growing from 0.9% in 2000 to 1.4% in 2006.²

Statistics of university graduates in the labour force is roughly 12 to 15 millions in an adult population (about 150 million). From which about 30 to 40 percent of these are in applied & basic sciences.

This is a significant proportion when compared with world's leader, US, whose equivalent proportion is 20%. Potential researchers in the Arab World were about 60,000 in year 2001. Research output per faculty varieties from 0.5 papers annually to less than one publication per 10 "potential researcher". An analytical study indicated that, on average, only 5 percent of university teachers' load in the Arab is utilized for research related activities while this percentage tops to 40% in advanced countries.

¹ Alnajjar A., Networking the Arab Scientific Community Can Bring Change to the Arab Countries; Toward Harvesting Outcome of Arab Education System, Arab Science & Technology Foundation (ASTF), 2002.

² OECD (2007), Main Science and Technology Indicators, OECD, Paris.

The majority of foreign-invested companies in advanced countries, even in medium- and high-tech industries, engage in manufacturing activities and perform little R&D in those countries. In the last decade, many governments worldwide just like the Chinese government have adopted policies to improve the quality of the R&D personnel and at the same time to reduce the number of government research institutes and employees. The higher education sector in advanced countries is one of the key pillars of the NIS and especially that it plays a significant role in Science and Technology diffusion, moreover as a supplier of S&T human resources, and particularly while the linkage between academia and industry is getting increasingly strong.

Algeria is facing quite a lot of structural challenges concerning the national Innovation system; here we count for example the Knowledge and technology diffusion through industrialization of S&T products. In fact the knowledge and technology barriers are associated with poor Innovation abilities within the country and an inefficient market mechanism with a lesser amount of moral rights properties' and brands' protection. There exists also the gap between national and foreign actors which makes the Innovation processes much difficult.

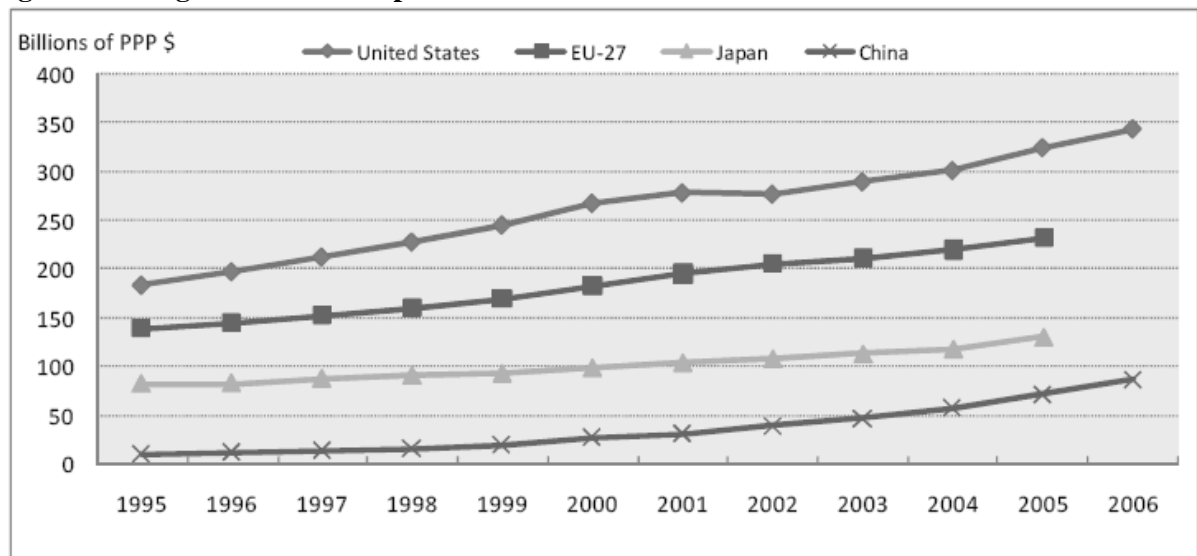
Moreover; there are also the gaps between regions which are getting wider, with large regional inequalities in R&D activities as well. This could be a serious challenge, which is evident in other areas such as human resources, high-technology industries and the openness of regional economies. In the last decade, some advanced countries have launched various strategies designed at energising less developed regions and accelerating union through a combination of regional, financial and S&T policies, and so the African governments including the Algerian one should plan to do the same and especially that these strategies have brought a really massive profit for those countries. Algeria needs also to reward through the international standards of S&T; actually China for instance has made so many reforms and institutional changes, in the 1990s, these reforms can be cited as follows:

- Restructuring of government research institutes through downsizing, and organizational reforms and re-orientation of governmental support towards basic and applied research.
- Expansion of the higher education sector by increasing the number of new entrants at both the undergraduate- and the graduate level, and stronger, but more concentrated financial support to the key research-intensive universities.
- Strengthening the Innovation capacity of enterprises.
- Increasing openness of the market by introducing advanced technology and by generating spill-over effects in various forms at the intra- and inter-sector level.
- Creation of a technology market to facilitate the interaction among key performers.

- Encouraging science-industry linkage among key performers.

While the GERD is still the lowest in the less-developed countries and especially the African ones -including Algeria-, the top developed countries and regions in R&D and Innovation indicators such as the US, Japan, China and the EU have increased rapidly their GERD between 1995 and 2006 (the OECD, 2007)¹. a huge part of R&D expenditures in those countries is contributed by small enterprises whereas almost all of the Algerian R&D expenditure is supplied by the government, the figure 17 shows the gross domestic expenditure on R&D in the US, the EU, Japan and China.

Figure 18: the gross domestic expenditure on R&D in some countries.



Source: MSTI 2007/2 (OECD, 2007b)².

The figure above illustrates the growth of R&D expenditures in the period 1995-2006 (or last data available) in the selected countries, the growth of the GERD has been really impressive and especially for China, with an annual average of more than 18 %. The annual average growth rates of gross domestic expenditure on R&D in the selected countries, by the way, the Algerian GERD has increased by less than 2 percent in the same period which is a really little average comparing with those of other countries such as the chosen ones. The key actors of R&D activities in selected countries are government, research institutes, the higher education sector and the business sector, while and as we said before, the Algerian business sector does not have neither that good performance nor enormous capacities as the Chinese' one do, We'd cite in the next table a number of important general characteristics and the relative importance of those performers (**Business sector, Higher education and Government research institutes**).

¹ OECD, (1997b), National Innovation Systems, OECD Publications, Paris.

² OECD (1997b), Ibid.

Table 12: General characteristics of the three key performers in China

	Government research institutes	Higher education	Business sector
R&D funding source	Government funding as main source.	Diversified: mainly government & business sector. Increased foreign funding.	Rapid increase in self-funding
R&D expenditure	Annual average growth rate of 9.7% during 2000-2006 (based on constant prices)..	Annual average growth level of 20.0% during 2000-2006 (based on constant prices).	Annual average growth level of 22.0% during 2000-2006 (based on constant prices).
R&D structure	Applied research. Basic research.	Basic research too low. Applied research dominates.	Mainly experimental development.
Challenges ahead	Increase basic research, Commercialisation of research results.	Research capacity and its impact in general should be strengthened. Increase in basic research. Decrease the share of experimental development.	Indigenous Innovation capacity. International competitiveness. Participation of S&T-based SMEs.
Participation in globalisation	Low participation.	Increasing participation in both education and research.	High participation facing both new opportunities and new challenges.
Role in the NIS	Decreased shares of S&T personnel in total. Decreased share of S&T and R&D expenditure.	S&T human resources supply. Applied & basic research. Key laboratories. Important role in science industry linkage.	Emerging driving force and core of the NIS.

Source: Martin Schaaper. (2009), "Measuring China's Innovation System: National Specificities and International Comparisons", OECD Science, Technology and Industry Working Papers, 2009/1, OECD publishing.¹

Telephone lines played and still playing a significant role on the economic development and technology and information sharing worldwide, however; the developed countries are observing a decrease in Fixed lines number, which has been introduced by the reason that people are increasingly replacing their fixed phone by (a) mobile phone(s). Studies have shown that especially in the EU, where there are now more mobile phone subscribers than people. In Algeria as well, the mobile phone has taken a greater average than fixed lines, by 27.563 million subscribers in 2007, which means 90.47 per 100 inhabitants (the world factbook of the Central Intelligence Agency, 2009).

Gross domestic expenditure on R&D has a great impact on the R&D development within the country/ region, thereby several countries all around the world aim to improve their spending on R&D according to their GDP, in ways that benefit local and regional economic development, anyway, the next chart illustrates worldwide Gross Domestic Expenditure on R&D as a percentage of GDP. We can see that Algeria is one of those countries with GERD less than 0.25

¹ OECD, (2009), "National Innovation systems", OECD Publication, Paris.

% such as Egypt, Madagascar, and Chile, while similar countries just like Morocco and Tunisia spend more than 0.5 % of their GDP on R&D and this what we have already seen above, we can see from the chart that Algeria is still spending very little amounts on R&D in the world, and that would be an obstacle for the economic and social development of the country, thereby the Algerian government should look forward to improve its expenditure on R&D in order to improve its National Innovation System, and by the way, that wouldn't be achieved if the national institutional and business players would rely on the limited role of the government to improve the NIS status, moreover, we can notice (from the last Chart - Researchers per million inhabitants) that the number of researchers in Algeria is still limited (less than 300 researchers per million inhabitants) comparing with the real huge capacities that the country has, and by the way, it's (Algeria) still late in this indicator, in that way local R&D players should think in such good ways to improve the number of researchers within the country, and that what is happening since 2000, because the education and the number of graduate students are getting better.

Anyway, In order to integrate rapidly into the global economy, the public and private sectors in Algeria have to increase their degree of competitiveness and this cannot be achieved an efficient National Innovation System; especially that several advanced countries and regions in S&T terms have already built their economic systems on a R&D and Innovation issues with huge expenditures on R&D; which is not the case in Algeria and most of all Arab and African countries. In 2005, there were about 7.3 researchers per thousand employees in the OECD area, compared with 5.9 per thousand in 1995. The number of researchers has steadily increased over the last two decades. Among the major OECD regions, Japan has the highest number of researchers relative to total employment, followed by the United States and the European Union. Finland, Iceland, Japan, and New Zealand have the highest number of research workers per thousand persons employed. Rates are also high in Denmark, Sweden, Norway and the United States. Among the OECD countries, research workers per thousand employees are low in Mexico and Turkey.

Among the major non-member countries, growth has been steady in China, although, at 1.8 in 2007, it still remains well below the OECD average. The level for the Russian Federation has been falling since 1994, but was still 6.7 researchers per thousand employed in 2007.¹ Moreover, they have to increase the degrees on account of the progress achieved in S&T and R&D sectors. International comparability of Algerian S&T indicators shows to a great degree why Algerian

¹ OECD (2008), Main Science and Technology Indicators, OECD, Paris.

Firms are much less competitive than those of other countries who has similar characteristics such as Morocco and Tunisia.

Anyway, policy makers should rely on their national resources and above all the Human Resources as a key factor to achieve their future goals and programs, in that way they should give their most intention in the future, otherwise, the other wealth will be useless to bring development to the country.

II. Empirical study: Methodology and discussion:

As a second part of our study, we made a questionnaire concerning Innovation activity within Algerian Firms taking in our sample 83 industrial firms, The surveys were sent to the sample via 3 main ways such as a direct contact with those companies, but for some unknown reasons the firms were refusing in so many cases to receive neither us nor our questionnaire, even if we have been trying not to get into their confidential data by our questionnaire, and then we had somehow to change the way we were interviewing the sample through, so then we passed into the next level which was the online questionnaire conception, after making an electronic form of our questionnaire we went to the Chamber of commerce in Tlemcen city in order to ask them for help, the Chamber of commerce gave us a list of member companies in the Chamber of Commerce, so that we have been able to contact some of these companies via 3 main ways 1) electronically either via email or via the electronic form which has been installed into the web site of **the commerce chamber of Tlemcen (la Tafna)** and redirected to the author's email box, 2) via phone. 3) Directly through personal visits. More than 250 questionnaires were distributed to the local industrial firms especially those located in Tlemcen and the western region, not for a particular reason but it was only because it was the easiest way to accomplish our study mainly because the survey population was a bit hard to be identified in particularly because we tried so many times to contact firms which have already the industrial property rights and patents of their invention, through contacting the **INAPI**, but this organization did nothing to help us in our research because they were saying that it is classified and that it is a confidential thing that we were asking for, even if we asked for the names of some firms who have already either asked for or got the **INAPI** services, but each time we called they said to call another number, so that we lost more than 1 month waiting for their information, until we decided to try another way exploring the facts of Innovation in Algeria. From approximately 250 distributed surveys; 56 responses were accepted to be included as valid in our study, while 8 responses were refused either because the missing data, or for the reason that the firms which responded to these questionnaires were not included to our sample, and tow of them were removed because the

respondents were neither a high qualified employee, nor a business owner or manager of the two firms. Giving a response level of about 25.6 %, where the respondents were mainly managers, business owners, and high qualified employees of the firms taken in our study. The level of acceptance was 22.4 % of all the distributed questionnaires. The firms were mainly located in Algiers (by 24 industrial firms) and Tlemcen by 18 industrial firms) and the rest were distributed between Saida, Sidi Belabbes, Oran, and Blida.

II.1. Data Description

Our empirical study is based on the Innovation survey in which we tried to measure the innovative activities for Algerian Firms from which a sample of 250 firms were contacted either electronically via emails or via phone and even personally by the author . Those firms have been asked to respond to a questionnaire that includes, besides their principal characteristics (such as the firm's size, the business field, beginning date for the firm's activity...), several questions related to R&D and Marketing activities, (Marketing and R&D intensities, skilled employees' number, level of Innovation, Innovation obstacles, Innovation performance, cooperation with universities, labs, other firms and organizations, either inside or outside Algeria, the management of Innovation has been taken in consideration in our studies, through asking some questions, either related or unrelated to each other but they all fall in the same aim which is to evaluate the Innovation management within Algerian Firms mainly industrial firms including manufacturing, and service firms.

II.2. Econometric Specification and Estimation Techniques

As to take INNO as the dependent variable for the econometric purpose, and because this variable is a dichotomous qualitative variable we utilize the binomial logit model due to the qualitative nature of the dependent variable, and moreover for the reason that the logistic regression is useful in case the endogenous variable is dichotomous whereas the exogenous variables are either qualitative or quantitative. Consequently, the logistic regression allows us to estimate Innovation propensity of the firm as a function of its R&D expenditures, its R&D intensity, its cooperation with other firms and organizations, its in-house Marketing efforts, its size as well as moderator variables. What we check out whether Algerian firms are innovative or not, and this can be seen in the dichotomous variable named INNO and which takes the value 1 in case the firm is innovative, and the value 0 otherwise; in our case, we use a set of explanatory variables (including the firm size, the marketing intensity, Marketing integration to other functions, R&D, R&D intensity, the firm's cooperation with other organizations and

firms...) in order to build up a model where the outcome is explained. By the way, Ordinary Least Squares (OLS) is not a suitable method to use for cases like this one; mainly because in OLS, the variable that we seek to explain must have real values and can run from infinity minus ($-\infty$) to infinity plus ($+\infty$). However, the logistic regression must be used if the dependent variables are binary; thus we mustn't apply multiple regression, anyway; if the dependent variable INNO is binary (coded 1 if the firms has already undertaken process or product Innovation within the Algerian market and the value 0 otherwise) we must straight away use the logistic regression, and so, we would successfully be modelling the probability p of the event occurring. However, including such a binary dependent variable in multiple regressions causes problems as the assumptions underpinning multiple regressions are violated. First, the least squares estimation procedure does not produce the most efficient estimates of the coefficients b , and, second, the model can produce predicted probabilities negative in value (less than 0) or greater than 1 - both of which are outside the range of a probability, 0 to 1. To

$$\text{Odds} = \frac{p}{1-p} ;$$

solve the second problem we can replace the probability p by the Odds¹.

Where " p " is the probability of the event occurring (which means that the firms has already undertaken process or product Innovation within the Algerian market), and so " $1-p$ " means the probability of the event not occurring (which means that the firms has not (yet) undertaken process or product Innovation within the Algerian market)

For example, if $p=0.7$, then the Odds must be counted as follows,

$$\begin{cases} \text{Odds} = \frac{p}{1-p} \\ p=0.7 \end{cases} \Rightarrow \text{Odds} = \frac{0.7}{0.3} \Rightarrow \text{odds} = 2.333.$$

Besides; we can make it easier and much simple by taking the natural logarithms of the odds and so we would overcome most of the problems of binary variable by transforming the probability p to the odds log, because that modifies the odds scale from **0 to 1**, to **$-\infty$ to $+\infty$** (that means from $[0,1]$ to $]-\infty, +\infty[$), and then the odds scale will be centralized on 0; otherwise, odds less than 1 have negative values of log odds or log of the odds, or logit (the logit values should be included in the interval between $]-\infty, 0[$) and so odds greater than 1 would have positive values of log odds, (the log odds should be included in the interval between $]0, +\infty[$).

¹ Odds and odds ratios are frequently used to express the relationship between categorical variables; an odd is defined as the probability of an event occurring divided by the probability of the event not occurring.
Odds = $p/(1 - p)$. and odd ratios are simply the ratios of two odds,

Anyway, logistic regression is one of the most used methods to the interpretation or the analysis of the odds of any case of binary qualitative variables, especially by SPSS¹ and STATA, and chiefly because of the maximum likelihood² used in logistic regression models as an estimation procedure, which can help us overcoming the problems caused by least squares inefficiency.

For the reason that there is no mathematical solution that will produce least squares estimates of the parameters in the logistic curve as well as so many other models, the loss function used here is called maximum likelihood, which is a conditional probability (e.g., $P(Y|X)$, the probability of Y for a given X). We can pick the parameters of the model (a and b of the logistic curve) at random or by trial-and-error and then compute the likelihood of the data given those parameters. We will choose as our parameters, those that result in the greatest likelihood computed. The estimates are called maximum likelihood because the parameters are chosen to maximize the likelihood (conditional probability of the data given parameter estimates) of the sample data.

Nonetheless; Logit regression analysis is a technique which allows us to estimate the probability that an event occurs or does not occur, by predicting a binary dependent outcome from a set of independent variables, accordingly to what we have seen before we can take an example of “firm innovativeness”; where we study the probability of a firm to be innovative within the Algerian market, according to its size, R&D intensity, Marketing intensity, interdepartmental integration, Employees’ skilfulness, Barriers to Innovation, Market structure...and then the dependent variable is being innovative or not, and the independent variables are the firm size, R&D intensity, Marketing intensity, interdepartmental integration, Employees’ skilfulness, Barriers to Innovation, Market structure... we take P_i the probability of being innovative

within the Algerian market by the i^{th} firm and then $(1 - P_i)$ would be the probability of the firm not to be innovative within the Algerian market, thus $\frac{p}{1-p}$ is the odds ratio in favour

¹ We will rely on SPSS, in our empirical study.

² Maximum likelihood estimation (MLE) is a popular statistical method used for fitting a statistical model to data, and providing estimates for the model's parameters. The method of maximum likelihood corresponds to several well-known estimation methods in statistics. The sample mean is considered to be the maximum likelihood estimator of the population mean, and the sample variance is a close approximation to the maximum likelihood estimator of the population variance. Anyway, for a fixed set of data and underlying probability model, the method of maximum likelihood selects values of the model parameters that maximize the likelihood function. Maximum likelihood estimation gives a unified approach to estimation, which is well-defined in the case of the normal distribution and many other problems; however. In some complex problems, difficulties do occur: in such problems the maximum-likelihood estimators may be unsuitable or may even fail to exist. (Visit http://en.wikipedia.org/wiki/Maximum_likelihood for further information).

of being innovative, that means the ratio of the probability that a firm i is innovative, to the probability that the same firm is not innovative. The linear probability model illustrated it as:

$$p_i = \frac{\exp[-(\beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \dots + \beta_n x_n)]}{\exp[-(\beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \dots + \beta_n x_n)] + 1} \dots (2)$$

$$(2) \Rightarrow p_i \frac{1}{1 + \exp[-(\beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \dots + \beta_n x_n)]}$$

$$\Rightarrow p_i = \frac{1}{1 + \exp(-Y_i)} \dots (3)$$

$$\text{Where } Y_i = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \dots + \beta_n x_n$$

Here; Y_i ranges from $-\infty$ to $+\infty$; and p_i ranges from **0 to 1**; we can see that p_i is not linearly related to Y_i in both x_i and β_i , satisfying the two conditions required for a probability model, this means that we cannot use OLS procedures to estimate the factors.

Anyway, p_i which is as we said before; the probability of the probability of a firm to be innovative within the Algerian market, and is given by the next equation:

$$p_i = \frac{1}{1 + \exp(-Y_i)} \text{ and then the probability of not being innovative } (1 - p_i) \text{ is}$$

given by the relation that follows:

$$(1 - p_i) = 1 - \frac{1}{1 + \exp(-Y_i)} \dots (4)$$

$$(4) \Rightarrow (1 - p_i) = \frac{1 + \exp(-Y_i)}{1 + \exp(-Y_i)} - \frac{1}{1 + \exp(-Y_i)}$$

$$\Rightarrow (1 - p_i) = \frac{\exp(-Y_i)}{1 + \exp(-Y_i)}$$

$$\Rightarrow (1 - p_i) = \frac{\exp(-Y_i) / \exp(-Y_i)}{[1 + \exp(-Y_i)] / \exp(-Y_i)}$$

$$\Rightarrow (1 - p_i) = \frac{1}{1 + \exp(Y_i)} \dots (5)$$

Therefore from the equation (3) and (5) we can write

$$\frac{p_i}{(1 - p_i)} = \frac{1 + \exp(Y_i)}{1 + \exp(-Y_i)} \quad (6)$$

$\frac{p_i}{(1 - p_i)}$ is the odds ratio ; and by taking the natural logarithm of (6), we get

$$L_i = \text{Log}\left[\frac{p_i}{(1 - p_i)}\right] \Rightarrow L_i = \text{Log}\left[\frac{1 + \exp(Y_i)}{1 + \exp(-Y_i)}\right] \dots (7)$$

L is the log of the odds ratio which is not only linear in x but also in the parameters; we call L the Logit.

$$\text{Then, } \log(\text{odds}) = L_i = \text{Logit}(p) = \ln\left(\frac{p_i}{(1 - p_i)}\right).$$

II.2.1. The Logistic Curve

The logistic function is useful because it can take as an input any value from negative infinity to positive infinity, whereas the output is confined to values between 0 and 1. we take the following logistic function

$$Y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \dots + \beta_n x_n$$

Where The variable (Y) represents the exposure to some set of independent variables $x_1, x_2, x_3, x_4, \dots, x_n$, while $f(Y)$ represents the probability of a particular outcome, given that set of explanatory variables, and where;

$$f(y) = P_i = \frac{\exp(Y_i)}{\exp(Y_i) + 1} \implies p_i = \frac{1}{1 + \exp(-Y_i)}$$

The variable "Y" is a measure of the total contribution of all the independent variables used in the model and is known as the logit. The variable "Y" is usually defined as

$$y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \dots + \beta_n x_n$$

The logistic curve relates the independent variable, y , to the rolling mean of the dependent variable, $f(Y)$. where P is the probability of a 1 (the proportion of 1s, the mean of Y), "e" is the base of the natural logarithm (about 2.718) and β are the parameters of the model, and " β " adjusts how quickly the probability changes with changing "x" a single unit (we can have standardized and unstandardized " β " weights in logistic regression, just as in ordinary linear regression). Because the relation between "x" and "P" is nonlinear, β does not have a straightforward interpretation in this model as it does in ordinary linear regression.¹

Where β_0 is called the "intercept" and $\beta_1, \beta_2, \beta_3$, and so on, are called the "regression coefficients" of x_1, x_2, x_3 respectively. The intercept is the value of y when the value of all independent variables is zero (e.g., the value of z in someone with no risk factors). Each of the regression coefficients describes the size of the contribution of that risk factor. A positive regression coefficient means that the explanatory

¹ The official web site of the university of South Florida, Idem.

variable increases the probability of the outcome, while a negative regression coefficient means that variable decreases the probability of that outcome; a large regression coefficient means that the risk factor strongly influences the probability of that outcome; while a near-zero regression coefficient means that that risk factor has little influence on the probability of that outcome.¹

In our study; we are going to use logistic regression rather than ordinary linear regression to analyse our survey findings taking INNO as a dependent variable which is binary for so many reasons including the following ones:

II.2.2. Why use logistic regression rather than ordinary linear regression?

There are three main reasons for which statisticians prefer to use logistic regression rather than ordinary linear regression and they are as follows:

1. *In linear regression, the predicted values will become greater than one and less than zero if you move far enough on the X-axis. Such values are theoretically inadmissible.*
2. *One of the assumptions of regression is that the variance of Y is constant across values of X (homoscedasticity)². This cannot be the case with a binary variable, because the variance is PQ. When 50 percent of the people are 1s, then the variance is .25, its maximum value. As we move to more extreme values, the variance decreases. When P=.10, the variance is .1*.9 = .09, so as P approaches 1 or zero, the variance approaches zero.*
3. *The significance testing of the b weights rest upon the assumption that errors of prediction (Y-Y') are normally distributed. Because Y only takes the values 0 and 1, this assumption is pretty hard to justify, even approximately. Therefore, the tests of the regression weights are suspect if you use linear regression with a binary dependent variable.³*

II.2.3. Features of the Logit Model

We can cite so many features for a Logit Model, but we think that it would be enough to name only the following ones, which are:

1. We know that $0 \leq p_i \leq 1$, and then the Logit L must go from $-\infty$ to $+\infty$. That is, although the probabilities lie between 0 and 1, the Logits are not so surrounded.

¹ www.wikipedia.org

² A sequence or a vector of random variables is homoscedastic if all random variables in the sequence or vector have the same finite variance. This is also known as homogeneity of variance. The complementary notion is called heteroscedasticity. The assumption of homoscedasticity simplifies mathematical and computational treatment. Serious violations in homoscedasticity (assuming a distribution of data is homoscedastic when in actuality it is heteroscedastic) result in overestimating the goodness of fit as measured by the Pearson coefficient. (for further information, see <http://en.wikipedia.org/wiki/Homoscedasticity>)

³ The university of South Florida; <http://luna.cas.usf.edu/~mbrannic/files/regression/Logistic.html>; May 2010.

2. Although L is linear in X, the probabilities themselves are not.

3. The interpretation of a Logit Model is as follows:

$\beta_{1,2,3,4,\dots,n}$; the Slope, measures the change in L for a unit change in $x_{1,2,3,4,\dots,n}$ and so, it tells how the log odds in favour of being innovative within the Algerian firm as each of the independent variables changes by unit. The intercepts β_0 is the value of the log odds in favour of being innovative if the result of the independent variables is "0" (Zero).

4. We can estimate the probability of the firm to be innovative by giving certain values of the independent variables; let say X^* , but we must at first obtain the estimates of $\beta_0, \beta_1, \beta_2, \beta_3, \beta_4, \dots, \beta_n$.

5. The linear probability model supposes that P_i is linearly related to x_i , the Logit Model assumes that the log of odds ratio is linearly related to x_i .

II.2.4. Estimation of the Logit Model:

To estimate a Logit model we need apart from x_i , the values of Logit L_i , in fact we cannot estimate the equation of the Logit model L_i which has been already given above by using OLS techniques. And then, we have to resort to Maximum Likelihood method of estimation. In case of grouped data; corresponding to each income level x_i , there are N_i Algerian firms including

n_i firms which are innovative. Consequently; we need to calculate
$$\hat{P}_i = \frac{n_i}{N_i}$$

This relative occurrence is an estimate of true P_i corresponding to each x_i . Using the estimated \hat{P}_i we can obtain the estimated Logit as follows;

$$\hat{L}_i = \text{Log}\left[\frac{\hat{P}_i}{(1-\hat{P}_i)}\right]$$

Where; $\Rightarrow \hat{P}_i = \frac{1}{1 + \exp(-\hat{Y}_i)}$

And $\hat{Y}_i = \hat{\beta}_0 + \hat{\beta}_1 x_1 + \hat{\beta}_2 x_2 + \hat{\beta}_3 x_3 + \hat{\beta}_4 x_4 + \dots + \hat{\beta}_n x_n$

Moreover; here are some steps to estimate Logit Regression,

1. at first we compute the estimated probability of being innovative for the changes in the independent variables x_i , as follows;

$$\hat{P}_i = \frac{n_i}{N_i}$$

2. For each independent variable x_i , we will obtain the Logit as the following equation;

$$\hat{L}_i = \text{Log}\left[\frac{\hat{P}_i}{(1-\hat{P}_i)}\right]$$

3. then we transform the logit regression in order to resolve the problem of

heteroscedasticity¹ where the weight $W_i = N_i P_i / (1 - P_i)$ as follows:

$$\sqrt{W_i} L_i = \beta_1 \sqrt{W_i} + \beta_2 \sqrt{W_i} X_i + \sqrt{W_i} U_i \dots (8)$$

4. Calculate approximately (8) by OLS.
5. establish confident intervals and/or hypothesis in the usual OLS framework

¹ A sequence of random variables is heteroscedastic, or heteroskedastic, if the random variables have different variances. The term means "differing variance". (for further information see <http://en.wikipedia.org/wiki/Heteroscedastic>)

6. Otherwise; each and every one the conclusions will be valid strictly only when the sample is reasonably large. Which is not the case in our study mainly because it has been too difficult to take more firms in our sample due to time and budget issues...

II.2.5. Qualities of Logit Model:

There exist several merits of Logit Model; but we cite some of them only as follows;

1. Logit analysis produces statistically sound results; by allowing for the transformation of a dichotomous dependent variable to a continuous variable ranging from $-\infty$ to $+\infty$, the problem of out of range estimates is avoided.
2. It provides results which can be easily interpreted and the technique is simple to evaluate and analyse.
3. it gives also parameter estimates which are asymptotically consistent, efficient and normal, so that the analogue of the regression t-test can be applied.

II.2.6. Demerits of Logit Model:

1. The distribution term Logit model is heteroscedastic and therefore, we should go for Weighted Least Squares (WLS).
2. N_i has to be fairly large for all x_i , and thus in small sample; the estimated results should be interpreted carefully.
3. There may be problem of multicollinearity if the explanatory variables are related among themselves.
4. As in linear probability models, the conventionally measured R^2 is of limited value to judge the goodness of fit...

II.3. Variables Description

the Variable INNO is a dichotomous qualitative variable which takes the value 1 if the firms has already undertaken process or product Innovation within the Algerian market and the value 0 otherwise, while the variable RD is a dichotomous qualitative variable also, which takes the value 1 if the firm has R&D activities and 0 otherwise.

In case the firm has R&D activity we define another variable RDI as R&D intensity which means the share of R&D costs in the total of expenditures dedicated to Innovation, RDI is codified over an ordinal scale of 0-4, but as we have seen from our survey, almost all Algerian firms do not have R&D departments, and then both R&D and Innovation activities are included

in other activities such as production. So that we have taken RDI through asking the managers about it, in our questionnaire but it does not rely on numbers or fact but only on the respondent's view point, which may be wrong. Algerian firms seem to have a very little rates of R&D expenditures so that the proportion of the turnover to Innovation activities is very low, from our study we found that Algerian Firms' expenditures of Innovation includes the cost of employees' training, product improvements and patents acquisition...

SIZE is a multinomial variable to measure the size of the firms and is codified aver an ordinal scale also of 1-4. Where 1 corresponds to firms with 1-9 employees, 2 for firms which have between 10 and 49 employees, 3 corresponds to firms which have between 50 and 249 for the number of the employees who work inside these firms, while 4 is for firms with more than 250 employees.

MKGI (Marketing Intensity) is a variable that measures the expenditures on marketing activities as a proportion of the firm's turnover and it is codified over an ordinal scale ranged from 0-4; where 0 for the lowest expenditures proportion and 4 for the highest proportion.

COO is the cooperation made by the firm with other economic, organizational and social actors including universities, research centres, Labs, both local and foreign firms and institutions... this variable (COO) is codified over an ordinal scale of 0-4 to measure the average of cooperation between the firms questioned and the other organization through having in mind the number of the firm's partners, where 0 for the lowest rates of Cooperation between the firm questioned and other firms and organizations, and 4 is for the highest rates of cooperation.

MAR is the variable which measures the degree at which the Marketing function and activities are integrated into other departments and especially during new product development stages, and it is codified over an ordinal scale ranged from 0-4; where 0 for the lowest rates of integration between Marketing and other departments and functions within the same firm, and 5 for the highest rates of integration.

QI is a variable that measures the skilled employees intensity and is calculated on the basis of the proportion of qualified and high qualified employees including managers and high qualified personnel in the administrative, technical and R&D departments... over the Total number of the firm's employees. This variable (QI) is codified over an ordinal scale ranged from 0-4; where 0 for the lowest skilled proportion and 4 for the highest proportion.

OBLEV is a variable that measures the level of obstacles which face the firm to be innovative, this variable is codified over an ordinal scale ranged from 0-4; where 0 for the lowest levels of Innovation obstacles, and 5 for the highest levels of obstacles, but we must add here that it is

sometimes due to the sector in which the firm performs, because in some sectors there are more Innovation obstacles than in others.

II.4. Our findings and discussion

As a first part of our analysis we are going to analyse our sample and findings through using descriptive statistical methods, which allow us to now more if we have chosen the right and good way to do our empirical study or not.

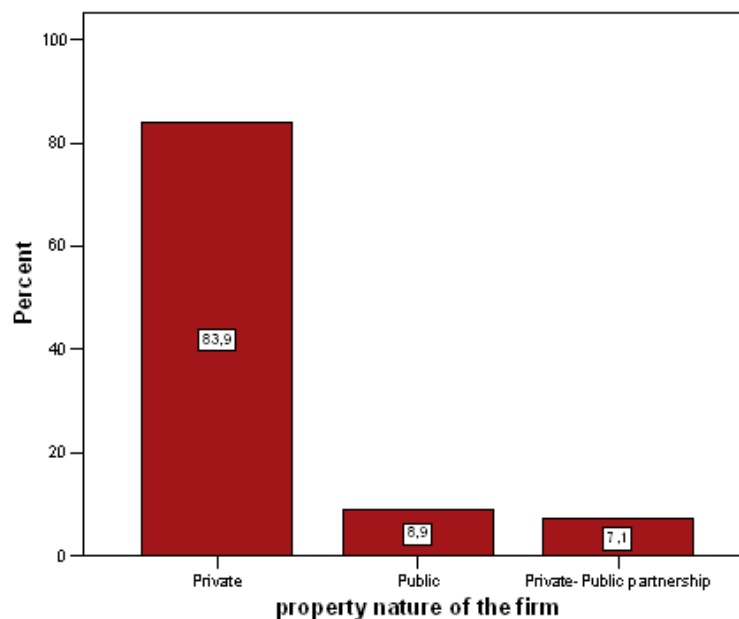
a. The sample's property nature

Table 13: Property nature of the firm (drawn by the Author)

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Private	47	83,9	83,9	83,9
Public	5	8,9	8,9	92,9
Private-Public partnership	4	7,1	7,1	100,0
Total	56	100,0	100,0	

Source : the author

Figure 19: Property nature of the firm



Drawn by the Author

We can see from the table above that our findings concern 56 industrial firms from which 47 (which means 83.9 %), while 5 of the firms taken by our sample are public (about 8.9%) and 4 are jointly shared between the private and the public sectors (which is about 7.1 %), the problem over here and in almost all our study, is the fact that our sample is somehow limited, mainly for the reason that 1 firm only may create the difference in our findings because it

represents about 2 %; but it has been so difficult for us as we have noticed before in this work, to take other firms in our research. The chart below is a little demonstration of the table's results; it is in fact more clear and easy to read data from a chart than from a table and then we are going to make a chart for each table concerning our findings, in ways that facilitate the understanding.

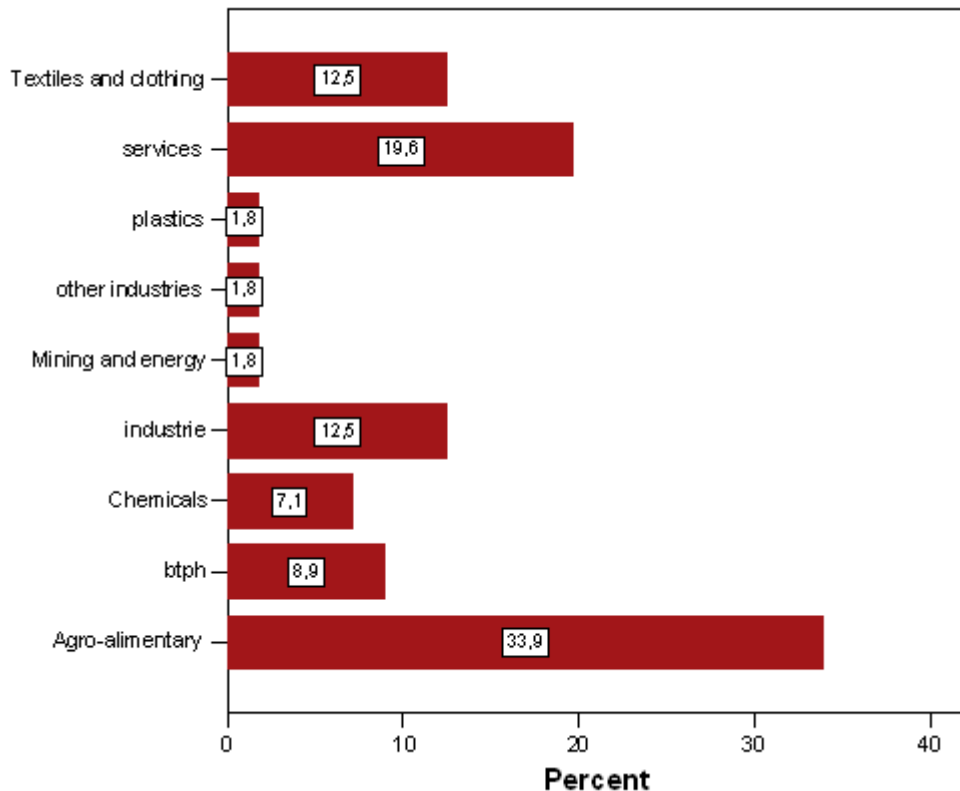
b. Distribution of Firms by sector

Table 14: Distribution of Firms by sector in the Sample

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Agro-alimentary	19	33,9	33,9	33,9
btpb	5	8,9	8,9	42,9
Chemicals	4	7,1	7,1	50,0
industrie	7	12,5	12,5	62,5
Mining and energy	1	1,8	1,8	64,3
other industries	1	1,8	1,8	66,1
plastics	1	1,8	1,8	67,9
services	11	19,6	19,6	87,5
Textiles and clothing	7	12,5	12,5	100,0
Total	56	100,0	100,0	

Source: the Author

Figure 20; Distribution of Firms by sector in the Sample



Source: the Author

since the start of our empirical study we found that a huge proportion of industrial firms are either specialized in the agro-alimentary or in services, we note here that our sampling was random and we didn't chose neither the firms nor the sectors in which they are active, the findings demonstrate that our sample included 19 agro-alimentary firms (which means 33.9 % of our sample) while 11 service industries (19.6% of the sample) were included also in the study, and there are also 7 Textiles and clothing firms and other 7 non specified industrial firms (which is 12.5 % of our sample; each), while 5 firms (8.9 %) which are active in construction (called btph in table above and the chart below), while 4 chemical firms were included also and there are other 3 firms were included in the sample (1 Mining and energy, 1 Plastics, and other one didn't specify the sector in which it works).

c. The Firms size:

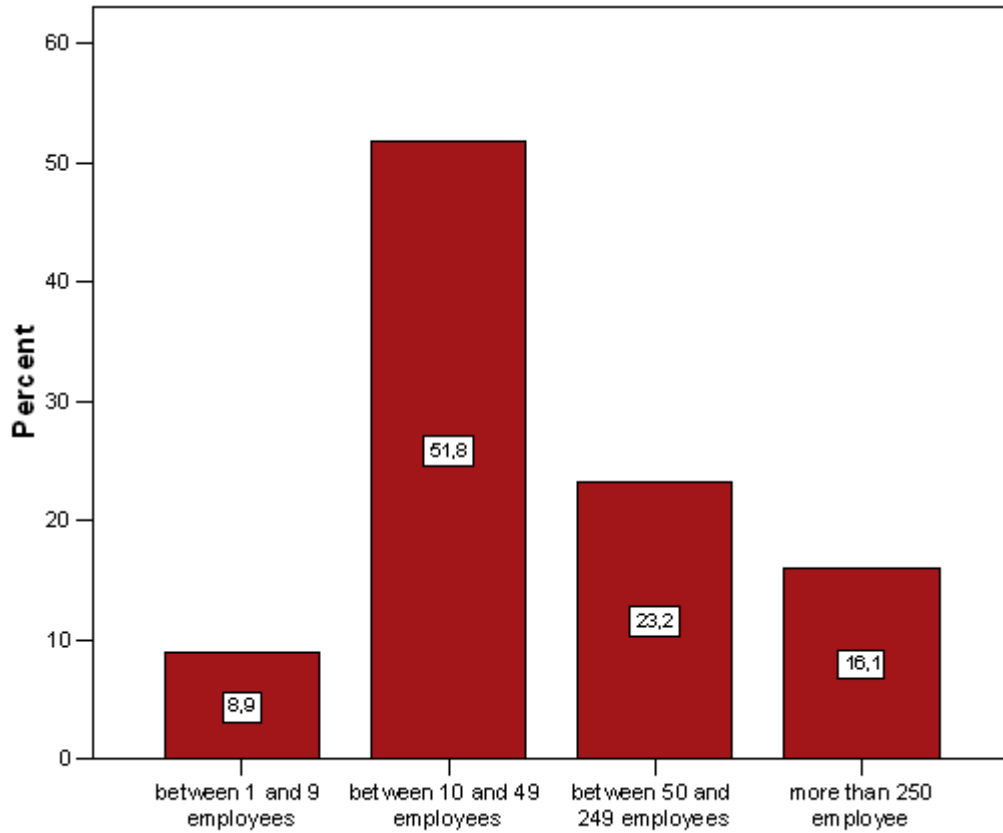
Table 15: The firm size

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid between 1 and 9 employees	5	8,9	8,9	8,9
between 10 and 49 employees	29	51,8	51,8	60,7
between 50 and 249 employees	13	23,2	23,2	83,9
more than 250 employee	9	16,1	16,1	100,0
Total	56	100,0	100,0	

Source: the Author

From the table 15 and the figure 20 above we see that a massive proportion of the firms which are included in our sample were those which have between 10 to 49 employees and they are 29 firms which gives 51.8 % of the total number of the firms taken by this study, while 13 firms of our sample have between 50 and 249 employees (means 23.2 %) and either firms which have more than 250 employees or those which include less than 10 employees were fewer; both of them, by frequencies of 9 (16.1% of the whole sample) and 5 (8.9 %) firms respectively. The figure 20 explains well, and we can see from it that the firms taken by our sample were those which include between 10 and 49 employees, this was a fact for the reason that we have been trying to include the firms which at least have marketing departments, in ways that allow us to see the effects of the marketing departments on other departments during new product development stages, as well as to see if the marketing departments do help firms to enhance their competitiveness within the local market or not.

Figure 21: The firm size



Source: the Author

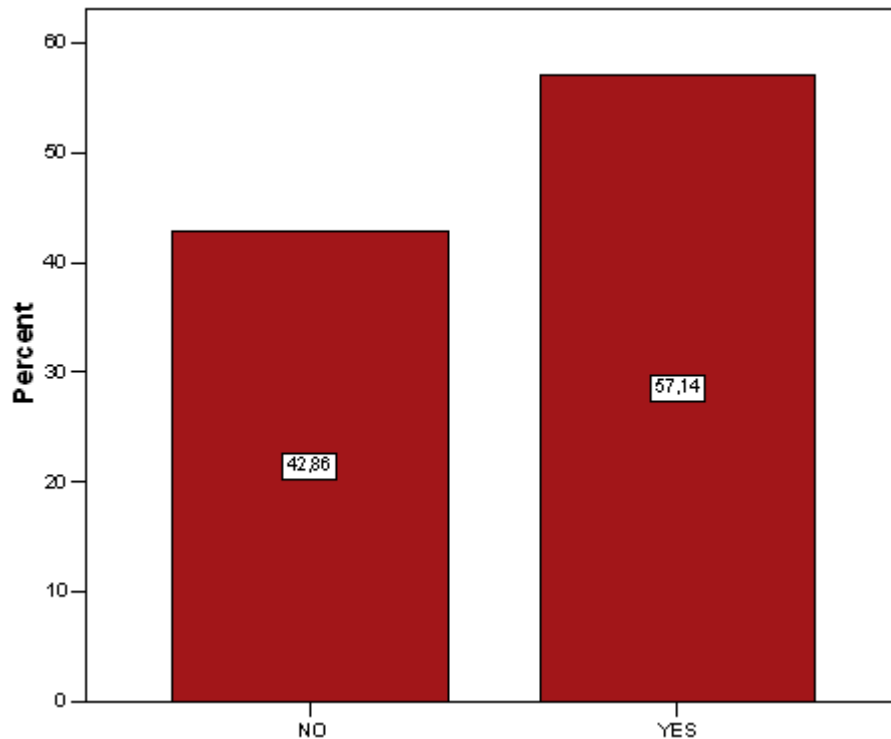
d. Marketing department existence:

Table 16: Whether the firm has a Marketing department or not

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	NO	24	42,9	42,9	42,9
	YES	32	57,1	57,1	100,0
	Total	56	100,0	100,0	

Source: the Author

Figure 22: Whether the firm has a Marketing department or not



Source: the Author

In this work we are trying to see what impact has marketing effort on product development processes' success, and then we have devised our sample into two kind of firms those which have marketing departments and those which do not have marketing departments, our findings demonstrate that 42.9 % of the firms taken by our study do not have marketing departments while 57.1 % of the whole sample do have marketing departments, but this does not mean that those which do not have marketing departments do not make any marketing efforts, almost of them do some efforts which may be included to marketing efforts such as advertising, direct mailing, direct selling, after sales services, packaging and so on, but they do not call those activities as Marketing activities, and they do not treat those activities at the same department.

This study puts a stress on firms which have R&D departments, so that our questionnaire contains a question to check out whether the firm has Research and Development department or not; this question helped us to separate our sample into two parts, the first part includes the firms which have R&D departments and it includes 12 firms only, (which means 21.4% of the whole sample) and the second part takes firms which do not have R&D departments, this latter includes 44 firms (78.6 % of the whole sample), we also not here that almost all Algerian Firms do not have R&D departments, and even if they do some R&D efforts, they do not include those efforts and spending to R&D efforts in their accounting systems . (The table and chart below

show how the repartitions of the sample due to the existence of R&D departments within the firms).

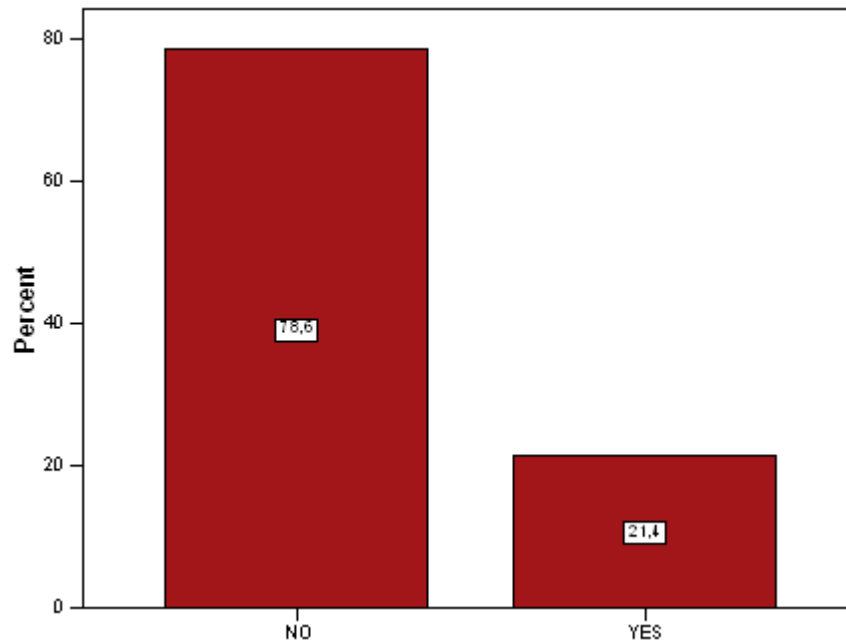
e. R&D department existence:

Table 17: Whether the firm has Research and Development department or not

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	NO	44	78,6	78,6	78,6
	YES	12	21,4	21,4	100,0
	Total	56	100,0	100,0	

Source: the Author

Figure 23: Whether the firm has Research and Development department or not



Source: the Author

This question aims to separate the firms which do have R&D departments from those which do not have any R&D departments nor activities inside their structures; the results show that 21.4 % of the firms taken by this study, have R&D departments and the rest (means 78.6%) do not have R&D departments, we have to notice here that 21.4 % is a good intensity of firms which have R&D departments, but in our case 21.4 % means only 12 firms, and this cannot be enough to get good results either for the descriptive study or for the models fitting. Anyway, almost all the sample are firms with less than 500 employees and the literature shows that companies with less than 500 employees do not have R&D departments, mainly because it costs them more than they afford for research and development assets. And by the way, some small and medium sized companies have already launched some R&D activities even if they do not have R&D departments.

f. The sample’s innovativeness:

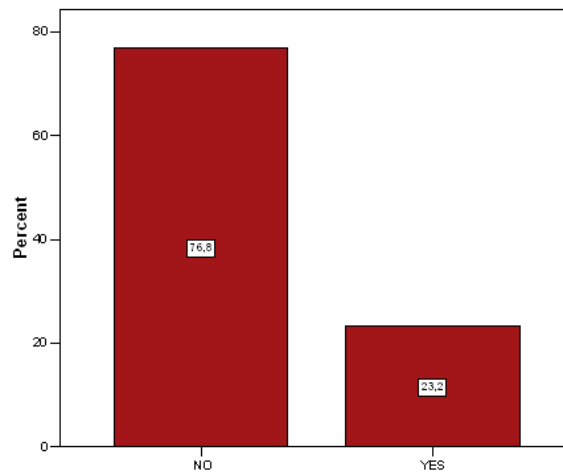
Here we tried to see whether the firm is innovative or not, so that we named a variable INNO this variable is a dichotomous qualitative variable which takes the value 1 if the firms has already undertaken process or product Innovation within the Algerian market and the value 0 otherwise, while the variable RD is a dichotomous qualitative variable also, which takes the value 1 if the firm has R&D activities and 0 otherwise; our findings show that some Algerian firms do innovate even if their efforts in this domain is still limited we see from the table below that about 23.2 % of our sample are innovative firms while the rest (67.8%) are not innovative,

Table 18: Whether the firm is innovative or not

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	NO	43	76,8	76,8	76,8
	YES	13	23,2	23,2	100,0
	Total	56	100,0	100,0	

Source: the Author

Figure 24: Whether the firm is innovative or not



Source: the Author

However, almost all the firms’ managers or qualified employees who we interviewed admit that there exist so many reasons and obstacles which lessen their possibilities to innovate within the Algerian market, and since we have studied the theoretical background of Innovation, we found that firms all over the world face this kind of obstacles but obviously these obstacles are somehow many and difficult in the Algerian local market, we will try to see which obstacles do exist the most in the Algerian market, later in this chapter.

g. The employees training:

As we know, training is a good tool to be used in order to enhance the employees skilfulness as well as their knowledge, but not all the firms do encourage their employees through outside

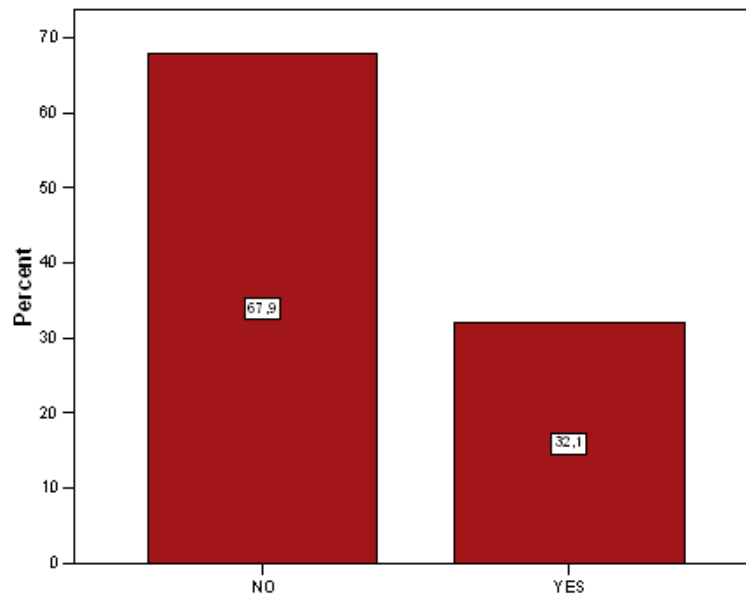
training even for small periods, mainly for the reason to limit the expenditures on employees training, and as we can see from the table and the chart below about 67.9 % of the firms included in our sample do not train their employees outside the firm, while only 32.1 % of all the sample do have such a policy to develop the knowledge and skills of their employees, those firms are relatively big firms and have a serious strategy in this domain, they also designate a good proportion of their expenditures on employees training which allow their employees to learn new knowledge and skills from other people and organizations.

Table 19: Whether the Employees Profit from some Training Missions outside the Firm or Not

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	NO	38	67,9	67,9	67,9
	YES	18	32,1	32,1	100,0
	Total	56	100,0	100,0	

Source: the Author

Figure 25: Whether the Employees Profit from some Training Missions outside the Firm or Not



Source: the Author

h. The sample partnership with other firms during products development stages:

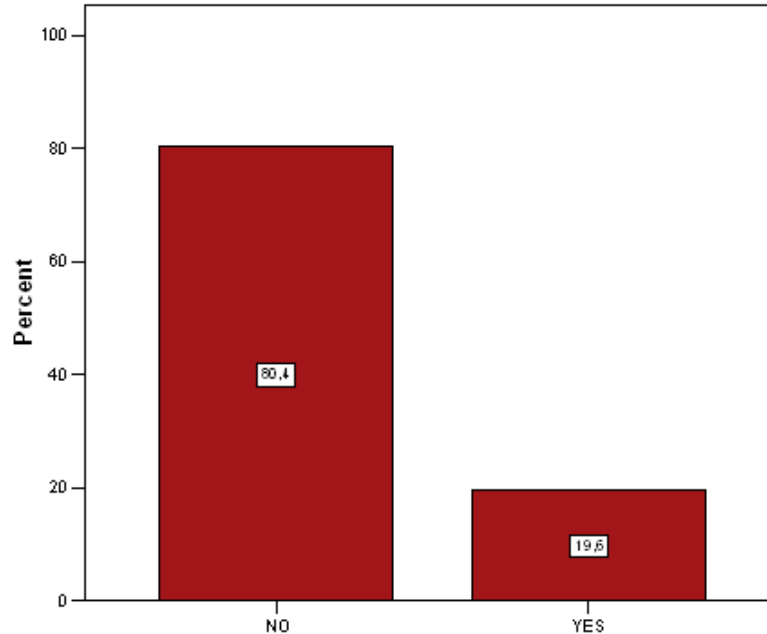
Our questionnaire included a question which measures the technical partnerships of the firms the results have shown that 19.6 % of our sample answered that they do have at least one technical partner to help them in their products improvements and/or developments, while the rest (80.4 % of the sample) do not have technical partners, this shows that almost all of the local firms do not rely on partnerships in order to improve and develop their products even if they do really need to make such partnerships. (See the table 20 and the figure 26 below).

Table 20: Whether the firm has technical partners or not

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	NO	45	80,4	80,4	80,4
	YES	11	19,6	19,6	100,0
	Total	56	100,0	100,0	

Source: the Author

Figure 26: Whether the firm has technical partners or not



Source: the Author

i. Innovation obstacles in Algeria:

Our questionnaire included so many questions about Innovation obstacles and the difficulties that face firms in their way to be innovative; in order to measure the degree of Innovation obstacles in Algeria. Anyway, as mentioned before OBLEV is the variable that measures the level of obstacles which face the firm to be innovative, this variable is codified over an ordinal scale ranged from 0-4; where 0 for the lowest levels of Innovation obstacles, and 5 for the highest levels of obstacles, but we must add here that it is sometimes due to the sector in which the firm performs, because in some sectors there are more Innovation obstacles than in others. Our findings were as follows:

39.3 % of our sample answered that they do agree strongly with the opinion which says that Innovation obstacles degree is so high in Algeria, while 26.8 % of the sample answered that they agree with that opinion, giving a level of $\frac{3}{4}$ of their acceptance, 16.1 % of the firms said that they do neither agree nor disagree of that opinion giving a level of 2 to that question, while 16.1 % answered that they do not agree with that judgment, and the rest of the whole sample (1.8%) said that they strongly do not agree with our opinion, these results show us that a huge proportion of the firms questioned see that Innovation obstacles are relatively too many and

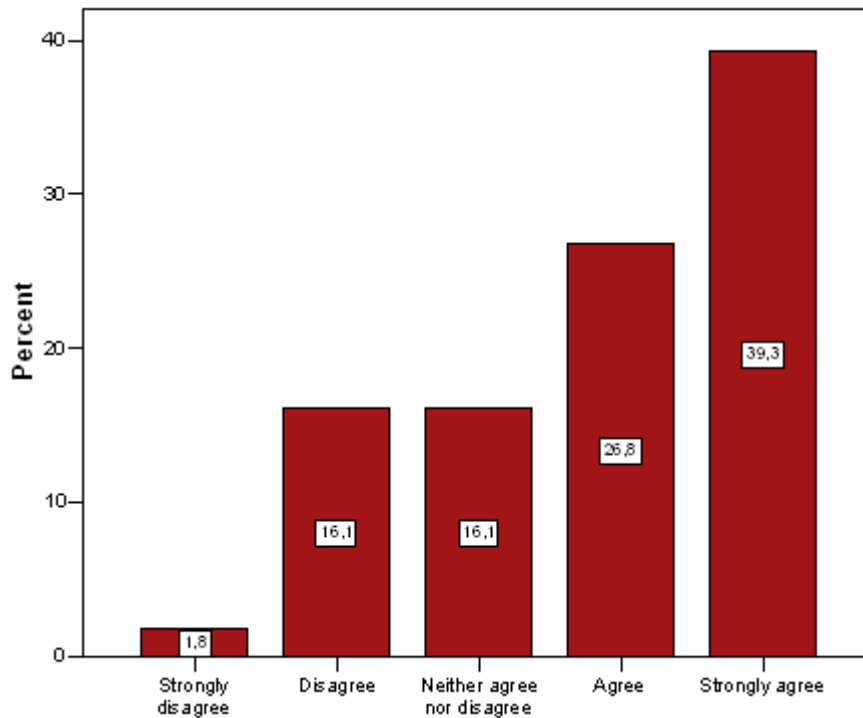
that it is too hard to face those obstacles, the thing which necessitates the intervention of the whole economic sector including governmental and non-governmental organizations, and not only industrial firms.

Table 21: The levels of obstacles that face the Innovation activities of firms are so high

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly disagree	1	1,8	1,8	1,8
Disagree	9	16,1	16,1	17,9
Neither agree nor disagree	9	16,1	16,1	33,9
Agree	15	26,8	26,8	60,7
Strongly agree	22	39,3	39,3	100,0
Total	56	100,0	100,0	

Source: the Author

Figure 27: The levels of obstacles that face the Innovation activities of firms are so high



Source: the Author

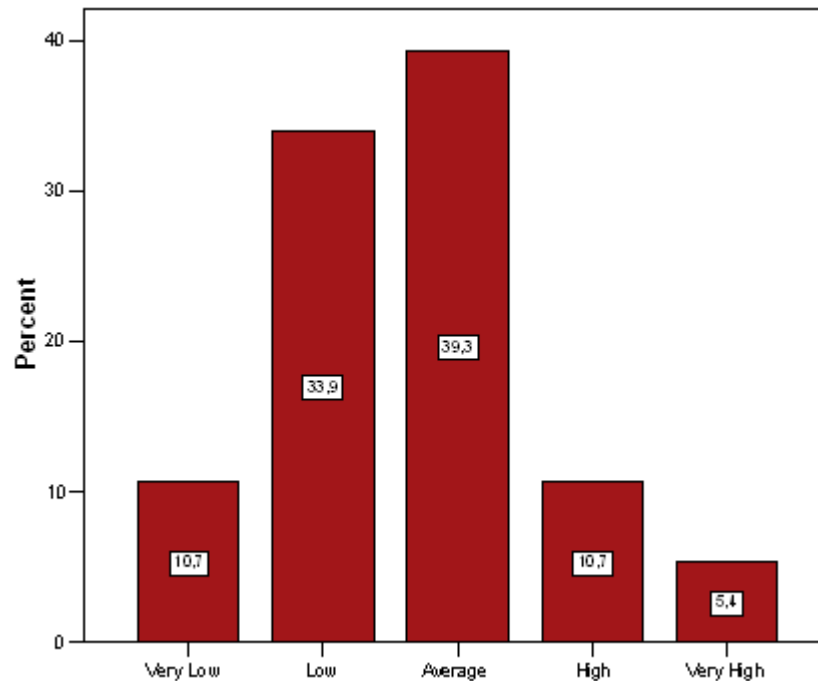
j. Marketing Intensity of the firms:

Table 22: the firms' Marketing Intensity

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Very Low	6	10,7	10,7	10,7
Low	19	33,9	33,9	44,6
Average	22	39,3	39,3	83,9
High	6	10,7	10,7	94,6
Very High	3	5,4	5,4	100,0
Total	56	100,0	100,0	

Source: the Author

Figure 28: the firms' Marketing Intensity



Source: the Author

Our questionnaire included some questions that can be answered to get only one variable named MKGI which is a variable that measures the Marketing intensity of the firms questioned it is codified over an ordinal scale ranged from 0-4; where 0 for the lowest expenditures proportion of the firm's turnover and 4 for the highest proportions of expenditures on marketing activities. Our findings (as shown in the table and chart above) were as follows: 39.3 of the sample are firms which have an average of expenditures on marketing activities, while 33.9 % of the firms questioned have low expenditures on their marketing activities, the firms which expend pretty much less than the average of the expenditures on marketing activities represent 10.7 %, while those which expend more than the average represent also 10.7 % of the whole sample, and the rest of our sample (5.4 %) are firms which have the highest proportions of expenditures on marketing activities, almost all of them were service industries. This distribution of the firms according to their expenditures on marketing activities is considered to be wrong because firms all over the world either small micro-enterprises or multinationals expend high proportions on marketing even more than their expenditures on production, because they are sure that Marketing expenditures cannot be considered as costs, and this what help those firms being successful through raising their turnovers through using several marketing tools; so that Algerian firms must at least raise their marketing expenditures, in ways that help them knowing their customers' needs to be able producing the right products for

those customers. This will somehow bring profit to the firm so that it can regenerate other profits through its expenditures on marketing.

k. R&D expenditures:

As we have seen before in this study, R&D expenditures are so necessary for any innovative activity, but the fact are pretty much unlikable when it comes to Algerian Firms' expenditures on R&D, because they seem to spend much less even than other Arab firms, and this what makes the Algerian gross domestic expenditures on R&D so limited (about 0.07% while it is 1.03 % in Tunisia and 0.66% in Morocco); our empirical study findings were similar to our theoretical study because it shows that 53.6 % of the R&D expenditures of the whole sample that we have taken for our study are considered to be very low, while 21.4% of the firms answered that they spend low amounts of money on innovative and R&D activities; this gives a cumulative percent of 75,0 % of firms which do not spend a lot of money on their R&D activities, whereas 8.9 % said that they expend typical amounts on R&D activities, which is neither much nor little, but it ensures the continuity and performance of innovative activities within the firm; at the same time as 16.1 % of our sample expend high proportions on their R&D activities, (0% of our sample answered that their expenditures are very high as seen in the table and chart below.)

1. The firms' cooperation:

Theoretically cooperation between firms and other organizations (including universities, research centres, Labs, both local and foreign firms and institutions) is considered to be a key driver of Innovation and innovative activities, a diverse range of advantages may derive from collaboration and cooperation in the Innovation process. Womack *et al.* (1991)¹ in their discussion of lean production, for example, emphasize the potential role of collaboration as a means of accessing external expertise to allow concurrent development to take place and accelerate the product development process (e.g., Womack *et al.*, 1991, pp. 109-10). Networks may also allow firms to take advantage of potential agglomeration and informational advantages in both high-tech and more traditional sectors². In our study cooperation is studied through a variable named COO which is codified over an ordinal scale of 1-5 to measure the average of cooperation between the firms questioned and the other organization through having in mind the number of the firm's partners; anyway, about 42.9 % of the firms included

¹ Womack, J. P., Jones, D. T. and Roos, D. 1991. *The Machine that Changed the World*, New York, Harper Perennial; cited in Love J. H. and Stephen Roper; (2004), "The organization of Innovation: collaboration, cooperation and multifunctional groups in UK and German manufacturing"; Cambridge Journal of Economics, 28, 379-395.

² Love J. H. and Stephen Roper; (2004), "The organization of Innovation: collaboration, cooperation and multifunctional groups in UK and German manufacturing"; Cambridge Journal of Economics, 28, 379-395

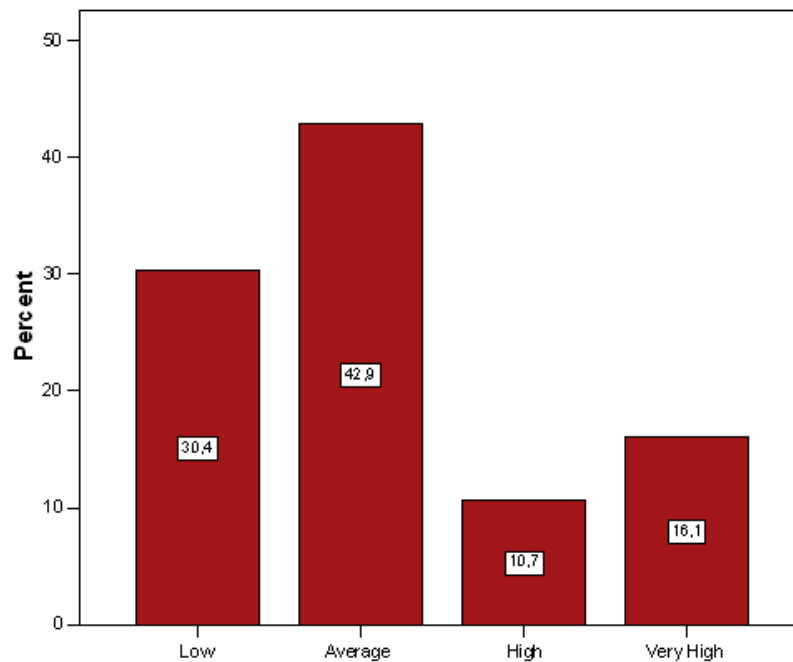
by this study have answered that they have typical rates of cooperation with other organizations, while 30.4 % said that they have low rates of cooperation, whereas 16.1 % have the highest rates of cooperation and 10.7 % cooperate less with the other organizations and partners. So that Algerian firms have to cooperate with each others as well as with other organizations, in ways to learn other processes and manners of doing things, which might help them being much performing and innovative. (See the table and the chart below)

Table 23: The cooperation between the firm questioned and other firms and organization

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Low	17	30,4	30,4	30,4
Average	24	42,9	42,9	73,2
High	6	10,7	10,7	83,9
Very High	9	16,1	16,1	100,0
Total	56	100,0	100,0	

Source: the Author

Figure 29: The cooperation between the firm questioned and other firms and organization



Source: the Author

m. Marketing integration:

From the table and chart below we see that 35.7 % of the sample has low marketing integration degrees while almost 9 % have very low degrees, and other 14.3 % have average degrees, this may affect the results of our models later and especially that we are trying to check out the impact of marketing integration as a part of interdepartmental integration on the innovation activities and capabilities of the firms taken by this research, and especially that the sample is

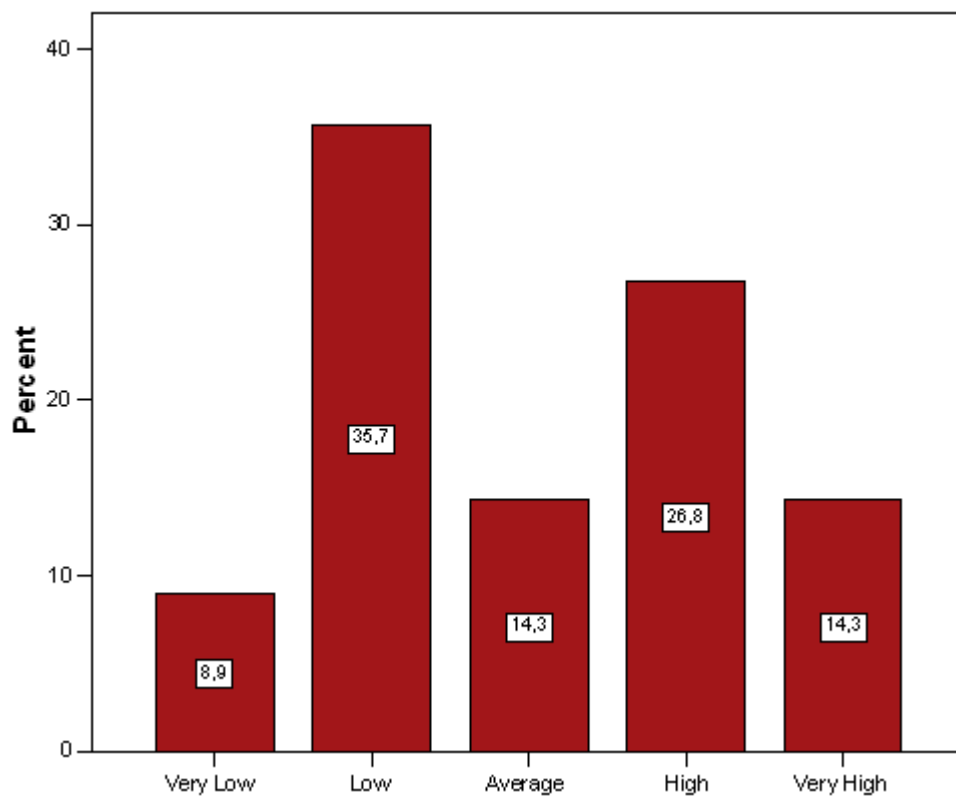
somehow limited and that may reduce the ability to take only firms which do have higher marketing integration; that represent about 40 % of the whole sample, which means 23 firms. Later in this chapter we will discuss the correlations found between innovation and interdepartmental integration.

Table 24: the degree at which the Marketing function and activities are integrated into other departments and especially during new product development stages

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Very Low	5	8,9	8,9	8,9
Low	20	35,7	35,7	44,6
Average	8	14,3	14,3	58,9
High	15	26,8	26,8	85,7
Very High	8	14,3	14,3	100,0
Total	56	100,0	100,0	

By the Author

Figure 30: the degree at which the Marketing function and activities are integrated into other departments and especially during new product development stages,



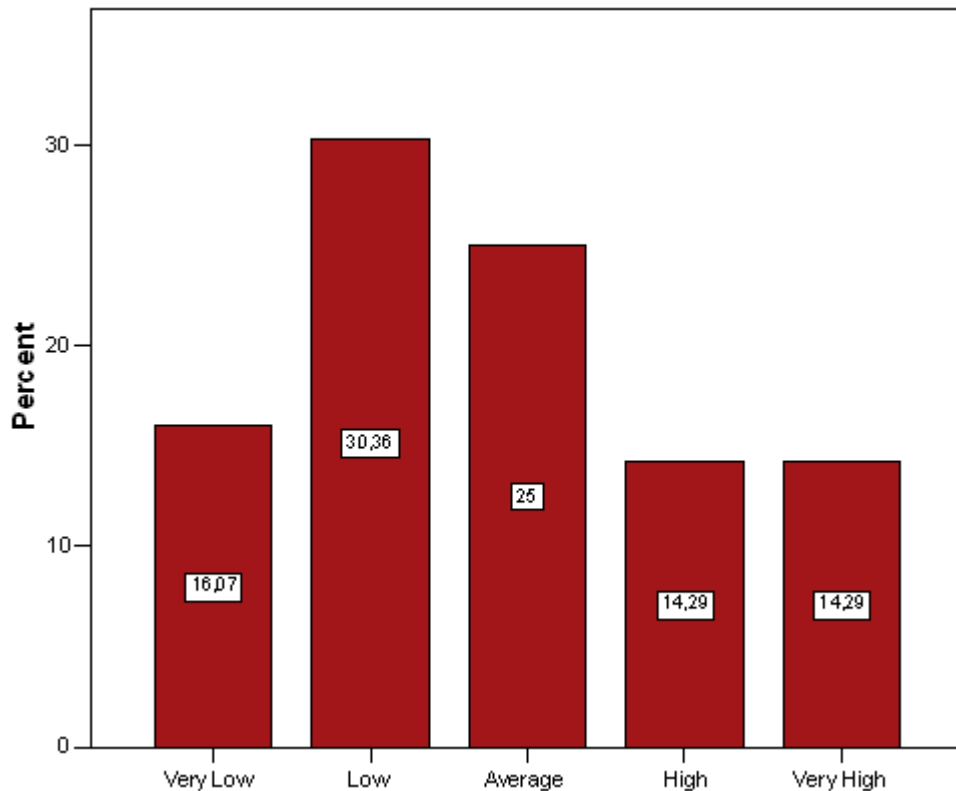
Source: the Author

n. Qualified employees' intensity:

In this study we take a Variable QI which is a variable that measures the skilled employees intensity and is calculated on the basis of the proportion of qualified and high qualified employees including managers and high qualified personnel in the administrative, technical

and R&D departments... over the Total number of the firm’s employees. This variable (QI) is codified over an ordinal scale ranged from 0-4; where 0 for the lowest skilled proportion and 5 for the highest proportion. Our findings were distributed as follows; 30.4 % of the whole sample answered that they have low intensities of high qualified employees, while 25 % of the total number of the firms included by our study have middle rates of qualified employees intensity, 16.1 % of our sample have very low rates of skilled employees’ intensity, and a percentage of 14.3 % of our sample has high rates of QI whereas other 14.3 % of the firms questioned said that they have very high rates of qualified and skilled employees in the different departments and activities within these firms reached by our study.

Figure 31: The firms’ skilled employees’ intensity



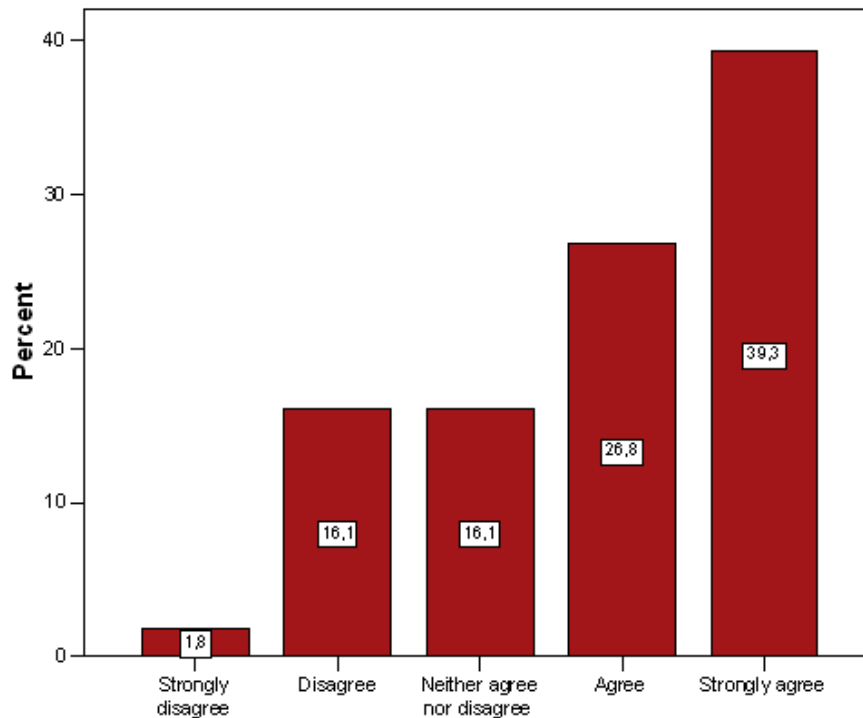
Source: the Author

o. The Innovation obstacles’ levels:

This study was launched mainly to know whether marketing and innovative activities within Algerian firms are related to create such a good performance of those firms included by our empirical study, but while we were making the pre-tests of this study we found out that many firms have several reasons and obstacles for which they are not innovative, even though they do have the principal characteristics to be innovative (those problems were mainly Financial access/support difficulties, product development problems, organizational and institutional

obstacles , Marketing needs, the local infrastructure needs, taxes, property rights...), anyway, we tried to know and measure the level of those problems and obstacles so that we take a variable named OBLEV, this variable measures the level of obstacles which face the firm to be innovative, this variable is codified over an ordinal scale ranged from 0-4; where 0 for the lowest levels of Innovation obstacles, and 5 for the highest levels of obstacles, but we must add here that it is sometimes due to the sector in which the firm performs, because in some sectors there are more Innovation obstacles than in others. Our findings show that about 66.1 % of the whole sample included in this study either agree or agree strongly with the opinion saying that “The levels of obstacles that face the Innovation activities of firms are very high within the Algerian market” they represent 26.8 %, and 39.3 % respectively, while 16.1 % of the firms say that they do not agree with that opinion and the same percentage (16.1 %) say that they do neither agree nor disagree with that opinion, and the rest of the whole sample (1.8 %) says that The levels of obstacles that face the Innovation activities of firms are not high. (See the figure 32 which is below).

Figure 32: the level of obstacles that face the Innovation activities of firms.



Source: the Author

II.5. Our Model:

In order to examine the different hypotheses of our research, we suggest two different econometric models.

Model 1:

In our first model we take the business characteristics as independent variables besides the specific characteristics of the firm as well as the whole sector of activity, for each firm. Our objective from this model is to estimate the impact of each variable on the probability of Innovation in Algerian Firms. The impact of the Innovation obstacles is taken in consideration in each of these models, as well as the firm size, the firm's cooperation with other organizations and the skilled employees. We also take we take RD as a qualitative dichotomous variable which measures whether the firm has already undertaken R&D activities or no, the variable RD takes the value 1 if the firm has R&D activities and 0 otherwise. And this Model has as objective to see whether the R&D activities in Algerian Firms have the same importance as in foreign countries or no, but obviously, most of Algerian firms do not have R&D activities and in case they do some activities which have the same characteristics either they do not call them R&D or they include these activities to other departments and functions inside the firm, such as the production activity, Quality, or even Marketing.

This Model takes in evidence the Marketing activity and its integration to other functions and activities within the same firm, in both our first and second chapter, we have seen that cooperation and marketing integration have a positive impact on the firm innovativeness as well as the Innovation performance of firms, so we aimed to measure the integration levels of marketing functions to other functions within the firm (we call them functions, for the reason that several Algerian firms do not have marketing departments but they do some basic marketing activities, while some of them have already made some ad for their products and/or services even if they do not have such a department which organize activities like those) , and the firm's cooperation with other organizations, and institutions including universities, research labs, firms and so on...

We try also to use this model in order to estimate the impact of each variable on the probability of Innovation in Algerian Firms; taking in mind the impacts of Marketing intensity (MKGI) and Marketing integration (MAR).¹

And it is like follows:

¹ In this Model; We exclude the variable (MDG) that takes in mind the existence of the marketing department within the firm, because it is not necessary for firms to have marketing departments in order to do marketing activities; and as we noted earlier in this work, there have been found so many firms which are so active in the marketing tasks and activities, but they do not have any Marketing departments neither inside their firms, nor in their accounting systems.

$$\text{INNO} = \beta_0 + \beta_1 \text{SIZE} + \beta_2 \text{RDI} + \beta_3 \text{MKGI} + \beta_4 \text{COO} + \beta_5 \text{MAR} + \beta_6 \text{QI} + \beta_7 \text{OBLEV}$$

Model 2:

$$\text{INNO} = \beta_0 + \beta_1 \text{SIZE} + \beta_2 \text{RDIN} + \beta_3 \text{MKG} + \beta_4 \text{MKGI} + \beta_5 \text{COO} + \beta_6 \text{MAR} + \beta_7 \text{QI} + \beta_8 \text{OBLEV}$$

In this Model, we try to estimate the impact of each variable on the probability of innovation in the Algerian firms; taking in mind the impacts of marketing activities (MKG), Marketing intensity (MKGI) and Marketing integration (MAR).

We, in fact, try to check the impact of all the variables taken in “model 1” out; with the exception of the existence of marketing activities, while in this time, we take only firms which have already undertaken research and development activities and which have R&D departments, but the limitation of our study appears here because only 12 firms of our sample have R&D departments and that caused a problem with the Data analysis, because then the data are not enough to fit a model like this one and then we had to include other firms which have R&D departments, in this research. We would then have better results, proving that R&D activities and intensity do have a positive effect on the firm’s innovation activities, just as we have understood from our meetings with the executives and the managers of some of these firms, we try also to link between the marketing activities integration and the firm’s cooperation mainly because there exist empirical evidences that both internal integration, and external cooperation have a positive impact on each others and that they are correlated to each other in so many ways. (See Table 47 in Appendix). Because the significance coefficient is 0.011 for the 2-tailed for the bivariate correlation between the two variables (COO, and MAR) while the correlation is significant at the 0.05 level. In this Model we take both COO and MAR as correlated variables in the second equation, and we have shown how they affect each others in our theoretical chapters.

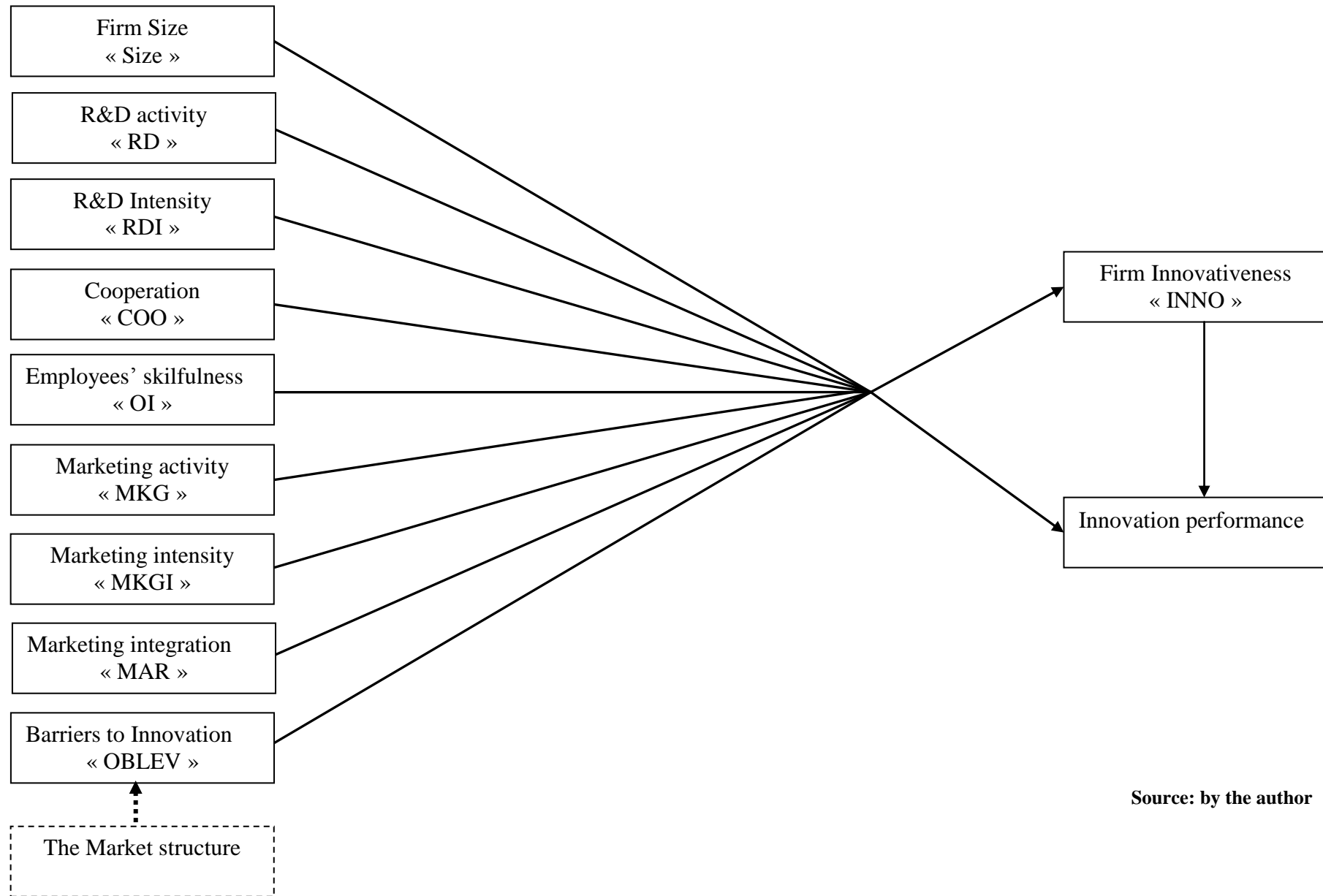
We check the effect of Marketing efforts on innovative activities of those firms with and without taking “Marketing” variables in mind, while the theoretical background of both Innovation and marketing, show the massive impact of these two concepts on each other, we still need to see the results of our study concerning those variables.

Through these two models we aim to validate or invalidate the next two hypotheses;

H0: there is no impact of the interdepartmental integration, and the firm’s cooperation as well as the R&D intensity of the firm on the firm’s innovative activities.

H1: both, Interdepartmental integration of marketing department with the other departments and the firm's cooperation with the other organizations create a synergy that helps enhancing and fostering the firm's innovativeness and innovative performance.

Figure 33: The variables that affect Innovation, and Innovation performance



Source: by the author

II.6. Our findings:

Table 25: Model 1 analysis:

Table 26-1: Case Processing Summary

Unweighted Cases(a)		N	Percent
Selected Cases	Included in Analysis	56	100,0
	Missing Cases	0	,0
	Total	56	100,0
Unselected Cases		0	,0
Total		56	100,0

a If weight is in effect, see classification table for the total number of cases.

Source : the Author.

Table 26-2 : Dependent Variable Encoding

Original Value	Internal Value
NO	0
YES	1

Source : the Author

Table 26-3 : Classification Table (a,b)

Observed			Predicted		Percentage Correct
			whether the firm is innovative or not		
			NO	YES	
Step 0	whether the firm is innovative or not	NO	43	0	100,0
		YES	13	0	,0
Overall Percentage					76,8

a Constant is included in the model.

b The cut value is ,500

Table 26-4 : Variables in the Equation

	B	S.E.	Wald	df	Sig.	Exp(B)
Step 0 Constant	-1,196	,317	14,285	1	,000	,302

Source : the Author

Table 26-5 : Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	SIZE	13,285	1	,000
		RDI	34,031	1	,000
		MKGI	11,146	1	,001
		COO	40,068	1	,000
		MAR	8,932	1	,003
		QI	28,690	1	,000
		OBLEV	9,305	1	,002
	Overall Statistics		46,187	7	,000

Source : the Author

Table 26-6 : **Omnibus Tests of Model Coefficients**

		Chi-square	df	Sig.
Step 1	Step	60,687	7	,000
	Block	60,687	7	,000
	Model	60,687	7	,000

Source : the Author

Table 26-7 : **Model Summary**

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	,000(a)	,662	1,000

a Estimation terminated at iteration number 20 because maximum iterations has been reached. Final solution cannot be found.

Source : the Author

Table 26-8 : **Classification Table(a)**

	Observed	Predicted			Percentage Correct
		whether the firm is innovative or not			
		NO	YES		
Step 1	whether the firm is innovative or not	NO	43	0	100,0
		YES	0	13	100,0
	Overall Percentage				100,0

a The cut value is ,500

Source : the Author

Table 26: Model 2 Analysis:

Table 27-1: **Case Processing Summary**

Unweighted Cases(a)		N	Percent
Selected Cases	Included in Analysis	56	100,0
	Missing Cases	0	,0
	Total	56	100,0
Unselected Cases		0	,0
Total		56	100,0

a If weight is in effect, see classification table for the total number of cases.

Source : the Author

Table 27-2: **Dependent Variable Encoding**

Original Value	Internal Value
NO	0
YES	1

Table 27-3: **Classification Table(a,b)**

	Observed	Predicted			Percentage Correct
		whether the firm is innovative or not			
		NO	YES		
Step 0	whether the firm is innovative or not	NO	43	0	100,0
		YES	13	0	,0
	Overall Percentage				76,8

a Constant is included in the model.

b The cut value is ,500
Source : the Author

Table 27-4: Variables in the Equation

	B	S.E.	Wald	df	Sig.	Exp(B)
Step 0 Constant	-1,196	,317	14,285	1	,000	,302

Table 27-5: Variables not in the Equation

	Score	df	Sig.
Step 0 Variables	SIZE	13,285	1 ,000
	RDI	34,031	1 ,000
	QI	28,690	1 ,000
	OBLEV	9,305	1 ,002
	COOMAR	29,590	1 ,000
Overall Statistics		41,511	5 ,000

Source : the Author

Table 27-6: Omnibus Tests of Model Coefficients

	Chi-square	df	Sig.
Step 1 Step	60,687	5	,000
Block	60,687	5	,000
Model	60,687	5	,000

Source : the Author

Table 49-7: Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	,000(a)	,662	1,000

a Estimation terminated at iteration number 20 because maximum iterations has been reached. Final solution cannot be found.

Source : the Author

Table 27-8: Classification Table(a)

	Observed	Predicted		
		whether the firm is innovative or not		Percentage Correct
		NO	YES	
Step 1	whether the firm is innovative or not	NO	YES	
		43	0	100,0
		0	13	100,0
	Overall Percentage			100,0

a The cut value is ,500
Source : the Author

Variables in the Equations:

Variables in the equation	Model 1	Model 2
Size	2,222	2,707
RDI	4,605	3,680
MKGI	0,644	
COO	3,243	
MAR	0,149	
QI	-2,272	-2,912
OBLEV	0,699	-2,095
(COO*MAR)		4,690
Constant	4,826	5,594

We have found a positive relationship between the dependent variable and the all independent variables except for QI for the tow Models (1 and 2), and OBLEV for the model 2, while it was insignificant for the model 1, from the study that we have made, we found a positive impact between the firm's size and R&D activities as well as the firm's innovativeness and Innovation performance, we must notice here that so many theories as well as empirical studies found that innovative firms which spend more resources on R&D and innovative activities, get bigger and bigger with the time impact, and especially that it benefits from the profits made by the Innovation its self, with the collaboration of other functions such as the production and marketing functions, which help commercializing the new Innovation in ways that benefit the firm and its stakeholders, those stakeholders will carry on their innovative activities while its successful and will therefore look for improving their sales number as well as their capacities, through raising their investments, as well as the number of employees and projects; but in our case, for Algerian Firms taken by this study, we found that almost all the firms included in our sample were public owned companies, where employees are logically seem to be numerous, and the most innovative firms in Algeria are big public firms with more than a 1000 employee, including Sonatrach, Soidal, Sonelgaz, and some others; at the same time as the private sector plays a little role on the Algerian innovative activities, either counted by R&D intensity or by the Innovations done within the national market. Nevertheless the national Innovation system of Algeria seem to be limited as we have seen in the third chapter of this work, because the private sector role in this domain is still limited comparing to other developing countries. The main limitation of this study is that we needed to include other companies to our sample, and especially those which do innovate and those which do have R&D departments, because of this fact, we did not get good results as was expected, in the first while, but at least it is a first try for further efforts that we are planning to spend on the field of innovation, in ways that make us able to understand what drives innovation and what slows it down, as well as to find a way to help the local industrial field to be innovative.

Conclusion:

The Innovation activity depends on the absorptive capacity of the firm in creating and acquiring the necessary knowledge that serves not only, at creating inventions but at marketing and launching these Innovations. This creative capacity of the firm stems from its expertise in resolving its internal issues as well as its external productive capability of creating strategic alliances and forging solid partnerships with its suppliers and its buyers.

In this context, many research studies have provided reasons for the success of the Innovation activity by identifying some key factors. These successful factors include the firm's sector of activities, its size and the type of the Innovation.

However, some studies based on the Schumpeterian school argued that the correlation between the firm's capacity to innovate and its market power is yet to be founded; but the most important factor of Innovation is driven by the R&D activity. And this is what we have shown through the international comparison of NISs taking evidence from some obvious researches.

Moreover; there are also the gaps between regions which are getting wider, with large regional inequalities in R&D activities as well. This could be a serious challenge, which is evident in other areas such as human resources, high-technology industries and the openness of regional economies. In the last decade, some advanced countries have launched various strategies designed at energising less developed regions and accelerating union through a combination of regional, financial and S&T policies, and so the African governments including the Algerian one should plan to do the same and especially that these strategies have brought a really massive profit for those countries. Algeria needs also to reward through the international standards of S&T. through launching this study we examine the significance of some main determinants of Innovation and innovativeness such as the R&D and Marketing expenditures and intensity, in addition to the firm's characteristics; then, it helps to investigate how the relationship between Innovation, Marketing expenditures and intensity, R&D expenditures and intensity, and cooperation is moderated by the firms' success and failure in their daily activities.

Several results can be derived from this study, which are of interest to show the Innovation level of Algerian firms. First, the significant estimates in the logistic model recommend that Algerian firms have to extend their efforts in Innovation through raising their R&D activities, and by improving the number and quality of their skilled workers both via adopting short and long-terms training activities as well as by collaborate with other technological organizations. Second, Innovation obstacles must be diminished through implementing a strategy that helps the public-private partnerships. Third, both the government and the national economic actors must find a solution to enhance the foreign direct investment and exports in Algeria, this might help the economy to become more creative and will certainly improve Algerian Firms

competitiveness, through adopting new partnerships and collaboration agreements with foreign economic actors. And especially that foreign direct investment in Algeria is concentrated mainly either in the petroleum and gas sector, or in the low intensive technologies sectors; but we found some executives who have a good sight for the future and who are trying their best making their firms more creative and more innovative in the future through adopting certain strategies which allow employees being creative within their organizations, they are aiming to raise the R&D and Marketing intensity of their firms in order to know how to satisfy their customers, via knowing their desires and expectations, and through inventing new ways and processes by which the final product is made. Despite the fact that our results haven't been significant for the models analysis for several reasons including the sample which was limited, the firms taken by this study were not similar either in field, or innovation types and so on, the results would be interesting for both policy makers and industrial firms in Algeria, and by the way, the findings could be more interesting if the sample included other firms, like that we could make other analyses in ways that help us identifying and knowing the most useful and effective characteristics which may help firms being innovative within the Algerian Market.

General Conclusion:

As seen in this work and mainly in the third chapter, Algerian Firms' levels of innovation are very low, but we have shown that these firms do innovate, so that we have unaccepted our second Hypothesis, which says that Algerian firms do not innovate, and even if these firms do not make radical Innovations but at least they do some efforts to be innovative, we have to notice here that both the economic structure and characteristics of the local market are ones of the most problems facing firms in their ways to be innovative, and even if the government is helping firms in so many ways, but there exist so many problems and obstacles that must be faced and resolved by both governmental and non-governmental organizations, the collaboration of the economic actors is so necessary to enhance the firms' innovativeness and Innovation performance of the local firms in ways that help them being competitive within and outside the local market. Firms also have to be aware of the barriers to Innovation which impede the firms' innovativeness and economic performance, the linkages and cooperation within the firm between Marketing and R&D departments are also so vital for the innovative activities of the firm in order to check out the roles played by marketing to enhance the innovativeness and competitiveness of firms; The requirement of rapid adjustment to dynamic changes reinforces the function of knowledge flow in inter-functional relations. The obligation of integrated knowledge is the most precise in the relations of R&D and marketing, researchers are increasingly aware of its key role in Innovation.

We conclude also, that it is not easy to integrate Marketing departments with other departments, and especially with R&D department during new products development stages, for the reason that there exist so many complicated issues in the process of integration; moreover, the possibility and necessity to connect knowledge elements are influenced by a broad range of external and institutional factors and barriers. Those barriers which may be reduced through several ways, one of them is the role of Governmental and non-governmental organizations, and second, there is the role played by the firms themselves, and especially if they act as a one-unit, through creating linkages and networks between them. Nucleus programmes are a good example of these Networks that may help firms succeeding and strengthening their activities either inside or outside Algeria. We notice here that Innovation will take place only if the result on the market acknowledges the creative idea, thereby, if the products and services developed with novelty are successfully sold, so that Innovation must rely on marketing activities to succeed, and they need to be linked and integrated either before, during or after the development process of the new product, our study shows that in most cases

the integration of marketing and R&D is at much lower level than expected within Algerian Firms. But it shows also that Algerian firms are somehow innovative but their Levels of innovation do not help them being really competitive on the international market, and thereby they have to work collectively as well as individually in order to face the economic challenges and obstacles to improve the economic performance of the whole economy. The potential and capacity of firms for Innovation does not only depend on technological and financial resources. Innovation requires expert know-how in a lot of areas such as management, production, the Innovation process, intellectual property rights, marketing, and cooperation skills and so on. We then have validated the hypothesis which says that Algerian firms are not innovative at all, while we validate the second hypothesis which says that Interdepartmental integration of marketing department with the other departments creates a synergy that helps enhancing and fostering the firm's innovativeness and innovative performance. We have explored links between Innovation and some economic concepts just like firm size, creativity, economic growth, competitiveness and market structure; and have shown how each of these concepts Influences the innovativeness performance of firms as well as the whole economic system in Algeria. As shown in this study Marketing integration with R&D is vital for new products and services success, because commercialization is the only source of revenues and then products and services must be sold after being invented, so we cannot consider Innovation as a success for the firm until it will be sold to generate cash for the firm. And that was empirically approved because we have found a strong correlation between Marketing cooperation, and interdepartmental integration and the firms' innovativeness within the Algerian Market (within the sample, in fact) and then we have accepted the first hypothesis saying that Interdepartmental integration of marketing department with the other departments creates a synergy that helps enhancing and fostering the firm's innovativeness and innovative performance.

Recommendations:

- Innovation has been proven to be crucial element for the economic growth and the development of modern societies, but almost all the developing countries including Algeria are still in a very late place in this field, comparing with other countries; so that both private and public sectors have to gather their efforts in ways that benefit the whole society.
- Despite the fact that people everywhere have a natural ability to be creative, Algeria is not doing enough to stimulate and harness invention and creative thinking, and it tends to stifle innovation and creativity outright; which is in general due to a combination of factors such as: insufficient financial resources, lack of role models, lack of an inspiring education system which values creativity, and social environment which depresses creativity, invention and entrepreneurship.
- Innovation is needed for further developments for our country and it may be possible through finding such a good and well functioning system of innovation, we have to notice here that other countries' experiences in this domain can be taken as examples and as guides but not as a framework; for the reason that several developing countries which have done successful experiences of innovation (such as China, South Korea, and India) but they do not have the same characteristics as Algeria.
- We need to learn from successful case studies of social enterprise and from successful models for stimulating inventions and innovations.
- We need to create the motivations that cultivate creativity on a local level all over the world and to encourage the application of human talents to that end.
- A good financial policy for innovation activities should be established to motivate inventors and innovators either locally or internationally to focus on the local economic development.
- Innovation prizes and awards with large cash sums should be taken as a tool to motivate innovators.
- Local and regional networks of innovators and entrepreneurs should be reinforced and supported all over the country.
- Market and Innovation barriers should be immediately reduced and eventually eliminated.
- The social and political environment should be adopted to sustain innovation and innovators.

- R&D expenditures should be raised by time, and the Private sector must invest more in the domain of R&D.
- Foreign Investors should be attracted to invest within the Algerian market, in ways that develop the local economy.
- An intellectual property framework for the Algerian market should be established in the mid- long-term.

References

1/ Books and Articles:

- ACS, Z.J. and AUDRETSCH D.B. (1990), *"Innovation And Small Firms"*, Cambridge, Mass.: MIT Press.
- ALNAJJAR A. (2002), *"Networking The Arab Scientific Community Can Bring Change To The Arab Countries; Toward Harvesting Outcome Of Arab Education System"*, Arab Science & Technology Foundation (ASTF).
- ALTSHULER, A. and M. ZEGANS. (1990), *"Innovation And Creativity: Comparison Between Public Management And Private Enterprise"*. Cities February: 16–24.
- ANDREW J.P, DEROCOCCO E.S, TAYLOR A. (2009), *"The Innovation Imperative In Manufacturing, How United States Can Resort Its Edge"*. Boston consulting Group, Boston Massachusetts, US.
- AROCENA, R. and J. SUTZ (2003) *"Knowledge, Innovation And Learning: Systems And Policies In The North And In The South"*. In Systems of Innovation and development, 291–310. J. E. Cassiolato & al., eds. Cheltenham Edward Elgar Publishing.
- AUDRETSCH, DAVID B. (2004), *"Sustaining Innovation And Growth: Public Policy Support For Entrepreneurship"*. Industry and Innovation, 11(3): 167;
- BALDWIN, CARLISS Y. (2008) *"Where Do Transactions Come From? Modularity, Transactions And The Boundaries Of Firms,"* Industrial and Corporate Change 17(1):155-195.
- BARRAS, R. (1984). *"Towards A Theory Of Innovation In Services"*. Research Policy 15, Technical Change Centre: 114 Cromwell Road London, U.K, 73.
- BASSANINI, A. and G. DOSI (2000). *"Heterogeneous Agents, Complementarities, And Diffusion. Do Increasing Returns Imply Convergence To International Technological Monopolies?,"* in D. D. GATTI, M. GALLEGATI and A. KIZMON (eds.), *"Market Structure, Aggregation, And Heterogeneity"*. Cambridge, Cambridge University Press.
- BRESCHI, S. and F. MALERBA *"sectoral innovation systems: technological regimes, schumpeterian dynamics, and spatial boundaries"*, 1997.
- BRONWYN H. HALL (2003). *"Innovation And Diffusion "*. University of California at Berkeley, CA. US.(pdf version), pp 3-44.
- CALANTONE, ROGER J, S TAMER Cavusgil, & YUSHAN Zhao. (2002). *"Learning Orientation, Firm Innovation Capability, And Firm Performance"*. Industrial Marketing Management, 31(6): 515.
- CARLISS Y. BALDWIN Eric von Hippel (2009) *"Modeling A Paradigm Shift: From Producer Innovation To User And Open Collaborative Innovation"* Working Paper, Harvard Business School, Boston, MA, US.
- CARLSON, B. (2003) *"internationalization of innovation systems: a survey of the literature"*. SPRU, Paper for the conference in honour of Keith Pavitt: What Do We Know about Innovation? Brighton, U.K.
- CHESBROUGH, (2003) *"open innovation: the new imperative for creating and profiting from technology"*, Boston, MA: Harvard Business School Press,.
- CHRISTENSEN, CLAYTON M, MARK W JOHNSON, & DARRELL K RIGBY. (2002). *"foundations for growth: how to identify and build disruptive new businesses."* MIT Sloan Management Review, 43(3): 22
- COHEN, W.M. and R.C. LEVIN (1989), *"Empirical Studies Of Innovation And Market Structure"*, in R. Schmalensee and R.D. Willig (eds), Handbook of Industrial Organization, Vol. II, Amsterdam: North-Holland.
- COOKE, P. (1996) *"Regional Innovation Systems: An Evolutionary Concept"*. In Regional Innovation systems. H. Baraczyk, P. Cooke, and R. Heidenrieck, eds. London: London University Press.

- COOPER, R. G. and E. J. KLEINSCHMIDT. (1987); *"New Products: What Separates Winners From Losers"*. Journal of Product Innovation Management; pp 169-184.
- CRONIN, MARY. (1996) *"the internet strategy handbook"*. Boston: Harvard business school press.
- DAWES, JOHN; 2000; *"market orientation and company profitability: further evidence incorporating longitudinal data.(statistical data included)"*; Australian Journal of Management. Australia.
- DENG, S. and DART, J. (1994), *"measuring market orientation: a multi-factor, multi-items concept"*, Journal of Marketing Management, No. 10, pp. 725-742.
- DIXON, DONALD F. 2000. *"schumpeter--fifty years later"*. Journal of Macro marketing, 20(1): 82).
- DRUCKER, P. F. & J. A. MACIARIELLO. (2008). *"management"*: revised edition. NY: Harper Collins. p 30. Noticed in "JOSEPH MACIARIELLO, (2008) *"Marketing And Innovation In The Drucker Management System"*, Journal of the Academy of Marketing Science; CA, USA."
- EDQUIST, C., L. HOMMEN, and M. Mckelvey, (2001). *"innovation and employment, process versus product innovation"*, Cheltenham: Elgar
- ELROD, TERRY and MICHAEL P. KEANE (1995), *"a factor-analytic probit model for representing the market structure in panel data,"* Journal of Marketing Research, 32, 1-16.
- ERDIL S., Erdil o. And Keskin h. *"the relationships between market orientation, firm innovativeness and innovation performance"*, Journal of Global Business and Technology.
- FAGERBERG J.GODINHO .M.M., (2003). *"innovation and catching-up, the handbook of innovation"*, chapter 20, draft 4.
- FAGERBERG, JAN. (2003) *"schumpeter and the revival of evolutionary economics: an appraisal of the literature"*, Journal of Evolutionary Economics, forthcoming.
- FAGERBERG, JAN. (2004). *"innovation: a guide to the literature"*. centre for technology, innovation and culture, University of Oslo, pdf file. 4.
- FAGERBERG, JAN. (2004). *"innovation: a guide to the literature"*. in FAGERBERG, JAN, DAVID C. MOWERY and RICHARD R. NELSON. The Oxford Handbook of Innovations. Oxford University Press. pp. 1-26.
- FREEMAN, C. (1995), *"the national system of innovation in historical perspective"*, Cambridge Journal of Economic. UK.
- GORDON, R. J. (2003). *"five puzzles in the behavior of productivity, investment, and innovation,"* in Global Competitiveness Report, 2003-2004, World Economic Forum.
- GRANT, ROBERT M. (2003). *"cases in contemporary strategy analysis. usa, uk, australia, germany"* blackwell publishing", Cited in www.wikipedia.com
- GRBAC Martin, J.H., , B., (2003) *"Using Supply Chain Management To Leverage A Firm's Market Orientation"*, Industrial Marketing Management, Vol. 32: 25-38.
- GRIFFIN, A. and J, R. HAUSER. (1996); *"integrating R&D and marketing: a review and analysis of the literature"*. Journal of Product Innovation Management; pp 191-215.
- HALL Bronwyn H. (2003) *"Innovation And Diffusion"* Hall on Diffusion, US. from http://elsa.berkeley.edu/~bhhall/papers/Diffusion_Ch18_BHHfinal.pdf.
- HAMEL G. (2000), *"leading the revolution"*, Harvard Business School Press,.
- HAMEL, Gary & Gary GETZ. (2004). *"Funding Growth In An Age Of Austerity"*. Harvard Business Review, 82(7, 8): 76;
- JOHNSON B, EDQUIST C and Lundvall B (2003). *"Economic Development And The National System Of Innovation Concept"*.
- KAHN b. Kenneth; (1996) *"Interdepartmental Integration: A Definition With Implications For Product Development Performance"*; The Journal Of Product Innovation Management, Elsevier Science Inc, NY; US.
- KAHN, K. (1996); *"Interdepartmental Integration: A Definition With Implications For Product Development Performance"*. Journal of Product Innovation Management; pp 137-151.

- KAHN, K. and J. T. MENTZER, (1998); *“Marketing’s Integration With Other Departments”*; Journal of Business Research; 42(1); pp 53-62.
- KYRIAZIS E. (2005); « *The Effectiveness Of The R&D/Marketing Working Relationship During Npd Projects* », ANZMAC Conference: Entrepreneurship, Innovation and New Product Development.
- LADO N. and A. MAYDEU-OLIVARES , (2001) *“Exploring The Link Between Market Orientation And Innovation In The European And Us Insurance Markets”*; International Marketing Review, Vol. 18 No. 2, 2001, pp. 130-144.
- LAGER, T. (2000) *“A New Conceptual Model For The Development Of Process Technology In Process Industry”*. International Journal of Innovation Management, 320–345.
- LAGER. T. (2002) *“A Structural Analysis Of Process Development In Process Industry”*. R&D Management, 32, 1, 87–95.
- LEVITT Theodore. 2002. *“Creativity Is Not Enough”*. Harvard Business Review 80 (8) 137-144.
- LISA P. L. LIM, Elizabeth GARNSEY and Mike GREGORY (2006). *“Product And Process Innovation In Biopharmaceuticals: A New Perspective On Development”*, Institute for Manufacturing, University of Cambridge, UK, Published by Blackwell Publishing Ltd. Oxford, UK. pp 27-31.
- Luecke, Richard; Ralph Katz (2003). *“Managing Creativity And Innovation”*. Boston, MA: Harvard Business School Press. ISBN 1-59139-112-1; Cited in www.wikipedia.com. October 2009
- LUNDVALL, B.-A., B. JOHNSON, E.-S. Andersen, and B. Dalum (2002) *“National Systems Of Production, Innovation And Competence Building”*. Research Policy 31, 213–23.
- MACIARIELLO Joseph, (2008) *“Marketing And Innovation In The Drucker Management System”*, Journal of the Academy of Marketing Science; CA, USA.
- MAGRETTA J., (2002) *‘Why Business Models Matter’*, Harvard Business Review, vol. 80, no. 5, pp. 86–92
- MASSEY G. R. and E. KYRIAZIS; (2006); *“Communication And Conflict Between Marketing And R&D During New Product Development Projects”*; published for the conference of the Australian and New Zealand Marketing Academy.
- MENON, A., BHARAWADJ, S. G. and HOWELL, R. (1996); *“The Quality And Effectiveness Of Marketing Strategy: Effects Of Functional And Dysfunctional Conflict In Intraorganizational Relationships”*; Journal of the Academy of Marketing Science. 24(4); pp 299-313.
- METCALFE, J. S. (1998) *“Evolutionary Economics And Creative Destruction”*, London: Routledge
- MOENAERT, R.K., W.E. SOUDER, A. De Meyer, and D. Deschoolmeester, (1994); *“R&D Marketing Integration Mechanisms, Communication Flows, And Innovativeness”*. Journal of Product Innovation Management, 11, 1, 31-45.
- MOENAERT, Rudy K., SOUDER, William E., DEMEYER, Arnoud, and DESCHOOLMEESTER, Dirk, (1994): *“R&D-Marketing Integration Mechanisms, Communication Flows, And Innovation Success”* Journal of Product Innovation Management 11; 31–45.
- MOORE, M. H., M. SPARROW, and W. SPELMAN. (1997). *“Innovation In Policing: From Production Lines To Jobs Shops. In “Innovation In American Government: Challenges, Opportunities, And Dilemmas”*, eds. Alan A. Altshuler and Robert D. Behn, 274–98. Washington, DC: Brookings Institute Press.
- NELSON, R. R. (1993); *“National Innovation Systems: A Comparative Analysis”*. New York: Oxford University Press.
- NELSON, R. R., A. PETERHANSL, and B. N. SAMPAT (2002). *“Why And How Innovations Get Adopted: A Tale Of Four Models.”* New York: Columbia University. US.
- NELSON, R.R. and S.G. WINTER (1982) *“An Evolutionary Theory Of Economic Change”*, Cambridge, Massachusetts: Harvard University Press.
- NEVERS, M., G. SUMME, and B. UTTEL, *“Commercializing Technology: What The Best Companies Do,”* Harvard Business Review, Vol. 68, Issue 3, May/June 1990, pp. 154–164.

- NONAKA, I. and H. TAKEUCHI (1995); *"The Knowledge Creating Company"*, Oxford: Oxford University
- NUTLEY S, DAVIES H, WALTER I (2002), *"Learning From The Diffusion Of Innovations-Conceptual Synthesis"* Research Unit for Research Utilisation Department of Management University of St Andrews St Katharine's West. London, pp 14-29.
- OLSON, Eric M., WALKER, ORVILLE C., Jr., and RUEKERT, Robert W. (January 1995); *"Organizing For Effective Product Development: The Moderating Role Of Product Innovativeness"*; Journal of Marketing 59: 48-62.
- P. TROTT, (2005) *"Innovation Management and New Product Development"*, 3rd edition, FT/Prentice Hall.
- PALMER Adrian (2005), *"Principles of Services Marketing"*; 4th edition, London.p 263.
- PATEL, P. and k. PAVITT (1994), *"The Nature and Economic Importance Of National Innovation Systems"*, STI Review, No. 14, OECD, Paris.
- PATEL. P. and K. PAVITT (1992), *"The Innovative Performance Of The World's Largest Firms: Some New Evidence"*, Economics of Innovation and New Technology, 2, pp. 91-102.
- PAVITT, K., M. ROBSON and J. TOWNSEND (1987), *"The Size Distribution Of Innovating Firms In The Uk: 1945-1983"*, Journal of Industrial Economics, 35, pp. 297-316.
- Petruska Ildiko; (2004), *"R&D-Marketing Integration In The New Product Development Process"* periodica polytechnica ser. Soc man.
- PING Lan, (unknown year of publication) *"On The Design Of A Seven-Stage Innovation Life Cycle"* University of Alaska Fairbanks, US.
- PISANO, G. (1997) *"The Development Factory"*. Harvard Business School Press. Boston, MA US.
- PORTER, Michael E. and STERN, Scott. (2001) *"Innovation: Location Matters."* MIT Sloan Management Review 42 (4), 28-36.
- ROGERS, E. M. (1995). *"Diffusion Of Innovations"* 4th.ed., New York: The Free Press
- ROTHWELL, Roy,(1994),*"Towards The Fifth-Generation Innovation Process"*, International Marketing Review,Vol.11,No 1,1994,pp.7-31.
- RUCK Hans, Marcus MENDE, (2009), *"Innovations In Market Segmentation And Customer Data Analysis"*, Innovation journal, US.
- SCHUMPETER, J. (1934); *"The Theory Of Economic Development"*, Cambridge, Mass: Harvard University Cited in www.wikipedia.com, june 2008.
- SCHUMPETER, J. A. (1942). *"Capitalism, Socialism And Democracy"*. New York: Harper and Row. Cited in www.wikipedia.com, june 2008.
- SLATER SF, JC NARVER; (1995); *"Market Orientation And The Learning Organization"*. Journal of Marketing; 59: 63-74.
- SLATER, S.F., NARVER, J.C. (2000), *"Market Oriented Is More Than Being Customer-Led"*, Strategic Management Journal, Vol: 20.
- SUTTON, Robert I., 2001. *"Weird Ideas That Work"*, 11 ½ Practices for Promoting, Managing and Sustaining Innovation. New York, NY. Free Press.
- SYMEONIDIS G., (1996b) *"innovation, firm size and market structure: schumpeterian hypotheses and some new themes"* OECD Economic Studies No . 27. 1996/11, Paris, France.
- TIDD, J. (2006) *"From Knowledge Management To Strategic Competence: Measuring Technological, Market And Organizational Innovation"*, Imperial College Press.
- TIDD, J., BESSANT, J. and PAVITT, K. (2005); *"Managing Innovation: Integrating Technological, Market And Organizational Change"*, Third edition, Wiley.
- TUOMI, Ilkka (2002). *"Networks Of Innovation"*. Oxford University Press. ISBN 978-0-19-925698-3.
- ULRICH, K. and EPPINGER, S.D. (2000). *"Product Design And Development"*. New York; US: McGraw-Hill.
- URBAN, Glen L., and HAUSER, John R. (1993): *"Design And Marketing Of New Products"*, 2nd edition., Prentice Hall, Englewood Cliffs, NJ.

- URMAS Varblane, David DYKER, and Dorel TAMM (2007), *“How To Improve The National Innovation Systems Of Catching-Up Economies?”*, the EU 6th framework project CIT5-CT-028519, Estonia.
- UTTERBACK, J.M. (1994) *“Mastering The Dynamics Of Innovation”*. Boston,MA: Harvard Business School Press.
- UZUNIDIS D. (2009), *“Innovation, Growth And Sustainable Development: General Presentation”*, Journal of Innovation Economics /1, N° 3, p. 5-11.
- VAN DE VEN, A. H., and D. L. FERRY, (1980); *“Measuring And Assessing Organizations”* John Wiley and Sons. New York; US.
- VAN DE VEN, A., D.E.Polley, R. Garud and S. Venkataraman (1999); *“THE INNOVATION JOURNEY”*, New York: Oxford University Press, Cited in www.wikipedia.com. July 2009.
- VON HIPPEL Eric (1988). *“The Sources Of Innovation”*. Oxford University Press. ISBN 0-19-504085-6. p 102-115.
- WENDT, O., and F. WESTARP von (2000). *“Determinants Of Diffusion In Network Effect Markets.”* Paper presented at the 2000 IRMA International Conference, Anchorage, Alaska.
- WIND, Yoram(1981); *“Marketing And The Other Business Functions”*, Research in Marketing 5, 237-264.

2/ Reports:

- OECD (1996), Science, Technology and Industry Outlook, Paris.
- OECD (2002) Dynamising National Innovation Systems. OECD Publications, Paris.
- OECD, (1997b), National Innovation Systems, OECD Publications, Paris.
- OECD, (2009), "National Innovation systems", OECD Publication, Paris.
- OECD, National Innovation systems, OECD Publication, Paris, unknown year of publication.
- UNESCO Institute for Statistics (UIS) International data collection and uses of international data: Overview of data for Africa, Seminar – Workshop on Science, Technology and Innovation Indicators Gaborone, Botswana, 22-25 Sept 2008.
- UNESCO Institute for Statistics (UIS) Science & Technology Database, 2007 ; www.uis.unesco.org

3/ Web Sites:

- <http://www.1000ventures.com>
- <http://www.accessmylibrary.com>
- <http://www.INAPI.dz> ; Institut national algérien de la propriété industrielle (INAPI)
- <http://www.marketingteacher.com>
- <http://www.tcw.utwente.nl>
- <http://www.uis.unesco.org>; UNESCO Institute for Statistics
- <http://www.wikipedia.com>,
- <http://www.ygourven2.free.fr/>
- www.wipo.int; World Intellectual Property Organization

Appendix:

Table 27: TABLE des Réalisations du 1er Janvier au 30 Septembre 2006:

Opérations	Réalisations 2005	Prévisions annuelles 2006	Réalisations au 30/09/06	Taux de réalisations au 30/09/06
Demandes de brevets d'invention	514	425	477	112%
Demandes nationales de marques	2438	2300	2682	116%
Demandes nationales de renouvellements de marques	931	800	615	77%
Demandes internationales étendues à l'Algérie	3665	3300	2875	87%
Demandes nationales de dessins et modèles	276	200	273	136%
Demandes d'appellations d'origine	06	0	3	/
Recherche d'antériorités de marques	3741	3100	3517	113%
Recherches d'antériorités de brevets	155	50	137	274%
Inscriptions aux registres des marques, dessins et modèles	1800	1800	1405	78%
Inscriptions aux registres des brevets	68	30	31	103%
Publications du BOPI	03	21	08	38%
Total	13.374	12.026	12.023	99%

Source: l'INAPI (Institut National Algérien de la Propriété Industrielle), March 2010.

Table 28: Les détails des différentes opérations:

Opérations	Année 2005			Année 2006		
	Prévision annuelle	Réalisations 30/06/05	Taux de réalisation	Prévision annuelle	Réalisations 30/09/06	Taux de réalisation
Réception de dépôts nationaux de marques modèles et appellations d'origine	2000	1364	68%	2500	2958	118 %
Renouvellement	600	379	63 %	800	615	77 %
Enregistrements nationaux de marques, modèles et appellations d'origine	2000	868	43 %	5000	1232	25 %
Enregistrements internationaux étendus à l'Algérie	3300	1235	37 %	3300	2875	87 %
Recherche d'antériorités	3100	2005	65 %	3100	3517	113 %
Inscriptions aux registres des marques, dessins et modèles	1800	770	42 %	1800	1405	78 %
Publications du BOPI	18	3	16 %	21	8	38 %
Total	12818	6624	52 %	16521	12610	76,5%

Source: l'INAPI (Institut National Algérien de la Propriété Industrielle), March 2010.

Table 29 : Evolution des dépôts nationaux de marques par année:

Année	Trimestre 1	Trimestre 2	Trimestre 3	Annuellement au 31/12
1980	216	419	311	961
1981	191	412	124	753
1982	262	750	293	1295
1983	189	481	174	894
1984	275	516	156	852
1985	289	555	244	1121
1986	481	857	716	2087
1987	410	726	223	1222
1988	244	455	250	959
1989	248	496	353	1175
1990	243	508	259	1080
1991	225	677	218	1175
1992	317	930	258	1564
1993	296	668	305	1329
1994	318	667	280	1251
1995	336	706	475	1678
1996	522	1022	524	2110
1997	393	894	377	1650
1998	347	792	459	1744
1999	389	888	480	1968
2000	545	1139	507	2254
2001	671	1349	529	2462
2002	705	1477	475	2592
2003	496	1288	547	2416
2004	482	1060	508	2048
2005	510	1217	592	2438
2006	891	1771	911	---

Source: l'INAPI (Institut National Algérien de la Propriété Industrielle), March 2010.

Table 30: Marques internationales étendues à l'Algérie au cours de l'année 2006 (du 01/01 au 31/12/06):

Origine	Enregistrements	Renouvellements	Extensions	Total
France	559	752	113	1424
Allemagne	338	567	62	967
Italie	254	360	57	671
Suisse	198	295	65	558
Chine	193	13	11	217
Espagne	103	123	24	250
Belgique	63	72	05	140
Maroc	54	11	01	66
Pays bas	53	92	15	160
Autriche	34	28	04	66

Portugal	24	04	01	29
Luxembourg	19	18	03	40
Slovénie	19	03	/	22
F. Russie	18	05	/	23
Pologne	17	41	06	64
Egypte	15	/	/	15
Croatie	12	03	05	20
Liechtenstein	12	03	01	16
Bulgarie	11	/	03	14
Viêtnam	07	/	/	07
Iran	05	/	02	07
Roumanie	05	04	/	09
Kazakhstan	04	03	/	07
Kenya	04	/	/	04
Tchèque	04	14	01	19
Hongrie	03	16	02	21
Serbie Monténégro	03	07	/	10
Japon	02	/	/	02
Azerbaïdjan	01	/	/	01
Cuba	01	/	/	01
Etat Unis d'Amérique	01	/	/	01
R. Moldova	01	/	/	01
Monaco	01	04	02	07
Slovaquie	01	01	07	09
Syrie	01	01	/	02
Yougoslavie	01	/	/	01
Chypre	/	/	01	01
Lettonie	/	/	01	01
Royaume Uni	/	05	/	05
Total	2040	2446	392	4878

Source: l'INAPI (Institut National Algérien de la Propriété Industrielle), March 2010.

Table 31 : Dépôts des modèles déposés du 01/01/06 au 31/12/06:

Origine	Nombre de dépôt	Nombre d'objet
Algérie	277	719
Allemagne	4	4
Bahamas	1	1
Brésil	2	43
Chine	4	14
Corée	5	35
Espagne	5	26
Etat Unis d'Amérique	1	4
France	14	25

Italie	1	25
Inde	4	28
Liechtenstein	1	3
Pays bas	4	36
Portugal	2	9
Royaume Uni	1	14
Sudan	1	1
Turquie	1	1
Total	328	988

Source: l'INAPI (Institut National Algérien de la Propriété Industrielle), March 2010.

Table 32: Enregistrements des modèles accordés au cours de l'année 2006:

Origine	Nombre de dépôt	Nombre d'objet
Algérie	170	310
Bahamas	1	1
Belgique	1	1
Brésil	2	43
Espagne	1	6
France	6	13
Italie	11	89
Japon	7	44
Pays bas	2	20
Royaume Uni	1	7
Suisse	5	11
Turquie	1	5
Total	208	551

*** Au 31 décembre 2006, 1883 modèles portant sur 3963 objets sont en vigueur***

Source: l'INAPI (Institut National Algérien de la Propriété Industrielle), March 2010.

Table 33: Etat des recherches de 2000 à 2006:

Années	Recherches marques
2000	3052
2001	3173
2002	4251
2003	2769
2004	3715
2005	3741
2006	4401
Total	25102

Source: l'INAPI (Institut National Algérien de la Propriété Industrielle), March 2010.

Table 34: Etat comparatif 2005/2006 des réalisations par opération:

Opérations	Année 2005			Année 2006		
	Prévisions annuelles 2005	Réalisations au 31/12/05	Taux de réalisation 2005	Prévisions annuelles 2006	Réalisations au 31/12/06	Taux de réalisation 2006
Réception de dépôts nationaux de marques modèles et appellations d'origine	2 000	2 725	136%	2 500	3 982	159%
Renouvellement	600	931	155%	800	748	93,5%
Enregistrements nationaux de marques, modèles et appellations d'origines	2 000	854	42%	5 000	2 018	41%
Enregistrements internationaux étendus à l'Algérie	3 300	3 665	111%	3 300	4 878	148%
Recherche d'antériorités	3 100	3 741	120%	3 100	3 741	121%
Inscriptions au registre des marques, dessins et modèles	1 800	1 977	114%	1 800	6 238	346%
Publication du BOPI	18	03	16%	21	19	76%
Total	12 818	13 896	108%	16 521	21 624	130%

Source: l'INAPI (Institut National Algérien de la Propriété Industrielle), March 2010.

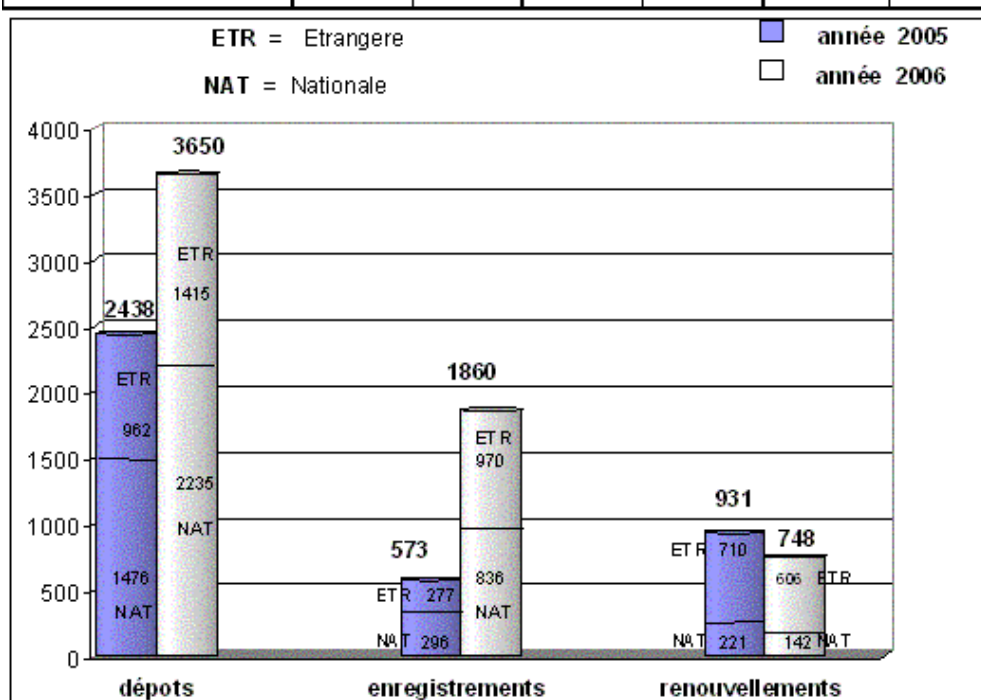
Table 35: Etat des réalisations par opération:

Opérations	Prévisions annuelles 2006	Réalisations au 31/12/06	Taux de réalisation 2006
Réception de dépôt national de marques modèles et appellations d'origine	2 500	3 982	159%
Renouvellement	800	748	93,5%
Enregistrements nationaux de marques, modèles et appellations d'origines	5 000	2 018	41%
Enregistrements internationaux étendus à l'Algérie	3 300	4 878	148%
Recherche d'antériorités	3 100	3 741	121%
Inscriptions au registre des marques, dessins et modèles	1 800	6 238	346%
Publication du BOPI	21	19	76%
Total	16 521	21 624	130%

Source: l'INAPI (Institut National Algérien de la Propriété Industrielle), March 2010.

**Etat comparatif des dépôts, enregistrements et renouvellements
des marques nationales année 2005 - 2006**

Pays origine	dépôts		enregistrements		renouvellements	
	2005	2006	2005	2006	2005	2006
nationale	1476	2235	296	970	221	142
étrangère	962	1415	277	836	710	606
total	2438	3650	573	1806	931	748



Source: l'INAPI (Institut National Algérien de la Propriété Industrielle), March 2010.

Table 36: Statistiques concernant les Marques de Produits et de Services au 31/12/2006

Année	MARQUES DEPOSEES EN ALGERIE			MARQUES DEPOSEES INTERNATIONALEMENT AVEC EXTENSION L'ALGERIE	TOTAL
	D'origines nationales	D'origines étrangères	S/Total		
1966	/	15 215	15 215	/	15 215
1967	245	1 236	1 481	/	1 481
1968	207	913	1 120	/	1 120
1969	234	928	1 162	/	1 162
1970	323	839	1 162	/	1 162
1971	236	727	963	/	963
1972	77	1 543	1 620	3 764	5 384
1973	108	645	753	4 968	5 721
1974	122	797	919	4 542	5 461

1975	132	1 124	1 256	4 686	5 942
1976	124	2 504	2 628	4 133	6 761
1977	144	1 166	1 310	3 549	4 859
1978	99	792	891	3 012	3 903
1979	133	775	908	3 033	3 941
1980	313	648	961	3 221	4 182
1981	107	646	753	3 227	3 980
1982	160	1 134	1 294	3 352	4 646
1983	294	599	893	2 742	3 635
1984	174	678	852	2 922	3 774
1985	236	885	1 121	2 787	3 908
1986	543	1 544	2 087	3 028	5 115
1987	375	846	1 221	2 578	3 799
1988	290	668	958	2887	3 845
1989	477	694	1 171	3 118	4 289
1990	461	619	1 080	3 226	4 306
1991	480	695	1 175	3 120	4 295
1992	460	1 101	1 561	3 685	5 246
1993	667	662	1 329	4 228	5 557
1994	518	733	1 251	3 956	5 207
1995	662	1 016	1 678	3 474	5 152
1996	691	1 419	2 110	3 501	5 611
1997	559	1 091	1 650	3 575	5 225
1998	765	979	1 744	3 832	5 576
1999	945	1 023	1 968	3 480	5 448
2000	1 237	1 017	2 254	3 802	6 056
2001	1 418	1 107	2 525	3 526	6 051
2002	1 333	1 258	2 591	3 040	5 631
2003	1 488	920	2 408	3 133	5 541
2004	1 266	1 308	2 574	3 252	5 826
2005	1 676	1 693	3 369	3 665	7 034
2006	2 477	1 921	4 398	4 878	9276
Total	22 256	56 108	78 364	122 922	201 286

Source: l'INAPI (Institut National Algérien de la Propriété Industrielle), March 2010.

Questionnaire: (Done by the Author)

N.B : Les informations recueillies seront utilisées seulement pour un traitement statistique dans le cadre d'un travail académique universitaire.

Identification de l'entreprise :

Nom de l'entreprise	
Date de création	
Nature de Propriété	privée, publique, privé-public
Secteur d'activité principal	
Secteur d'activité secondaire	
Nombre d'employés	

1. Existe-t-il un département Marketing dans votre entreprise ?

- 1. Oui
- 2. Non

2. Existe-t-il un département de Recherche et Développement (R&D) dans votre entreprise?

- 1. Oui
- 2. Non

3. Quel est le nombre d'employés qualifiés dans votre entreprise ? (Managers, et personnel qualifié dans le domaine de l'administration, la technologie, et la R&D) ?

.....

4. Combien de produits avez-vous déjà crée pour le marché Algérien?

- 1. Biens
- 2. Services

5. Avez-vous créé des nouveaux processus de production au sein de votre entreprise?

- 1. Oui
- 2. Non

6. Détenez-vous des droits de propriété sur vos Innovations?

- 1. Oui
- 2. Non

6.1. Si OUI, Les quelles ?

.....
.....
.....

et Combien de brevés et/ou licences avez-vous ?

.....

7. De la liste suivante quels sont les problèmes les plus importants que vous affrontez dans la création de nouveaux produits? (3 Réponses Maximum)

1. <input type="checkbox"/> Financiers	9. <input type="checkbox"/> La concurrence
2. <input type="checkbox"/> Organizationnels	10. <input type="checkbox"/> dans la communication
3. <input type="checkbox"/> Marketing	11. <input type="checkbox"/> dans la distribution
4. <input type="checkbox"/> manque de compétences	12. <input type="checkbox"/> Manque d'appuis institutionnel
5. <input type="checkbox"/> Production ou Technique	13. <input type="checkbox"/> Obtenir des droits de propriété
6. <input type="checkbox"/> Compétition étrangère	14. <input type="checkbox"/> Taxes
7. <input type="checkbox"/> sécurité	15. <input type="checkbox"/> la politique industrielle du pays
8. <input type="checkbox"/> Manque d'infrastructure	16. <input type="checkbox"/> Autre (préciser).....

8. Les employés dans votre entreprise poursuivent-ils des activités ou des formations de perfectionnement en rapport avec vos besoins?

1. Oui
2. Non

8.1. Si OUI ; Donner des exemples de ces formations :

.....
.....

9. Quelles sont les barrières de votre entreprise pour être innovante sur le marché? (5 Réponses Maximum)

1. <input type="checkbox"/> Juridiques	6. <input type="checkbox"/> La valeur du nouveau produit n'est pas claire pour les clients
2. <input type="checkbox"/> Accès au marché	7. <input type="checkbox"/> Les clients ne veulent pas prendre un risque de consommer le nouveau produit
3. <input type="checkbox"/> L'Image de marque	8. <input type="checkbox"/> Compatibilité du nouveau produit
4. <input type="checkbox"/> Accès au financement	9. <input type="checkbox"/> Traditionnels et/ou culturels
5. <input type="checkbox"/> Développement du produit	10. <input type="checkbox"/> Religieux
11. Autres : (préciser).....	

10. Par rapport à votre chiffre d'affaire; quel est le pourcentage que vous consacrez pour:

1. l'activité Marketing: %
2. l'activité de Recherche et développement: %
3. la Qualité et l'amélioration de vos produits: %
4. les formations de vos employés : %

11. avez-vous des partenaires techniques qui vous aident dans vos projets ?

1. Oui
 2. Non

11.1. Si Oui, combien de partenaires avez-vous ?

.....

et de quelle nationalité :

.....

12. Par rapport à votre chiffre d'affaire; le pourcentage que vous consacrez pour l'activité Marketing ressemble :

1. Bas
 2. Très bas
 3. Moyen
 4. Haut
 5. Très haut

13. Dans le tableau suivant, donner votre opinion pour chaque phrase (avec des notes de 1 jusqu'à 5.

Dont 1=totalement pas vrais et 5=totalement vrais)

Processus :

1.	Nous n'avons pas un processus qui nous aide à gérer efficacement le développement de nouveaux produits	
2.	Nos projets d'Innovation ne sont pas achevés à temps et dans les limites du budget	
3.	L'ensemble de nos départements comprend les besoins de la clientèle et pas seulement le département marketing	
4.	Nous recherchons systématiquement des idées de nouveaux produits	
5.	Notre système de développement de produits est suffisamment flexible pour permettre l'émergence de nos projets	

Organization :

1.	Les employés peuvent proposer des idées concernant l'amélioration des produits ou des processus	
2.	Notre structure d'organisation nous aide à prendre rapidement des décisions	
3.	Notre communication interne est efficace	
4.	Notre structure et systèmes internes soutiennent et facilitent l'Innovation	
5.	Nous travaillons efficacement en équipe	

Marketing :

1.	Le département Marketing est un facteur clef du succès de nos produits	
2.	Le département Marketing est co-intégré totalement avec les autres départements	
3.	Nous basons la création de nos produits sur la satisfaction des besoins de nos clients	
4.	Nous savons bien comment gérer la relation avec nos clients	
5.	Nous avons une bonne réputation dans le marché.	

Collaboration et liens :

Nous collaborons efficacement avec

1.	Les universités, les centres de recherche	
2.	Nos clients dans la conception de nos produits	

3.	D'autres entreprises pour développer de nouveaux produits ou processus	
4.	Les réseaux locaux et nationaux d'enseignement et des experts afin de communiquer nos besoins en compétences	
5.	Nous avons une stratégie basée sur la formation et l'émulation du personnel.	

14. Dans votre opinion, les barrières d'Innovation sont beaucoup et sont très forts en Algérie.

	Totalement faux
	Partiellement Faux
	Je n'ai pas d'opinion
	Partiellement Vrais
	Totalement Vrais

15. Dans l'échelle suivante, où se situe votre chiffre d'affaire de l'année passée:

1. Moins de 2 millions de DA.
2. Entre 2 et 20 millions de DA.
3. Entre 20 millions et 200 millions de DA.
4. Entre 200 millions et 2 milliards de DA.
5. Plus de 2 milliards de DA.

16. Quel est votre chiffre d'affaire le plus faible durant les cinq (5) dernières années ?

DA

17. Quel est votre chiffre d'affaire le plus Haut durant les cinq (5) dernières années ?

DA

18. Par rapport à votre chiffre d'affaire; les dépenses que vous consacrez pour l'activité Marketing sont:

	Très faibles
	Faibles
	Moyennes
	Elevées
	Très élevées

19. Par rapport à votre chiffre d'affaire; les dépenses que vous consacrez pour l'amélioration de vos produits et services sont:

	Très faibles
	Faibles
	Moyennes
	Elevées
	Très élevées

20. Par rapport à votre chiffre d'affaire; les dépenses que vous consacrez pour l'activité R&D (si vous disposez d'un département R&D au sein de votre entreprise) sont:

	Très faibles
	Faibles
	Moyennes

	Elevées
	Très élevées

21. Quels sont les avantages concurrentiels les plus importants de votre entreprise ?

1. <input type="checkbox"/> Aucun	6. <input type="checkbox"/> Bon service après vente	10. <input type="checkbox"/> Une meilleure situation financière
2. <input type="checkbox"/> Prix bas	7. <input type="checkbox"/> Bonne réputation	11. <input type="checkbox"/> Marketing plus efficace
3. <input type="checkbox"/> Bonne qualité de produit	8. <input type="checkbox"/> Bonnes relations avec les clients	12. <input type="checkbox"/> Fournisseurs fiables
4. <input type="checkbox"/> Bonne location	9. <input type="checkbox"/> Plus de produits diversifiés	13. <input type="checkbox"/> Meilleur réseau de distribution
5. <input type="checkbox"/> Bonne communication	Autre :	

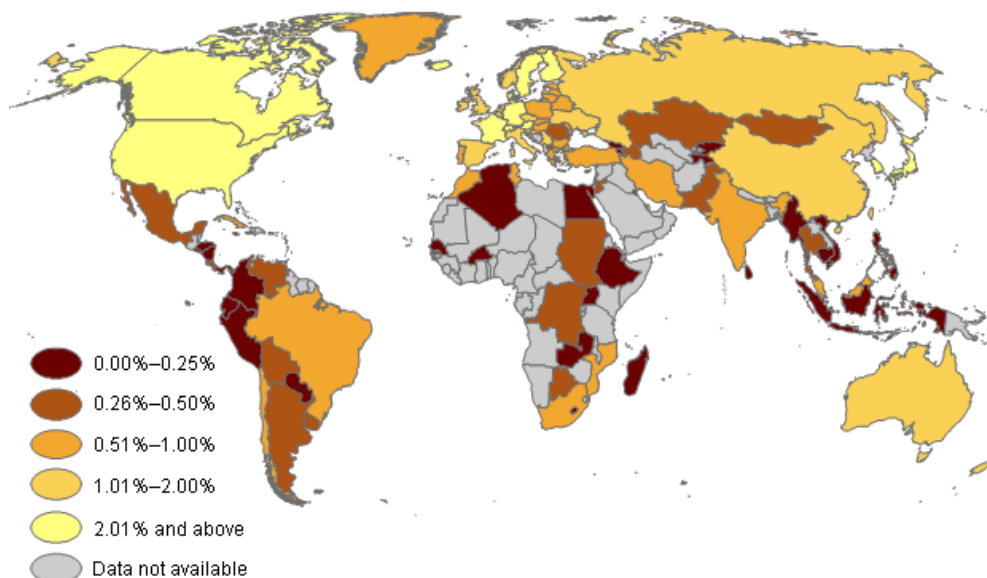
22. Quels sont les objectifs fixés pour les années futures les plus importants pour votre entreprise?

.....
.....
.....

23. Quels sont les investissements prévus?

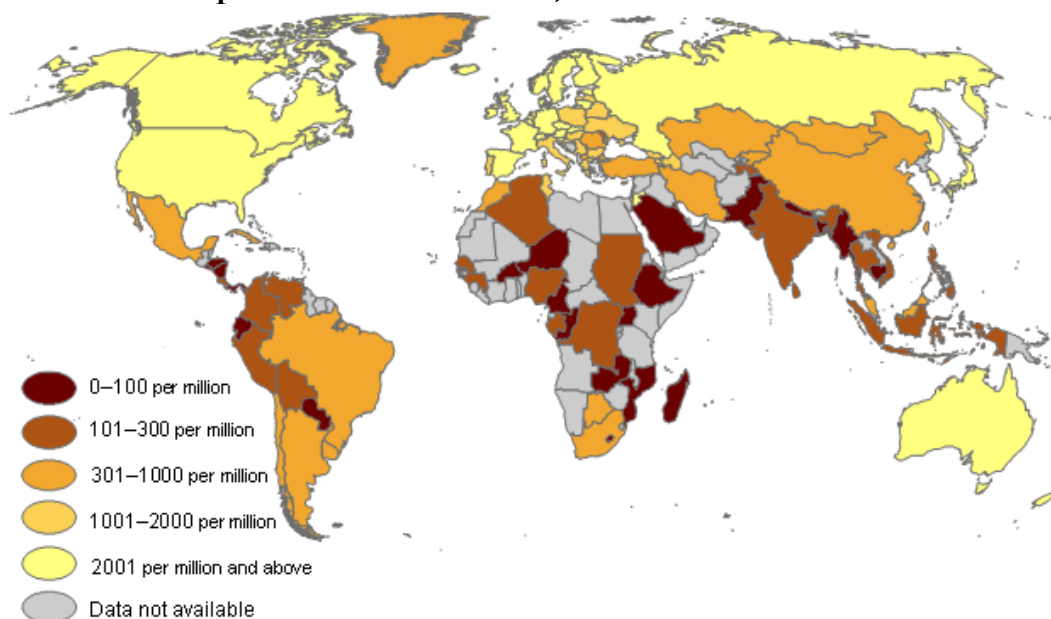
.....
.....
.....

Chart 1: Gross domestic expenditure on R&D (GERD) as a percentage of GDP, 2005 or latest available data.



Source: UIS S&T Database, 2007 ; www.uis.unesco.org¹

Chart 2: Researchers per million inhabitants, 2005 or latest available data



Source: UIS S&T Database, 2007 ; www.uis.unesco.org²

Table 37: Correlations between the firms' innovativeness and the size of these firms.

		Size	INNO
Size	Pearson Correlation	1	,00522(**)
	Sig. (2-tailed)	.	,000
	N	55	55
INNO	Pearson Correlation	,522(**)	1
	Sig. (2-tailed)	,000	.
	N	55	56

Source : the Author

¹ UNESCO Institute for Statistics (UIS) International data collection and uses of international data: Overview of data for Africa, Seminar – Workshop on Science, Technology and Innovation Indicators Gaborone, Botswana, 22-25 Sept 2008.

² UNESCO Institute for Statistics (UIS) Science & Technology Database, 2007 ; www.uis.unesco.org

Table 38: Correlations between the firms' innovativeness and the existence of marketing departments within these firms.

		INNO	MKG
INNO	Pearson Correlation	1	,476(**)
	Sig. (2-tailed)	.	,000
	N	56	56
MKG	Pearson Correlation	,476(**)	1
	Sig. (2-tailed)	,000	.
	N	56	56

Source : the Author

Table 39: Correlations between the firms' innovativeness and the existence of R&D department within these firms.

		INNO	RD
INNO	Pearson Correlation	1	,434(**)
	Sig. (2-tailed)	.	,001
	N	56	56
RD	Pearson Correlation	,434(**)	1
	Sig. (2-tailed)	,001	.
	N	56	56

Source : the Author

Table 40: Correlations between the firms' innovativeness and the employees training cycles outside their firms.

		INNO	EMPT
INNO	Pearson Correlation	1	,527(**)
	Sig. (2-tailed)	.	,000
	N	56	56
EMPT	Pearson Correlation	,527(**)	1
	Sig. (2-tailed)	,000	.
	N	56	56

Source : the Author

Table 41: Correlations between the firms' innovativeness and the Marketing Intensity of these firms.

		INNO	MKGI
INNO	Pearson Correlation	1	,446(**)
	Sig. (2-tailed)	.	,001
	N	56	56
MKGI	Pearson Correlation	,446(**)	1
	Sig. (2-tailed)	,001	.
	N	56	56

Source : the Author

Table 42: Correlations between the firms' innovativeness and R&D intensity

		INNO	RDI
INNO	Pearson Correlation	1	,780(**)
	Sig. (2-tailed)	.	,000
	N	56	56
RDI	Pearson Correlation	,780(**)	1
	Sig. (2-tailed)	,000	.
	N	56	56

Source : the Author

Table 43: Correlations between the firms' innovativeness and **the firms' cooperation** with other economic, organizational and social actors.

		INNO	COO
INNO	Pearson Correlation	1	,846(**)
	Sig. (2-tailed)	.	,000
	N	56	56
COO	Pearson Correlation	,846(**)	1
	Sig. (2-tailed)	,000	.
	N	56	56

Source : the Author

Table 44: Correlations between the firms' innovativeness and the degree at which the Marketing function and activities are integrated into other departments and especially during new product development stages

		INNO	MAR
INNO	Pearson Correlation	1	,399(**)
	Sig. (2-tailed)	.	,001
	N	56	56
MAR	Pearson Correlation	,399(**)	1
	Sig. (2-tailed)	,001	.
	N	56	56

Source : the Author

Table 45: Correlations between the firms' innovativeness and the **skilled and qualified employees' intensity**

INNO	Pearson Correlation	1	,716(**)
	Sig. (2-tailed)	.	,000
	N	56	56
QI	Pearson Correlation	,716(**)	1
	Sig. (2-tailed)	,000	.
	N	56	56

Source: the Author

Table 46: Correlations between the firms' innovativeness and the different obstacles that face Innovation, within the Algerian Market

		INNO	OBLEV
INNO	Pearson Correlation	1	-,408(**)
	Sig. (2-tailed)	.	,002
	N	56	56
OBLEV	Pearson Correlation	-,408(**)	1
	Sig. (2-tailed)	,002	.
	N	56	56

** Correlation is significant at the 0.01 level (2-tailed).

Source : the Author

Table 47: Correlations between INNO and COO*MAR:

		INNO	COO * MAR / 4
INNO	Pearson Correlation	1	,727(**)
	Sig. (2-tailed)	.	,000
	N	56	56
COO * MAR / 4	Pearson Correlation	,727(**)	1
	Sig. (2-tailed)	,000	.
	N	56	56

Source : the Author

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ملخص:

من أجل ضمان مكانة أحسن و دائمة لها في السوق ، أصبحت المؤسسات مؤخرا تحاول جاهدة أن تحقق ميزات تنافسية من خلال التركيز على الإبداع و الابتكار، خاصة و انه قد أثبتت نظريا و تطبيقيا أن هذا الأخير يعد من أحسن الطرق لتحقيق ذلك. في نفس الوقت، أثبتت جل الدراسات التي احتضنت بهذا المجال أنه يجب ربط الابتكار بالتسويق غير أنه قد درست العلاقة بين الابتكار والتسويق دراسة معمقة و لكنهما لم تهتم جيدا حتى الآن، ل ذلك فهي بحاجة إلى المزيد من التوضيح خصوصا فيما يتعلق بحالة الجزائر. يهدف هذا العمل إلى توضيح الروابط الموجودة بين الابتكار والتسويق و إلى استنباط الخصائص الرئيسية للمؤسسات المبتكرة إضافة إلى تلك المتعلقة بالنظام الوطني للابتكار في الجزائر، يرتكز بحثنا على دراسة استطلاعية مبنية على استمارة موجهة إلى 56 مؤسسة، تحليل النتائج المتحصل عليها قادتنا إلى وضع نموذجين للتوزيع الثنائي آخذين بعين الاعتبار المتغيرات المؤثرة على النشاطات الابتكارية لهته المؤسسات، كما ساعدتنا هذه الدراسة على توضيح العلاقة المتينة الموجودة بين الابتكار و التسويق، هته النتائج يمكن أن تفيد كل من المؤسسات الصناعية و متخذي القرار في الجزائر من أجل تطوير ميدان الابتكار، و البحث و التطوير، و التنافسية.

الكلمات المفتاحية: الابتكار، التسويق، البحث و التطوير، الملكية الصناعية، براءة الاختراع، المؤسسات الجزائرية.

Résumé : Afin d'obtenir une position stable et supérieure dans le marché; aujourd'hui, les firmes essaient d'acquérir des avantages concurrentiels en se focalisant sur L'Innovation qui est prouvée théoriquement et empiriquement comme un meilleur outil pour réaliser cet objectif. En même temps, la littérature a démontré que l'Innovation doit être liée au Marketing, Or cette relation nécessite encore plus de clarification par les chercheurs et universitaires spécialement dans le contexte Algérien ; dans cette optique, le present mémoire vise à clarifier les liens entre le marketing et l'Innovation, à explorer les principales caractéristiques des sociétés innovatrices dans le marché algérien et celles-ci du System National de l'Innovation. Notre recherche est basée sur une étude exploratoire effectuée sur un ensemble de 56 entreprises, L'analyse de nos résultats Nous a aidé à présenter deux Modèles Logistiques Binaires; cette étude nous a permit en outre de découvrir une forte relation entre l'Innovation et le Marketing. Ces résultats pourront servir les entreprises industrielles ainsi que les décideurs en Algérie pour développer le domaine de l'Innovation, de l'R&D et la compétitivité.

Mots clés: Innovation, Marketing, R&D, Brevet, System National de l'Innovation, régression logistique, Entreprises algériennes.

Abstract:

In order to obtain a superior and a stable position in the marketplace; nowadays, firms aim to obtain a competitive advantage through focusing on Innovation which has been theoretically and empirically proved to be one of the best ways to achieve a competitive advantage. Meanwhile; the literature has shown also that Innovation needs to be linked with marketing; Nevertheless, This relationship has been well studied but not well understood. Thereby; it needs more explanation mainly in the Algerian context; from this viewpoint, This dissertation aims to clarify the links found between marketing and Innovation and to explore the main characteristics of innovative firms within the Algerian market as well as those of the National Innovation System; our work is based on an exploratory study carried out on a sample of 56 industrial firms, the analysis of our results helped us to present two Binary Logistic Models; and moreover, this study helped us to find strong relation between Innovation and Marketing. These results might be useful for the industrial firms as well as for the decision makers in Algeria to develop the field of the Innovation, R&D and competitiveness.

Key words: Innovation, Marketing, R&D, Patent, National Innovation System, Logistic Regression, Algerian firms.