Open Innovation in Business Ecosystem

– From the analysis of the Apple ITC Platform through its business ecosystem

Author(s): Sylvain Milon
Tutor: Dr. Pr. Philippe Daudi
Examiner: Dr. Pr. Björn Bjerke
Subject: Business Administration
ACKNOWLEDGEMENTS

This project would not have succeeded without the intervention of several people I would like to thank and dedicate my thesis.

First of all, I want to thank Prof. Dr. Philippe DAUDI because of his excellent cooperation and the motivation given to realize this research project. I am very grateful for his advices and support throughout my researches.

Secondly, this thesis would not have emerged without the support and trust of many people.

For their comprehension, I thank “Ouest Manutention”, my host company, and especially my two apprenticeship mentors, CEO Henry MATTE and Business Administration Manager Cecile DROUADAINE, who gave me their confidence, pushed me to succeed in this difficult work and without whom I would ever have accessed to this MBA. Then I want to thank Mr. PONTET, ESC Bretagne Brest Program Director to grant me the access to the double MBA Degree. As an apprentice in the ESC Brest, this program should not have been proposed to me.

I also want to gratitude two excellent Professors in the ESC Bretagne Brest who have always been attentive and fully available throughout the realization of this thesis. I am also grateful for their inspiration, support and time they was willing to devote. If this thesis has been achieved, with effort and enthusiasm it needs, it is partly thanks to the seriousness and the remarkable skills of greats Prof. Dr. Sébastien CHANTELOT and Prof. Dr. David MERIEAU

For her time, her help and advices in English writing skills, I want to sincerely thank my aunt, Catherine MILON.

For their strong support and encouragements all along my studies, I dedicate this thesis to my parents, my big brother and sister, all my friends and especially, for her patience, Nadège LEZIART.
Open Innovation in Business Ecosystem

ABSTRACT

Firms operate in an increasingly complex, unpredictable and fast-moving environment. Understand the business ecosystem in which an innovative company operates is a major leadership stake. Indeed, know how the various possibilities to interact with the actors present in the business ecosystem of an organization are part of the leadership role.

In order to survive facing competitive organizations, and to get a sustainable competitive advantage, an innovative organization must be able to combine with various partners on its business ecosystem in order to share knowledge and competencies, and therefore implement open innovation processes may be a key success factor that should not be sidelined. To do so, an organization must understand innovation to adopt open innovation processes, must also take into account various elements of its business ecosystem to settle competitive dynamics with stakeholders and be able to interact with these different actors, and to finish an innovative organization must be able to set open innovation processes to find a key success factor and perform a sustainable competitive advantage.

Keywords: innovative organization, business ecosystem, open innovation, ITC platform.
# Table of Content

**Chapter 1. Introduction: Background of the Study**.................................................. 9

**Chapter 2. Research Purpose**..................................................................................10

2.1. Research Questions ...............................................................................................10
   2.1.1. Main research question .....................................................................................10
   2.1.2. Related questions .............................................................................................10

2.2. Research Objectives .............................................................................................11

2.3 Research Perspectives ............................................................................................12

2.4 Research Scope .......................................................................................................14
   2.4.1 Conceptual framework map ...............................................................................14
   2.4.2 Innovative business organization ......................................................................15
   2.4.3 Business Ecosystem ..........................................................................................16
   2.4.4. Open Innovation ............................................................................................16

**Chapter 3. Research Methodology** ........................................................................18

3.1. The choice of a qualitative approach ..................................................................18

3.2. Sampling method ..................................................................................................20

3.3. Collection and data analysis .................................................................................20

3.4. Reliability, validity and limitations of the study ..................................................22

3.5. Conclusion ............................................................................................................23

**Chapter 4. An Open Innovative Business Organization**..........................................24

4.1. A new view of organizations ................................................................................24
   4.1.1. The complexity ................................................................................................24
   4.1.2. The platform of the complexity .......................................................................26
   4.1.3. The complex organization .............................................................................27

4.2 A new vision of innovation for a complex organization .........................................30
   4.2.1 Understanding the innovation .........................................................................31
   4.2.2 Adopt open innovation .....................................................................................36
   4.2.3 An organization based on the principles of open innovation .........................40
Open Innovation in Business Ecosystem

CHAPTER 5. THE GENESIS OF THE BUSINESS ECOSYSTEM CONCEPT ..............................................44

  5.1. UNDERSTANDING ELEMENTS OF BUSINESS ECOSYSTEMS ..............................................44
  5.2. THE COMPETITIVE DYNAMICS WITHIN BUSINESS ECOSYSTEMS ....................................51
      5.2.1. The co-evolution principle ...............................................................................................51
      5.2.2. Coopetition ......................................................................................................................54
      5.2.3. Electronic platforms: shared values and leadership within the business ecosystem ........55
  5.3. BUSINESS ECOSYSTEM AND OPEN INNOVATION ...............................................................58

CHAPTER 6. THE LINK, OPEN INNOVATION ..................................................................................62

  6.1. DETERMINANTS OF OPEN INNOVATION ............................................................................64
  6.2. THE ADVENT OF NEW BUSINESS MODELS FOR INNOVATION ..........................................66
  6.3. THE OPEN INNOVATION PRACTICES ..................................................................................69
  6.4. ADVANTAGES AND LIMITATIONS OF OPEN INNOVATION ................................................71
      6.4.1 Advantages .......................................................................................................................71
      6.4.2 Limitations .......................................................................................................................72
  6.5. CONCLUSION .......................................................................................................................73

CHAPTER 7. EMPIRICAL STUDY: TO WHAT EXTENT THE BUSINESS ECOSYSTEM CAN BE EFFECTIVE IN STEVE JOBS OPEN INNOVATION STRATEGY FOR APPLE? ........................................75

  7.1. CONTEXT ............................................................................................................................75
      7.1.1. Apple Company ...............................................................................................................76
      7.1.2. Steve Jobs, a “visionary” ...............................................................................................77
  7.2. APPLE, AN INNOVATIVE ORGANIZATION .......................................................................78
  7.3. APPLE BUSINESS ECOSYSTEM .........................................................................................79
      7.3.1. The ecosystem advent ....................................................................................................79
      7.3.2. An Electronic Business Ecosystem: The iTunes Store ..................................................80
      7.3.3. Main actors interacting in the iTunes Store ....................................................................80
      7.3.4. The App Store ................................................................................................................82
      7.3.5. The developers: A wide community ..............................................................................82
      7.3.6. Mobile Application Development: The coevolution concept .......................................83
      7.3.7. The remuneration models .............................................................................................84
      7.3.8. Conclusion ......................................................................................................................85
  7.4. APPLE ITC PLATFORM: LEADERSHIP WITHIN THE BUSINESS ECOSYSTEM ..................87
      7.4.1. Overview of the platform: ..............................................................................................87
      7.4.2. A platform facilitating interactions ................................................................................87
7.4.3. The Apple iPhone and the App Store: Sale of an ecosystem instead of a product.............88
7.4.4. Conclusion.............................................................................................................................................89
7.5. Open innovation in a closed business ecosystem: a paradox ......................................................... 90
7.5.1. Open innovation practices though the App Store ecosystem .........................................................90
7.5.2. A new effective business model........................................................................................................92
7.5.3. The paradox: A closed & perfectly controlled ecosystem..............................................................93
7.5.4. A business ecosystem targeting to open itself...............................................................................96
7.6. Empirical Study conclusion ..................................................................................................................96

CHAPTER 8. CONCLUSION & RECOMMENDATIONS ..............................................................................99
8.1. General summary of the study .............................................................................................................99
8.2. Research contributions .......................................................................................................................102
8.3. Research limitations ............................................................................................................................102
8.4. Future research opportunities...........................................................................................................103

REFERENCES .................................................................................................................................................105
Open Innovation in Business Ecosystem

LIST OF FIGURES

FIGURE 2.1. CONCEPTUAL FRAMEWORK MAP ................................................................. 14

FIGURE 4.1 REPRESENTATION OF THE PHENOMENON OF COMPLEXITY ......................................................... 26

FIGURE 4.2. ORGANIZATION ADAPTATION WITH COMPLEXITY ................................................................. 30

FIGURE 4.3. THE KEY COMPONENT OF THE INNOVATIVE ORGANIZATION ....................................................... 35

FIGURE 4.4. OPEN SYSTEM: CONVERSION OF INVENTION INTO INNOVATION ................................................... 39

FIGURE 4.5. CLOSED SYSTEM MODEL VS. OPEN SYSTEM MODEL ................................................................. 42

FIGURE 5.1. THE BUSINESS ECOSYSTEM VIRTUOUS CIRCLE (MOORE, 1996, P.28) ........................................ 45

FIGURE 5.2. BUSINESS ECOSYSTEM CHARACTERISTICS (PELTONIEMI, 2005, P.64) ........................................... 49

FIGURE 5.3. THE CO-EVOLUTION IN THE BUSINESS ECOSYSTEM (PELTONIEMI, 2005, P.35) .............................. 53

FIGURE 6.1. CLOSED INNOVATION VS. OPEN INNOVATION (CHESBROUGH, 2006, P.47) ................................. 63

FIGURE 6.2. CLOSED BUSINESS MODEL VS. OPEN BUSINESS MODEL (CHESBROUGH, 2007, P.27) ................. 68

FIGURE 6.3. THE ITC PLATFORM: RELATIONAL LINK BETWEEN OPEN INNOVATION AND ORGANIZATIONAL STRATEGY ON THE BUSINESS ECOSYSTEM ......................................................... 74

FIGURE 7.1. DIFFERENT INDUSTRIES INTERACTING ON THE APPLE BUSINESS ECOSYSTEM .............................. 81

FIGURE 7.2. FLUXES BETWEEN APPLE AND STAKEHOLDERS ON THE NUMERICAL BUSINESS ECOSYSTEM .... 86

FIGURE 7.3. ITC PLATFORM AT THE HEART OF THE APPLE OPEN INNOVATIVE ORGANIZATIONAL STRATEGY . 98
LIST OF TABLES

TABLE 6.1. THE MAIN DETERMINANTS OF OPEN INNOVATION (CHESBROUGH, 2003A, PP.45-57)...................... 65

TABLE 6.2. OPEN INNOVATION MODES: TECHNOLOGY & MARKETS (EIRMA, 2004, P.24)................................. 69
CHAPTER 1. INTRODUCTION: BACKGROUND OF THE STUDY

The intensification of global competition, market globalization and advances in information technology are in the process of transforming the economies of industrialized countries (Rabeau and Pernée, 2000, p.2).

In such an environment, particularly noticeable in areas of high technology (software, banking, biotechnology, information technology (IT) and telecommunications, etc), the boundaries of industries are more and more opening as a result of the accession to more knowledge and the increasing off shoring activities, which resulted in a convergence effect powered by IT. Moreover, companies operating in related areas now experiencing fewer difficulties to collaborate and distribute their operations with other partners. Thus, structures of industries take the form of a network where a simple product or service is the result of collaboration between several partners located in various parts of the world (Iansiti and Levien, 2004, p.19). These different cooperation dynamics within this vast network of partners are made more fluid and less complicated to manage thanks to the remarkable development of IT. Thus, innovation development for a company is made through an integrated electronic chain of worldwide partners, facilitated by remarkably fluid information fluxes, by easy exchange with partners and customers of the company and, above all, a quick innovation initiatives launching (Rabeau, 2007, p.9).

Before such a context, an urgent question must be addressed: in order to create value for customers and shareholders, how a company needs to develop its innovation strategy within such a network?

To further refine my questioning, the relation between ecology and business worlds, as put forward by many authors like Moore (1993, 1996), allowed me to develop the business ecosystem concept in order to better elucidate the appearance network advanced to above. Second, the paradigm of open innovation (Chesbrough 2003, 2007, 2011) allows to clearly describing the new innovative environment in which the business is located.
CHAPTER 2. RESEARCH PURPOSE

This chapter will be dedicated first to the main research question that will lead my study, and then will introduce the related questions. The three last subchapters will bring some details about the objectives, perspectives and scope of the research.

2.1. RESEARCH QUESTIONS

The research questions will be distinguished in one part by defining the principal question, and then the related questions on this study.

2.1.1. Main research question

The main purpose of this study is to understand all the essential elements of “How an ecosystem can contribute to open innovation strategies of innovative firms in order to strengthen their competitive position on the market?” by including the importance of each factor defining an open innovation strategy settled by a leader according to their business ecosystem.

2.1.2. Related questions

To give a better definition of what is the open innovation and to get a broader understanding of it and its use in a business ecosystem, I need to focus on three related questions that will nurture the main question. Those questions are:

- “Evaluate the main factors determining the possible adoption of open innovation for an innovative business organization”
- “Consider a business ecosystem and learn to interact in it”
- “Understand and use open innovation processes”
2.2. **Research objectives**

Innovation is a key mean to gain a competitive advantage by responding to market needs. Innovation is about creating new products and developing existing products, but also optimize its production system, adopting the latest technologies from basic research as its research and development department. There are basically two levels of application of innovation in the enterprise.

An organization can innovate punctually; it is called “innovation project” or “product innovation”. This is essentially a project to improve existing products, creation or adoption of new technology to a product.

An organization can also innovate permanently, in the long term. Here comes the innovation management. This is no longer to gain a competitive advantage but to sustain this competitiveness. At this level, innovation must become a pillar of corporate strategy.

The success of an innovation depends not only on the technological performance of a company. All of its resources (human, technical, financial, etc.) are indeed the key success factors of an innovative project. This is how a company will manage its capacity for innovation that will make it innovative. By definition, innovation is based on an original idea: We cannot innovate without new ideas. But the innovation lies mainly in the ability to turn those ideas into commercial successes. For this, there are methods and work techniques that help companies in all stages of innovation processes. Open innovation processes are one of them.

I focused on the open innovation subject because open innovation is the sixth and the last model appeared in innovation. It is a very interesting subject for me because I want settle my own mobile application business by makes it evolve through an incubator. My student partners and me are currently working on this project.

The research objective is therefore to provide new insights to business leaders, particularly those working in the field of innovation. Therefore, Apple Company seems an appropriate ground to consider both the various competitive dynamics inherent in
the business ecosystems and the open innovation management challenges within such environment. Thus, I deliberately chose the case of the well-known innovative company Apple, where the innovation management strategy within the NTIC sector, answer to some extent at least, to my main research objective.

### 2.3 Research perspectives

The "open innovation" term was used for the first time in 2003 by Henry Chesbrough, professor and center director wanted for Open Innovation at the University of California, Berkeley, in his book ‘Open Innovation: The New Imperative for Creating and Profiting from Technology’. In a later version of his book published in 2006, Professor Chesbrough defines it as follows: "Open innovation is the use of purposive inflows and outflows of knowledge to accelerate internal innovation, and expand the markets for external use of innovation, respectively" (Chesbrough, 2006, p.1)

In other words, open innovation is upstream: the increased use of information sources and external knowledge to the company and downstream: the commercialization channels multiplication of those intangible assets in order accelerate innovation.

This current is an alternative to the traditional mode of "closed development" that business innovations are only those that emanate exclusively from its department of R&D and evolving in secrecy.

Contrary to the belief of some people, open innovation does not mean that knowledge or technology will be free, in the sense that this term can have in the field of free software (open source) which let circulates the software source code for use and improvement by the public without royalties. Indeed, the term "open innovation" refers to a method of open collaboration between various partners in a business ecosystem to develop a common project, which does not exclude the protection through intellectual property rights and licenses granting with royalties on research results.
Open Innovation in Business Ecosystem

In an open innovation model, companies use various information and knowledge sources in their innovative activities such as R&D, new technologies acquiring, specialized human capital hiring, etc. To improve productivity and competitive capabilities of companies in the market, they increasingly tend to externalize these information sources through interactions with various partners.

There are of course crowdsourcing, a practice for an organization to outsource an activity, through a website, drawing on the creativity, intelligence and expertise of the Internet community users to create content, develop an idea, solve a problem or achieve an innovative project at a lower cost. However, such a practice based on consumers does not directly target a partner with specific skills or knowledge to carry out a large joint project.

For such a large project where some specific expertise is required, the partnership will often be targeted between various stakeholders in the private and/or public domain, or the academic field. These partnerships can take many forms such as partnerships between a company and its suppliers, alliances or joint ventures between private stakeholders in the same sector, consortia between universities and companies, spin-offs, etc.
2.4 Research Scope

2.4.1 Conceptual framework map

In order to determine a scope for my study, I made a framework map presenting the all the aspect present in this thesis.

Figure 2.1. Conceptual framework map

I develop my conceptual framework based on the business ecosystem and open innovation concepts. It is thereby considered to what extent does the business ecosystem can be a management strategy of open innovation.

Based on the literature review, I admit that a company wishing to excel by adopting the paradigm of open innovation is imperative to develop links with customers, institutions
Open Innovation in Business Ecosystem

(universities, research laboratories, government, etc) and other partners (manufacturers, competitors, etc) in order to access ideas and technologies to ensure their sustainable value creation. Obtain assurance by maintaining these links between the different actors may not only be achieved through a coevolution process that would strengthen the interdependence between the actors within the same business ecosystem. In addition to this coevolution, relationships involving competition and cooperation illustrate special situations of coopetition. Moreover, electronic trading platforms play a fundamental role not only in the sharing of value by all members of the ecosystem, but also and especially in the management of contributions from various stakeholders around company. This allows, therefore, introduce the concept of openness in the operations of business innovation. Similarly, the nature of the firms’ business models is highly dependent on the environment in which they are located. Implement business models that may affect the innovation process and creating new opportunities for generating value can actually be done, but only in a supportive environment where a multitude of interdependent actors share their ideas and technologies with those of the company. Therefore, this knowledge sharing is established on the basis of a rich portfolio in terms of innovation practices by technology and enterprise markets.

2.4.2 Innovative business organization

An innovative business organization evolves in the complexity, a complexity coming from its environment. A complex organization needs to know how to understand complex phenomena, how to manage its resource based, so its knowledge and competencies. Moreover, a complex organization has to manage internal and external exchanges. By choosing external exchanges management and so dealing with the complexity surrounding, a complex organization opens it system.

Open systems allow organizations to interact with their environment. Thus, an innovative company dealing with its environment and sharing knowledge creates more value by partnering with stakeholders from its industry or another, an offer the opportunity to its stakeholders to create more value too. This idea is the basis of a business ecosystem. Furthermore, by externalizing Research & Development (R&D) projects, an innovative organization begins its ascension into an open innovation process.
2.4.3 Business Ecosystem

The business ecosystem is presented as a business strategy to cope with new issues market, where innovation has become essential to create the value for customers and shareholders. During my literature review, I will detect not only the various features related to this concept, but the main challenges facing companies operating in this environment.

Furthermore, analysis of the principle of co-evolution as well as the dynamics of coopetition, mention the study of electronic platforms will enable me to explain as clearly as possible the competitive dynamics within this environment and reticular, especially, to put forward the issues associated with the interdependence of actors in relationship management (Gueguen and Boucher, 2004, p.4), shared values and leadership within this complex structure.

2.4.4. Open Innovation

As I will mention in Chapter 6, the open innovation process is to consider that the social network is the source of innovation, not only a particular company (Rabeau, 2007, p.17). Thus, as has been inferred from the work of Chesbrough (2003a, pp.45-57), numbers of factors encourage companies to opt for this kind of process. As a summary, remember the nature of each determinant of open innovation:

- Useful knowledge has become widely available;
- Ideas that are not used may be lost;
- Idea or technology value depends on its business model;
- Presence of venture capital modifies the innovation process for each;
- Companies must be sellers and buyers of intellectual property assets.

Achieve benefit from the ideas and technologies available outside, however, requires on the part of companies, a reconfiguration of their business models to ensure continuous efforts in innovation. As a result, companies are being forced to combine various
Open Innovation in Business Ecosystem

approaches to innovation (spin-in/spin-off, internal development, acquisitions, etc) to ensure proper positioning in this new innovation.

Finally, they must be aware of the benefits and limitations are associated with this paradigm.
CHAPTER 3. RESEARCH METHODOLOGY

This part will focus on the methodological aspect of the research. So I will describe the methodology I used in order to do this study by first supporting the approach for this purpose. We will then describe the various phases involved in the research process, which are: Sampling, data collection and analysis, and study the reliability, validity and limitations of the study.

3.1. THE CHOICE OF A QUALITATIVE APPROACH

The study of the Apple business ecosystem as a management strategy for open innovation requires a detailed analysis on multiple dimensions: the diversity of actors within the ecosystem, the degree of interdependence between these, the business model implemented by Apple, innovation approaches deployed by this firm, etc. The research purpose also requires the adoption of a particular perspective to understand how does a company working in the high technology field is able to adapt to these dimensions. Given the complexity of the research object, a quantitative approach was also difficult to envisage.

Indeed, to understand phenomena related to the research subject, we must now use a holistic vision. This vision will enable us not only to achieve detailed situations and events descriptions, but also to gain a thorough understanding of the behavior of actors evolving in this ecosystem, and the interactions among them (Gagnon, 2005, p.23).

Qualitative research methods are the only ones to make available such a holistic approach. According to Yin (2003, pp.9-11), choosing a research strategy depends on the shape of the research question, the level of control that the researcher may take on the events being studied and on the contemporary nature (or not) of the phenomenon linked to the study. Yin adds that the case study is the best research when the research question focuses on the ‘how’ and ‘why’ of a phenomenon, even if the researcher has
Open Innovation in Business Ecosystem

little or no control over events and if the phenomenon study is contemporary, which corresponds well to the situation of this research.

The case study is defined as "an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between the phenomenon and context are not clearly evident" (Yin, 2003, p.13). Indeed, Woodside and Wilson (2003, pp.497) state that this research method is appropriate for the description, explanation, prediction and control of processes involved in various phenomena, no matter that they are individual, in group or in an organization.

The development of theories from case study has some advantages, including the fact that there are good probabilities to generate a new theory, this theory can often be tested using structures, which can be easily measured (Eisenhardt, 1989, p.540).

To account the impact of something as complex as the management of open innovation within a business ecosystem, it is useful to conduct a longitudinal study that is insuring a period of time as long as possible. That is why this research covered a period from the return of Steve Jobs in Apple Company (1997) until the end of is exercise in the firm. Indeed, the historical reconstruction of the evolution of a leader is instructive because it allows a better understanding of changing innovation activities since its arrival and, more importantly, observing changes in its business ecosystem as well as the whole relations with all stakeholders.

The approach of this paper is therefore intended, at least in part, descriptive. Indeed, I will begin by conceptualizing an innovative firm (Chapter 4), followed by a detailed analysis of the business ecosystem (Chapter 5) and open innovation (Chapter 6) before finally compile a thorough analysis of the interactions between the Apple Company and the actors present in its business ecosystem, thanks to data collected (Chapter 7).

This whole study will conclude in Chapter 8 by taking the findings during the empirical study (Chapter 7) and linking them with the literature reviewed in Chapter 4,5 & 6.
3.2. Selection of the Case Study

I have deliberately chosen the case of Apple acting with its business ecosystem, which responds to some extent to my main research objective. As the firm develops its activity with support from various stakeholders, which help it promote its offer: this is indeed one of the basis of the business ecosystem concept. In addition, partnerships and alliances undertaken by the company in its R&D encourage me to see more closely the place of open innovation in the various operations of the Apple Company.

Thus, given the above observations, the choice of the company was not neutral. Moreover, I checked, as far as possible, cases, articles and research papers that have been published since the early activities as the Apple CEO of one of the most visionary leader: Steve Jobs.

3.3. Collection and Data Analysis

This research is based on secondary data. While taking care to gather information that was intended as exhaustive as possible, I opted for the most reliable sources and known for their credibility, at least when that choice was offered to me. When possible, I also performed a triangulation of data to verify the veracity of information available. The secondary data were collected from five main sources:

- Annual reports of the company;
- Press releases;
- Magazines and newspaper articles on business;
- Case studies;
- Research reports.

The choice to base an analysis on secondary data derived from the impossibilities to obtain an understanding of the internal reality of Apple through primary data from Apple Inc, as the company is known to nurture internal secrecy.
Open Innovation in Business Ecosystem

However, the secondary data as Steve Jobs Keynotes, Annual Apple Reports, but also testimony from partners or competitors found on the internet, even case studies and research made by professional consultant companies have deeply helped me to elaborate my empirical study. Secondary data advantages lies in their availability, and also because of their greater objectivity in evaluation.

Finally, when analyzing this database, I followed to the extent possible, the approach of Miles and Huberman (1994) and De Weerd-Nederdho (2001), which consists of a back and forth of three competing activities:

1 - the data purifying: Select, simplify and transform raw data in order to identify the essential components;

2 - coding and analyzing data: Meeting the information units directly associated with the studied phenomenon (Catterall and Maclaran, 1996; Huberman and Miles, 1994). According to Huberman and Miles (1994, p.108), this could be done by using matrices, tables, charts and graphs as presentation formats, or by grouping information into paragraphs, and, after making several complete readings to familiarize with the content and, above all, by being aware of the global sense given off;

3 - codified data analysis: concluding by letting the data expressing themselves and by checking if any trends emerge, i.e. if some evidence of different sources converge on similar facts (Yin, 1981, p.64).

Moreover, I based my research methodology on the grounded theory. Indeed, this method provided an approach that would encourage innovation by a method of rooting in the analysis of field data (Strauss an Corbin, 1994, pp.1-18). The central principle in the data analysis is the constant return to the comparison between the theoretical analysis and empirical data. Not only the analysis takes as its starting point the first episodes of data collection, but also it continues in a validation process that is constantly coming back, or the already collected, or new data. So instead of force theories on empirical data interpretation, I opened the emergence of theoretical elements or concepts that was suggested by field data and theoretical analysis. This constant return
to the roots and the constant validation to examine whether the products of analysis are well adjusted to the empirical data are the basis of the claim to innovation. Indeed, attention to what emerges from the field can discover original points of view, especially since this implies that careful analysis develops according to questions from the land, not existing theoretical frameworks.

Validation discussed above involves more than an audit. This is, indeed, a constant adjustment to what is happening on the ground. This adjustment directs the entire process from the formulation of themes, through the process of collecting and analyzing data, until the very end of the process of theorizing. In sum, the primacy given to the emergence usually results in analyzes of ways of theorizing that have not yet been explored. Therefore it is possible to talk in terms of innovation.

3.4. **RELIABILITY, VALIDITY AND LIMITATIONS OF THE STUDY**

Among the great strengths of the case study we found its ability to provide a thorough analysis of phenomena in their context, and its ability to offer the opportunity to develop historical parameters (Gagnon, 2005, p.32). Specifically, the strength of this research method is its ability to provide strong internal validity. According to Eisenhardt (1989, p.546), the probability that the theory developed using a case study be valid is indeed high; the development process of this theory is intimately related to empirical reality.

The generalization of the results (resulting theories) beyond the case(s) studied, however, is one of the inherent difficulties in this research method. Unlike a quantitative approach where “statistical generalizations” are well accepted, case studies lead to “analytic generalizations” (Yin, 2003, pp.31-33). Yin also states that the findings of a case study can sometimes not be applied generally. Consequently, these findings should be tested on other samples in order to develop a true generalization. This is one of limitations to this research.

Ultimately, it is important to remember that using the case study must comply with certain scientific standards. In addition, its realization must be characterized by rigor
Open Innovation in Business Ecosystem

equivalent to that of quantitative research methods (Yin, 2003, p.34). Its use must be grounded in a systematic approach where the validity and reliability of data and results are demonstrated. As Eisenhardt (1989, p.543) highlight, it is largely based on the rigor shown by the researcher in carrying out each stage of the research process.

3.5. Conclusion

In this chapter, I presented the methodology that both seemed more appropriate to the theme of this research and which corresponded most to our interests. I therefore opted for a case study based on secondary data. Conduct an analysis of the business ecosystems and open innovation, however, is essential elements for understanding the innovation context within which Innovative Apple Company is. That will be the subject of the next chapters (4, 5 & 6).
CHAPTER 4. AN OPEN INNOVATIVE BUSINESS ORGANIZATION

4.1. A NEW VIEW OF ORGANIZATIONS

Before giving a mode of understanding of innovation and processes derived from innovation, it is important to observe in what kind of environment organizations are evolving now. Therefore, we are interested in phenomena related to the growth of organizations and hope to give a new vision of those processes.

4.1.1. The complexity

First, let’s explore on the concept of complexity. This universal concept applies to any environment. It is therefore necessary to deal with this complexity. By understanding its principles, we will be able to apply them—in the following sections—to organizations.

First, we make the difference between what is simple, complicated and complex. What is simple and what is complicated can be controlled in an ordered universe, not what is complex. Indeed, what is complicated can be simplified and understood, as the mechanism of a watch based on relations of "causality". What is complex, however, takes into account a multitude of interactions with retroactive effect (disordered universe), such as weather phenomena. This multitude of cross-feedback is simpler and is the result of chance. (Morin, 2005; Snowden and Boone, 2007).

“Is complex what cannot be summarized in a key word, which cannot be reduced to a law that cannot be reduced to a simple idea [...] this is a network of heterogeneous inseparably associated constituents.” (Morin, 2005, p.10)

“Complexity is a process where different fields interfere with each other [...]”. (Oliveira Martins, 2005, p.2)
Thus, the complexity cannot be controlled with a simple way of thinking. Only the acceptance of the complexity itself (or complex thought) offers pathways to understand the emergence of patterns (Snowden and Boone, 2007, p.6).

Edgar Morin proposes a definition of complexity: “The simple thought solves simple problems without thinking. Complex thought does not resolve on its own problems, but it is an aid strategy that can solve them”. (Morin, 2005, p.86)

In his book ‘Introduction à la pensée complexe’ (2005, pp.93-112), Edgar Morin proposes three principles to suggest the complexity:

1. The dialogic principle.
2. The principle of organizational recursion.
3. The hologramatic principle.

The dialogic principle corresponds to the group of inverse processes or inseparable contradictory ideas and even necessary for the understanding of some phenomena. Thus, to control, for example, a complex principle as slash and burn (which corresponds to the action of burning the land to make them more fertile), it will be necessary to join two opposite to each other: destruction and creation.

The principle of organizational recursion comes from the production of the product: a virtuous cycle of creation. Take the case of reproduction; this complex phenomenon is conceivable if we apply on it this principle. Thus, a man, by reproducing creates other men and so on. In the case of vortices, it is the spiral movement that is self-producer.

Finally, Morin discusses the hologramatic principle. This principle implies the presence of “parts in the whole” and “whole in the parts”. It can be illustrated by the example of the individual in society that constitutes a “part in the whole” and “whole in the part”
because of the learning by society of a language, culture, standards since his birth. Every individuals (the parts) living in a society have this society (the whole) anchored in them.

In conclusion, we can say that the concept of complexity implies the need to deal with it by applying three principles (the dialogic principle, the principle of organizational recursion and the hologramatic principle). I propose below a very refined representation of the phenomenon of complexity by emphasizing the presence of inter-retroactive loops on which we can apply the principles developed above. The arrows represent the interactions and are of different colors (green and white) to reflect their distinct nature. Thus, acceptance of complexity and its principles is similar to the understanding and the cope with our environment.

**Figure 4.1 Representation of the phenomenon of complexity**

![Diagram of complexity](image)

**4.1.2. The platform of the complexity**

A mode of understanding of the concept of complexity given, it is interesting to see the impact it can have on knowledge. Thus, the knowledge will become a platform between the principles of complexity in complex organizations and more specifically for innovative companies.
Open Innovation in Business Ecosystem

Indeed, given the complexity, several questions emerge. How we are capable of understanding complex phenomena? Where are the limits of our knowledge? How can we overcome them?

In interviews with Samuel Thomas (2007), Edgar Morin says: “we do not know what is going on, but this is what happens”. Such is the incapacity to master the complexity.

“There is an insurmountable barrier to the achievement of knowledge. But it can also be seen as an incentive to the exceeding of knowledge.” (Morin, 2005, p.18)

What Morin says here is that interest in the human mind is not to reject or to simplify complex phenomena, but on the contrary to push its limits to the maximum by accepting that there is a multitude of non-controllable variables. Thus, it is advisable to deal with complexity in order to grow intellectually.

Morin (2005) also explains that there is reciprocity of knowledge on the knowledge to make it grow. This phenomenon of reciprocity is presented in the context of contemporary complexity. It is also present in the work of Tocqueville (1831) in the form of a social phenomenon that enables the freedom of American democracy.

“Feelings and ideas are renewed, the heart enlarged, and the understanding developed only by the reciprocal action of men one upon the other.” (Tocqueville, 1831, p.515)

Thus, we can conclude by saying that the art of dealing with complexity is reached by the acceptance of certain principles and by the will of men to share their knowledge.

4.1.3. The complex organization

As we saw in the previous sections, complexity affects the entire environment and should deal with accepting its principles and the phenomenon of reciprocity. We will now study the impact of complexity in a specific area. Indeed, it is interesting to examine the state of knowledge in organizations operating in a complex environment. For this, I will give a mode of understanding of the complex organization and its related phenomena.
Edgar Morin explains that the organization (the "whole") is more and less than the sum of its parts: More because such molecules combine to form a new entity and consolidation leads to another point. Less because the combination may have a retroactive action of the parties, as in the case of social organizations that reprimand more than they give freedom (Morin & Thomas, 2007).

You can also take the example in his book ‘Introduction à la pensée complexe’ (2005, p.113) of tapestry. Tapestry may indeed have more virtues than the thread that makes it up and vice versa. This principle, that the whole is greater than the sum of its parts, is called Holism (Smuts, 1926, p.24). Thus, we understand that the organization becomes a new "part" in itself. So it follows the hologramatic principle discussed above.

Following the hologramatic principle of complexity and applying it to the organization, this organization can be seen as a miniature society, made up with three components interacting among themselves and with their environment in complex ways. The first component is the structure that corresponds to the physical, strategic and political organization (e.g., goals, assets, rules, etc.). The second is the culture, which includes normative and affective behaviors that influence both internally and externally (e.g., ideologies, symbols, customs, etc.). The third component corresponds to the individuals of the organization. These three separate components of the organization are complex because they interact and are both products and producers of their environment. (Allaire and Firsirotu, 2004, pp.92-104)

Moreover, a complex organization, as a living organism, fights against disorder and destruction in regenerating. To do so, it must make exchanges between the inside and outside. To survive this complex organization must also feed on other organizations to support it. (Morgan, 1999, p.34)

To survive, the organization enters into a complex interaction processes with its environment. There are exchanges between internal and external elements in order to grow. This phenomenon of self-organization is similar from one hand to the reciprocity
Open Innovation in Business Ecosystem

of human knowledge (in its bidirectionality) and to the other hand to the law of
"requisite variety" (by its complexity). This law states that to deal with a varied
environment and therefore complex, the organization must show at least as much
variety and complexity (Ashby, 1958, p.89). Finally, this complex process of
bidirectional exchanges between the organization and its environment is what is called
an open system, a model or a coherent set of elements and processes that interact with
their environment out. In fact, it is by adopting this system that the organization
survives and grows. (Genelot, 2001, p.124)

In conclusion, we can say that complex organizations operate in an environment where
interactions are multiple and outcomes of chance. In order to survive and develop there,
they should consist with the principles of complexity and the law of requisite variety
and they do show reciprocity as in the case of knowledge. To do this, complex
organizations should adopt an open system to promote bidirectional exchanges with
their environment. In the following figure, I seek to represent how the organization
adapts to the complexity. I present on the one hand, a closed organization whose
operation is self-sustaining (1); on the other hand, we can observe an organization that
opens itself to a complex environment, integrates in it and prospers (2).
4.2 A NEW VISION OF INNOVATION FOR A COMPLEX ORGANIZATION

We have seen that organizations evolve in a complex environment to which they must open in order to survive. Thus, after defining the complex organization and its principles, let’s see the processes that compose this complex organization. Among these
Open Innovation in Business Ecosystem

processes, as explained in the Research Purpose, I chose to focus on innovation, as it is since the end of the twentieth century a new aspect in line with the principles of a complex organization. Indeed, understanding the concept of innovation and consider the current context in which businesses operate, permit to highlight the complex process of the contemporary innovation.

Innovation is the result of a global process in which R&D is only one ingredient among many, to be integrated into a complex organizational process. [...] Innovation is the result of multiple processes involving many functional and organizational factors (Morand and Manceau, 2009, pp.34-36).

I will therefore in the following sections give a mode of understanding of the innovation concept then I will show the principles in line with complex organizations and open system. Finally, I will make a summary of the implications of this new business innovation by comparing closed and open systems.

4.2.1 Understanding the innovation

At first, we must understand that innovation is a concept too often reduced to that of invention. Indeed, the distinction between these two concepts is very important, innovation concerns inventions, but only if they are born in destination to markets (Baumol, 2002, p.56). I will therefore understand what may be an invention and how it can be marketed and thus converted into innovation.

So let’s look on the invention concept. Often wrongly reduced to a new technology, an invention is a much broader concept that is how to identify new links between some elements that seemed so separated (Bronowski, 1958, pp.58-59). Therefore, this concept includes all the ideas to accomplish a task unexpectedly.

We can distinguish two types of innovation resulting from the nature of the invention: technological innovation and innovation by usage. The first involves the appearance of an invention within the meaning of new technology while the second is redefining how
to use an offer by the emergence of new unexpected connections. To illustrate, we can take the example of the compotes to drink, or how to redefine the consumption of a product by linking a method of consumption of a product previously unthought-of or rather "unthinkable." Note that these two types of innovation are not mutually exclusive and can be combined as in the case of the Nintendo Wii-Fit, mixing new technologies with a new application of the offer (Morand and Manceau, 2009, pp.66-68).

Returning to the concept of innovation that corresponds to the commercial exploitation of an invention. Take for example India and China. Both countries now have well-developed science parks but lack of the resources and infrastructure necessary for the commercialization of new technologies. In contrast, the United States, they lose their supremacy certainly in terms of research, but have ability to market inventions, allowing them to maintain their leading position in the market (Bhidé, 2009, pp.2-5).

This illustrates the fact that economic growth linked to innovation is attainable, not by the excessive acquisition of knowledge but by the acquisition of assets dedicated to its use (Bhidé, 2009, p.6).

Thus, we understand the importance not only of the invention but also its marketing process. Indeed, to convert an invention into innovation, organizations must make it available and for that they should focus on their ability to combine a latent or expressed practical need and an aesthetic need for its adoption. Innovation can thus correspond to new processes, services or other ways to communicate with the market (Brown, 2008, p.3). What can be learned here is that the conversion of invention into innovation is possible through the identification of opportunities in terms of market needs and by the development or redesign of a business model that promotes the marketing of an offer meeting the need.

Before we look at business models, let's look on how to make an invention usable by connecting it to a need: the detection of business opportunities. The opportunity perceived can be understand as a mean to generate economic value that is not and has never been exploited. Similarly, the detection of opportunities can be understood as one or more cognitive processes that enable individuals to identify an opportunity. The cognitive process is part of an algorithm type scheme according to patterns (Baron,
Open Innovation in Business Ecosystem

2006; Vaghely and Julien, 2010). Thus, the pattern creation in the contextual changes that lead to the detection of opportunities (or not) is made possible by three factors specific to the leaders of organizations: Search, Alertness and Knowledge.

First, the active research for information on the environment of the organization is essential and spontaneous factor in the detection process.

Second, the leaders "on alert" can distinguish patterns less actively for an almost unconscious mean.

The final factor necessary to explore links between the surrounding elements comes from knowledge and experience of those leaders (Baron, 2006, pp.104-119).

Finally, this method allows managers to determine relationships unnoticed in their environment and therefore a need appropriate to the invention, and vice versa, through patterns creation.

It is now necessary to understand how the marketing of an invention is made possible. Chesbrough (2003b, pp.76-81) uses the example of FedEx who used the Internet and offered to its customers an online tracking service for packages. This offer, until here absent, allowed FedEx to create a competitive advantage because it filled a need. Thus, the success of their innovation comes from the company's ability to integrate an invention (Internet) by connecting it to a market need by altering its business model. Indeed, the invention commercialization and thus the innovation concept are made possible by the business model adopted by the company.

“We consider innovation as the exploitation of new ideas into new products or services, new business models and new ways of working”. (Morand and Manceau, 2009, p.42)

In conclusion, we have seen here that innovation is a concept much broader than it appears (not just a technological novelty), but an organizational process incorporating both the invention and the need for the search of opportunities and the development of a business model. In addition, knowing that the organization is a combination of a
structure, a culture and individuals, we understand that innovation as an organizational process has a direct impact on these three components (Allaire and Firsio, 2004, p.102). Thus, I propose the following diagram where the structure, the culture and the individuals of the innovative organization are the result of a complex combination of key components of the Research (green) and Development (violet) i.e. the invention related to the need and the opportunity’s research related to the development of a business model.
Figure 4.3. The key component of the innovative organization
4.2.2 Adopt open innovation

We now have an understanding of what is innovation. However, as we have seen in the first part of this chapter, the context in which the organization evolves has an impact on its own nature. Thus, in order to apply the principles of complexity and openness to innovation, we focus here on a contemporary vision that Chesbrough (2003a, p.34) calls Open Innovation.

Since the 80s, the business has changed: the competences are more mobile, capital markets are freer and product life is shorter (Chesbrough, 2003a, p.12). It is also what mentions the book ‘Stratégies et moteurs de performances’ (Allaire and Firsiriotu, 2004, pp.12-14), which introduces the context called “Mutual Loyalty” and the contemporary context of the “Three Markets” (competences market, capital market and products & services market).

We are interested in a first step to the mutual loyalty concept where enterprises operated before the 80s. Indeed, firms formed stable employees in order to create a competitive advantage that allowed them to ensure the supremacy of a unique product or service, whose incomes were re-injected into the company (Allaire and Firsiriotu, 2004, p.68). Capital and competences were very static, making the business environment (competitors, suppliers, etc.) very small. Companies searching the control of novelty and promote vertical integration and the protection of their knowledge by working in self-sufficiency in a very small system develop a closed innovation system (Chesbrough, 2003a, p.30).

Thus, if in the context of mutual loyalty, the closed innovation model is adequate. We can then in a second step note that changes involved in terms of movement of the three markets make firms adopting a closed innovation, which is vulnerable: intellectual property can not be retained internally because it travels in a cross-border business (Genelot, 2001, p.53).

The advent of Information Technology (IT) is no stranger to this context change. Indeed, the progresses made by the current IT now allow everyone to have access to
Open Innovation in Business Ecosystem

confidential information. The licenses and patents reach very quickly their limits and new technologies can be quickly copied or improved (Manyika, 2007; Thackara, 2009).

In summary, we are able to argue that the movement of skills and so knowledge complicate the current environment of organizations. As we have seen in the previous section, in a complex environment, the organization follows the law of requisite variety, adopts a complex system and demonstrates reciprocity. Furthermore, as innovation is part of the organization as the hologramatic principle of complexity (Morin, 2005; Ashby, 1958), it follows the same rules: innovation is complex and adopts reciprocity. This is called open innovation (Chesbrough, 2003, p.4).

We can also say that since innovation is an invention related to a need and also looking for opportunities related to the development of a business model, its openness would affect its components in terms of complexity and reciprocity. Thus, I insist on the following: inventions, detection of opportunities and business models of organizations adopting open innovation.

Concerning inventions, knowing that competences and intellectual property can not be retained internally but are at the contrary brought to travel between businesses and the market, the ability of an organization to create value from this economic phenomenon is no longer in possession of an invention, but in marketing of any invention regardless of the location from which it emerges (Brown, 2008; Bhidé, 2009; Estrin, 2009 and Varian, 2009). Thus, the invention can equally emerge internally and externally and can be subsequently developed within the organization or move to a third party or a spin off (Chesbrough and Garman, 2009, p.73). This dynamic is associated with the practice of reciprocity explained above.

It also corresponds to the bidirectionality of knowledge: "This double information flow, from the center to the periphery and the periphery to the center, is absolutely essential for the functioning of the company." (Genelot, 2001, p.172)

With regard to the opportunities detection, we saw before that this method was based on a cognitive approach and so outcomes from the development of specific patterns to
the leaders. However, movements in the three markets involve a broader, more complex, where a multitude of individuals interact. Leaders are no longer alone to act in the needs recognition process linked to inventions. In fact, leaders should now deal with a constructivist approach to this method, namely an approach based on the information sharing, trials and errors (Vaghely and Julien, 2010, pp.73-78). Thus, upon detection of opportunities, I will combine the three factors (Search, Alertness and Knowledge) and add a fourth: the breadth of leaders’ social networks (Baron, 2006, p.111). In this way, detection of needs that apply to an invention leads to its conversion and became a joint effort of individuals in order to create economic value and innovations at the service of this group. By mixing the information sharing and research application of an invention in a collective manner, we arrive at the concept of co-creation, corresponding to the creation and marketing of ideas by a vast network of competences and individuals possessing complementary expertise (Bughin, 2008, p.7).

Finally, regarding the business model of open innovation, we must understand that as everything else in the organization, it will be complex and will facilitate exchanges between internal and external to be opened.

“Generally speaking, companies should involve external perspectives deeply in the innovation process. They should have well-defined ways to interact routinely and repeatedly”. (Anthony et al., 2008, p.143)

Take the case of Intel, a manufacturer of microprocessors. These goods are in a value chain going beyond the boundaries of the firm. Also, the manufacturer chooses an open innovation model because information needed for the development of its inventions depends on the partners that will use its microprocessors. By focusing its business and being responsive to the market, Intel has created a business model for interaction (information and processes) and co-creation. It then becomes a vital link in its sector by participating in the rapid development of the computer industry (Anthony el al., 2008, pp. 144-145).

In conclusion, we can say that to innovate in today’s environment and thus create value, survive and grow, it is preferable to adopt an organization promoting open innovation. To do this, leaders must adopt a business model based on an open system supporting co-
Open Innovation in Business Ecosystem

creation. Such quantum physics, the business model integrating the processes of open innovation is attached and makes permanently interact the infinitely small (the individuals) and the infinitely large (globalization of competences and processes) acting in a positive way for all stakeholders.

On the following diagram, we can observe the movement and especially the sharing of inventions (external in green and internal in violet), and the opportunities detection method that lead (or not) business to the development of a business model for open innovation.

**Figure 4.4. Open system: Conversion of invention into innovation**
4.2.3 An organization based on the principles of open innovation

To summarize the principles of open innovation, before entering widely in it (Chapter 6), and their implications at the business model level, I propose to group but also compare the principles derived from the literature on open and closed systems.

Also, in the first section we have seen that the organization operates in the complex and to survive they had to adopt an open system promoting exchanges between the internal and external. In the previous section, we went in more detail by studying an organization process: innovation. Knowing that innovation has an impact on the
Open Innovation in Business Ecosystem

structure, culture and individuals of the organization, we understand that open innovation requires an open system specific to complex organizations in the current context of the three markets. So we understand that contemporary innovation is an open system process.

The transition from the closed to open organizational system has two implications: a new relationship with the environment and a new organizational strategy. Thus, in the following figure, in order to compare the two systems, we show both aspects. The relationship to the environment comes from the principles of open and closed systems. Organizational strategy is derived from the principles of open and closed innovation. The confrontation of these principles (column left and right) can identify the tracks to be followed by the leaders in terms of building organizational system.

Finally, to explain the observations collected in the literature, I complete the figure by two diagrams, one representing the closed system and the other the open system. The first is a red dot representing the organization (O) in its environment (E). In this representation, the organization is closed, intangible with a restricted environment. In addition, we emphasizes on the idea of closing by showing that each organization has its own environment and does not "blend" it with other organizations and environment: there is no sharing.

The second diagram depicts the organizations in red (O) as mass-like variables and permeable boundaries operating in a common and extensive environment (E). This allows showing that organizations are adaptable, open to sharing with each other and an environment beyond their market.
Figure 4.5. Closed system model vs. Open system model
Closed System

System Environment

Punctual interactions of the organization with its environment (Morgan, 1999, p.28)

Restrained, closed and intangible system (Genelot, 2001, p.54)

Environment reduced at the organization and its market (Genelot, 2001, p.54)

Organizational Strategy

"The smart people in our field work for us." (Chesbrough, 2003a, p.26)

"To profit from R&D, we must discover it, develop it and ship it ourselves." (Chesbrough, 2003a, p.26)

"If we create the most and the best ideas in the industry, we will win." (Chesbrough, 2003a, p.26)

In line with the model of “Mutual Loyalty” (Allaire & Firsirotu, 2004, p.12)

Open System

System Environment

Permanent interactions of the organization within its environment (Morgan, 1999, p.65)

Large system, adjustable quickly and unexpectedly (Genelot, 2001, p.89)

Extended environment (political, social, economic etc.) (Genelot, 2001, p.90)

Organizational Strategy

"Not all of the smart people in our field work for us." (Chesbrough, 2003a, p.26)

"External R&D can create significant value, internal R&D is needed to claim some portion of value." (Chesbrough, 2003a, p.26)

"If we make the best use of internal and external ideas, we will win." (Chesbrough, 2003a, p.26)

In line with the model of the “Three Markets” (Allaire & Firsirotu, 2004, p.14)
CHAPTER 5. THE GENESIS OF THE BUSINESS ECOSYSTEM CONCEPT

In this chapter I discuss the genesis of the business ecosystem concept. To do this, I first analyze the main understanding elements, its theoretical roots, as well as characterizing the competitive dynamics. Finally, I will address the limitations that may emerge after the analogical relationship built between the business ecosystem and its biological counterpart. In addition to the above, I will describe the evolution of innovation systems by emphasizing the industrial centers effects on the business innovation practices, as well as the emergence of new innovation context following the advent of several factors including the markets globalization, access to knowledge worldwide, the ease of electronic exchanges and more.

The business ecosystem concept is still relatively new and not widely mobilized in the academic literature. However the managers, themselves, have rapidly adopted this concept but with a rather reductionist confined to the wider environment of the company, its customers and partners, without necessarily understanding the underlying logic and implications policy associated with the dynamic innovation. In this part, I will highlight the main features of a business ecosystem.

5.1. UNDERSTANDING ELEMENTS OF BUSINESS ECOSYSTEMS

The American author James Moore in his book entitled The Death of Competition was the first to implement the ecosystem concept to business: "A company be viewed not as a member of a single industry but as part of a business ecosystem that crosses a variety of industries". (Moore, 1993, p.179)

Although mentioned by some authors, a precise definition is still lacking. In what
Open Innovation in Business Ecosystem

follows, I discuss a number of definitions proposed by several authors to extract far more fundamental theories, which are based on the study of this concept.

In The Death of Competition, Moore (1993, p.26) describes a business ecosystem as "An economic community supported by a foundation of interacting organizations and individuals—the organisms of the business world. The economic community produces goods and services of value to customers who are members of the ecosystem. The member organisms also include suppliers, lead producers, competitors, and other stakeholders. Over time, they coevolved their capabilities and roles, and tend to align themselves with the directions set by one or more central companies. Those companies holding leadership roles may change over time, but the function of ecosystem leader is valued by the community because it enables members to move toward shared visions to align their investments, and to find mutually supportive roles”.

Figure 5.1 clearly illustrates the various actors described earlier by Moore (1996, p.28):

**Figure 5.1. The business ecosystem virtuous circle (Moore, 1996, p.28)**

![Diagram](image)

Thus, the author highlights the importance of the notion of community to the extent that, in a business ecosystem, this community will link heterogeneous firms on the basis of one or more core capabilities. Such heterogeneity implies, among other things, the convergence of a variety of industries. The smartphone is a perfect example since the device performs functions previously reserved to a computer, camera, TV or audio device (Rabeau, 2008, p. 64).

It thus appears that the concept of industry is losing its effectiveness against the concept of ecosystem. According to Moore (1996, p.42): "We are witnessing the end of the industry, not as an economic phenomenon but rather as an effective concept to observe major changes in the business world."

Add to this idea the importance of the principle of coevolution mentioned by the author, a major importance principle explaining the dynamics inherent in a business ecosystem and meaning that we can not understand the evolution phenomenon of a business without incorporating changes of other companies in its environment (Torres-Blay, 2003, p.13). In the following sections, I will try to deepen my analysis vis-à-vis this principle.

Inspired by Moore, Torres-Blay (2000, p.5) defines a business ecosystem as “a heterogeneous coalition of companies within different sectors and forming a strategic community of interests or values in network structured around a leader who manages to impose or to share its design or its commercial technology standard”.

From this definition, the author substitutes the word "Coalition" to the notion of community proposed by Moore to highlight the partnership nature that dominates relations between firms in a same ecosystem. These partnerships have their origin in another concept characterizing the business ecosystem, i.e. the interconnectedness between stakeholders. Such a notion is crucial to highlight issues related to innovation policy within a business ecosystem, insofar as, being in such a context, the leaders of a company are required to coordinate an innovation flow from a large number of
Open Innovation in Business Ecosystem

contributors from several markets and hierarchies (Moore, 2005, p.2). Specifically, it is not enough to penetrate the market with innovations from only the internal environment of the company and it is more important to share information with partners and build on them in the innovation process.

Indeed, Iansiti and Levien (2004, p.3) argue that individual strategies of a company have no effect if the success depends on the collective performance of organizations that influence creation and marketing of its products. In such cases, the strategies to be adopted by the company must be qualified as collective strategies.

Instead of proposing a concrete definition of a business ecosystem, both authors are based on the analogy effect linking the business ecosystem to its biological counterpart. As a result, several common features between the two ecosystems deserve to be highlighted:

- In both contexts, we find a large number of participants not only interconnected but also interdependent and those participants share both their effectiveness and survival;
- Members of the ecosystem, regardless of their power, cannot escape the impacts that may accompany relentless relationships linking with other members;
- Within each ecosystem are "keystones" (key participants) that manage to maintain the good performance of the entire ecosystem.

Besides the features mentioned above, Iansiti and Levien (2004, p.9) believe that a business ecosystem could include, for example, firms in which the company outsources business processes, institutions providing company finance, and other technologies needed to guarantee a good continuity in its activities, as well as manufacturers of complementary products. The ecosystem may even include company's competitors as well as customers whose behavior is likely to influence the business performance.

Finally, Peltoniemi and Vuori (2005, p.13) define the business ecosystem as a dynamic structure consisting of interconnected organizations populations, which are small
businesses, large companies, universities, research centers, public sector organizations or other parties that influence the system.

Characteristics and issues of a business ecosystem

At the end of this section, I will try firstly to summarize as clearly as possible the characteristics associated with a business ecosystem, while I will find out other issues likely to support companies operating at the within such a structure.

The characteristics of a business ecosystem

Gueguen and Boucher (2007, pp.6-18) identify the following characteristics as dominant in business ecosystems:

- Several companies use a standard, norm or know-how. This will help to develop one or more core competencies.
- Companies using these skills will be a common strategic destiny on the principle of coevolution.
- One (or more) company will play the leading role. This company will develop a vision shared by other members of the business ecosystem. Founded on the basis of contributions and critical embedded (Moore, 1996, p.54), the leader power will guide the evolution of core competencies. The leading position is evolutionary and its behavior is important in the business ecosystem.
- Stakeholders composing business ecosystems are heterogeneous (companies, institutions, trade unions, pressure groups, etc).
- The business ecosystem stakeholders come from different industries. We are thus witnessing a convergence of industries.
- There is not necessarily an exclusive membership to one business ecosystem.
- Significant competitive processes drive business ecosystems, both intra-ecosystem (to acquire the leading position) than at inter-ecosystems (competition in several business
Open Innovation in Business Ecosystem

ecosystems). A business ecosystem involves both cooperation and competition, which corresponds to the logic of "Coopetition."

The figure 5.2. proposed by Peltoniemi (2005, p.64) schematizes clearly all relevant features listed above:

Figure 5.2. Business ecosystem characteristics (Peltoniemi, 2005, p.64)


Issues related to the concept of business ecosystem

Through the literature review consulted above, we have identified a multitude of features and concepts whose impact on the innovation management by the company is decisive. We recognize however that it faces many challenges, challenges that I present below.
Challenge 1. The coevolution principle

The first challenge concerns the nature of the strategies that must adopt a company in its ecosystem. Indeed, in such a lattice environment, individual decisions will be less important than collective decisions (Torres-Blay and Gueguen, 2003, p.9), implying a decline in individual strategies to face the pressure of collective strategies. Thus, the company, as well as other parts of its ecosystem, is led to "co-evolutes" collegially, knowing that such a process could also lead to closer collaborative relationships than conflicts (Moore, 1996, p.33).

Challenge 2. New avenues of innovation

The second challenge, meanwhile, is somehow a consequence of the first challenge. This effect relates to the innovation policy of the company in its ecosystem. In terms of innovation, success of the company in this context now depends on its ability to closely monitor its network of partners and potential customers (Adner, 2006, p.1). This leads us to introduce the concept of open innovation that reflects this new reality.

Challenge 3. Leadership within the business ecosystem

We also note the preponderance of the leadership notion in a business ecosystem, since the stability of this ecosystem depends critically on the performance of one leader in particular. As an example, consider the case of IBM in the mid 80s. According to Moore (1993, p.60), this company has managed to create an entirely new community of work-based personal computers, which had the effect of bringing all the players circling the company to pay its technical standards and manufacturing processes.

It should here be mentioned that being a leader of a business ecosystem requires the existence of an electronic platform likely to attract many participants around the company, and this, to strengthen the potential for creating value within the ecosystem.
Challenge 4. The risks associated with business ecosystem context

Although the fact of succeeding in managing the assets out of reach allows the company to monopolize any competitive advantage over its rivals (Iansiti and Levien, 2004, p.22), it appears that its success now rests on its ability to manage risks associated with its operations within the business ecosystem (Adner, 2006, p.2). Indeed, the role of leaders is no longer limited to determining the market and targets performance, but rather to identify the risks inherent in their actions. According to Adner (2006, p.3), the co-innovation risk (related to coordination with co-innovators), the execution risks (associated with project execution) and the adoption chain risks (related to operations management within the value chain) are all variables that must have a careful examination by the leaders. This exercise is a major importance since it could lead managers to review the actions taken since their beginning, or even change their innovation strategy.

Finally, the presentation of all features related to the strategy of business ecosystem, and the key challenges associated with it, allowed us to deepen the concept analysis.

5.2. The competitive dynamics within business ecosystems

5.2.1. The co-evolution principle

The co-evolution principle is crucial in explaining the competitive dynamics within the business ecosystem. At the beginning of this section, I briefly explain the theoretical roots of this principle. I then will look more closely the relevance of this process in the business ecosystem. To better clarify this concept, two relevant examples of coevolution are finally processed.

5.2.1.1. Co-evolution in the business ecosystem

Many researchers, including Kauffman, Nelson, and Ziman believe that developing co-
evolution models is a necessary exercise to successfully understand the dynamics associated with industrial change (Murmann, 2003, p.21).

According to Moore (1993, p.76), the co-evolution process helps to strengthen the innovation efforts of firms in the same business ecosystem. These must indeed "co-evolve" their efforts to promote a new innovation: they therefore act in both cooperation and competition to promote new products, satisfy customers and adopt new innovations to market.

Furthermore, this process is playing the role of contributor between an organization and its environment composed of other organizations and its broader context. According to Peltoniemi (2005, pp.3-4), several conditions must be met so that there is coevolution. They are summarized as follows:

1 - A limited number of customers encouraging enterprises to change and evolve.
2 - A conscious choice focusing business to change.
3 - Interconnectivity between organizations allowing them to have a reciprocal effect on each other.
4 - A feedback process reinforcing the co-evolution effects.

The Figure below neatly summarizes the comments made by the author:
Open Innovation in Business Ecosystem

**Figure 5.3. The co-evolution in the business ecosystem (Peltoniemi, 2005, p.35)**

![Diagram of co-evolution in the business ecosystem](image)


In their book “The Keystone Advantage”, Iansiti and Levien (2004, p.26) use the concept of "Shared Fate" to illustrate the relevance of co-evolution process described above. The authors, however, use this notion under a critical eye insofar the interconnections between communities forming the ecosystem could induce the whole system into a spiral of errors and miscalculations, which is likely to spread all these malfunctions to other actors.

### 5.2.1.2. Examples of coevolution

**Example. Application development in the Mobile Operating System**

In the field of Mobile Operating System, developers need access to Application Programming Interfaces (APIs) and other characteristics of the platform to create applications, which will be valued by users of smartphones. Beyond this, demand-coordinators may also be related to cost-minimizes (Evans & Schmalensee, 2007, p.34)
since - in addition to facilitating access to the platform - they make available to a group of actors the tools to increase their productivity. Thus, the Software Development Kit (SDK), others software libraries and other resources are made available to developers in order to facilitate their works and encourage them to invest in the development of the platform. The more there will be to join the platform, the more the potential value that can be delivered to customers will be important, and with it the business ecosystem.

Eisenmann et al. (2007, pp.92-93) distinguish "proprietary platforms" where one player controls the technology developed (e.g. Apple iOS 4 that the iPhone uses) and "shared platforms" where several companies collaborate and develop technology while competing to offer consumers different but compatible versions of the platform (e.g. the different distributions of Linux, or Google Android through the Open Handset Alliance).

5.2.2. Coopetition

Although co-evolve means that players in the business ecosystem must act in cooperation and competition (Moore, 1993, p.61), we must also recognize that this process is based more on a partnership approach (Torres-Blay and Gueguen, 2003, p.11).

The coopetition concept, unanimously defined as "a situation of cooperation and competition" (Baumard, 2007; Branderburger and Nalebuff, 1996), allows coopetition to combine these two antagonisms (cooperation and competition) within a single process (Boucher and Gueguen, 2004, p.3). According to them, the development of the business ecosystem is made first and mostly on the strength of cooperation, before experiencing a new dynamic through coopetition. In a third step, these two approaches simultaneously fueling the development of the business ecosystem.

For Hamel, Doz and Prahalad (1989, p.134), the interest of coopetition lies in learning and knowledge creation, which will be embodied in new products or services of a firm.

I recognize that consideration of this concept got a considerable importance in studying the subject of my research, since it stems from the open innovation process.
Indeed, firms forced to "coopete" must not only adapt to a hyper-competitive world by adopting competitive postures, but they must also carry out collective strategies to counter other competitors or to pool resources and share knowledge (Lado, Boyd and Hanlon, 1997, pp.23-25).

Some observers believe, however this concept as rather paradoxical (Schmiele and Sofka, 2007, p.7), especially when firms operate in an international context where multiple barriers including cultural, regulatory or trust would increase the risk associated with the sharing of Intellectual Property (IP) rights. The international context is in fact likely to add uncertainty to the coopetition process, which would encourage firms to protect themselves through several practices that we will discover later.

5.2.3. Electronic platforms: shared values and leadership within the business ecosystem

I propose in this section, to scrutinize the role of electronic platforms in order to explain as clearly as possible the competitive dynamics within the business ecosystem and, above all, to foreground the various challenges associated to the value and leadership sharing identified above.

It is important first to identify the main factors that contributed to the emergence of electronic platforms, and their use by a few dominant firms in a business ecosystem.

5.2.3.1. What is an electronic platform?

Attempt here to explain what is an electronic platform. According Iansiti and Levien (2004, p.148), electronic platforms represent an indispensable structure for the value sharing by all members within the business ecosystem.

Both authors also argue that a platform offers the ability to embed shared solutions in order to solve common problems found in the business ecosystem.
Eisenmann et al (2006, p.93) define a platform as follows:

“A platform embodies an architecture—a design for products, services, and infrastructure facilitating network users’ interactions—plus a set of rules; that is, the protocols, rights, and pricing terms that govern transactions”.

Thus, from this definition, it seems clear that network effects give to the notion of platform its entire glow. The majority of competitive struggles occurred in several areas including operating systems, online recruitment services, search engines or video games are clearly based on these effects, with as result a limited number of actors that have succeeded in establishing itself, which are among many competitors in a given field (Rabeau, 2006, p.55).

Gawer and Cusumano (2008, p.13) indicate, however, that to build a platform around a product or around any technology requires two specific conditions that are presented as follows:

1-The platform must perform at least one essential function according to the fact that it can be described as a "System of use", or solve a critical technology in an industry.

2-It must also allow members to connect easily, offer the possibility to expand the "system of use" by the construction of new features, just as it must accept new contributions from its members.

5.2.3.2. ICT platforms and the challenge of leadership

In his book entitled ‘The Death of Competition’, Moore (1993; 1996) states that the business ecosystem is experiencing a life cycle through four major stages of development marked by phases of stability and instability: birth stage, expansion stage, leadership stage and self-renewal (or death) stage.

At the third stage, the notion of leadership is here all its light. At this level, a leader emerged in the business ecosystem and provides the function to add value to the community of players around him. To do this, he encourages them to act in a common vision to adapt their investments and find mutual support roles.
Protocols, standards and communication standards must then necessarily be compatible and the most universal possible. Indeed, leadership is often based on technology standardization process (Torres-Blay and Gueguen, 2003, p.11).

However, Moore's approach, although it was appropriate to put forward the leadership challenge in the business ecosystem, does not result in an extensive and rigorous analysis of the relationship between the leader power and the build of a platform capable of managing the contributions of different actors.

Citing clear examples of Wal-Mart (with its electronic platform named Retail-Link) and Microsoft (with its Windows operating system), Iansiti and Levien (2004, p.114) indeed show that the stability of the business ecosystem is closely related to the role played by some key participants, called "Keystones". They are able to enjoy a remarkable power, power delivered through an electronic platform on which the whole system.

In the same vein, (Gawer and Cusumano, 2002, p.32), in their book “Leadership Platform”, specify that being leader of an electronic platform can exert considerable influence on the trajectory of innovation in the industry and, ultimately, on the formed network of business ecosystems and customers producing and using “complements”.

To clarify my explanations and to make them more concrete, I propose to consider briefly the case of Google business. According to Iyer and Davenport (2008, p.61), two attributes make the success of this company: its high performance search engine and its technological infrastructure, which acts as a platform capable to increase, for the company, network effects.

Through this platform, the company has indeed a "Keystone" in its business ecosystem comprised of various stakeholders, namely:

- Advertisers (companies and individuals):
  - Constitute a very important source of revenue for Google;
  - Provide content that attracts more customers.

- Customers:
  - Seek information and feel their interests;
- Use targets-Ads;
- Test the innovations performance and quality available on the network;
- Help by contributing ideas and suggesting improvements.

• Content providers (media companies and individuals):
  - Create the information;
  - Stimulate customers’ interests and encourage the formation of user communities around their offers.

• Innovators (independent software sellers, Google engineers, "Open Source" communities):
  - Form together a diverse network of product development;
  - Develop new offers fostering, on the one hand, customer engagement and, secondly, encouraging Google to remain "attached" to their offering;
  - Generate income both for them and for Google;
  - Extend the tools and technologies value of Google.

Following the example above, it seems clear that Google’s technology infrastructure, in this reticular environment, can manage all the contributions from several players, to consolidate its leadership in several areas (including online advertising and the development of Internet applications) and, more importantly, to share the value with all the actors presented above.

5.3. BUSINESS ECOSYSTEM AND OPEN INNOVATION

As it was demonstrated above, the business ecosystem development is characterized by collective innovation and "open" logics involving several companies with different skills and complementary. The analysis of different stages of the life cycle of an ecosystem clearly shows that the Keystone at the origin of an innovation will soon need allies that could contribute to the development and diffusion of its new product or service (Moore,
As we have seen, platforms allow the exploitation of indirect network externalities that contribute to the supply pin carried by the firm and its partners.

Moore's analysis (1996, pp.24-58) of various phases of development of an ecosystem is actually an open innovation strategy to Chesbrough (2011, p.33), innovation strategy supported by ICT, including platforms. To Chesbrough (2003a, p.12), companies must move from a closed innovation model in which they drive their own R&D and commercialization of new products/services, to an open model using available sources of innovation in their environment (outside-in) and valuing the best output from their own R&D (inside-out). The open innovation concept therefore highlights the increasing role of external sources of innovation as opposed to only internal resources, and the particular capabilities of companies R&D. Chesbrough make from "openness" a way for companies to optimize their innovation process and exploit new business opportunities.

In his latest book, Chesbrough (2011, pp.61-65) also clearly recognizes the role of platforms in open innovation. By opening its platform, the Keystone can integrate contributions of different partners and thus support the business ecosystem development. It is through the platform that the Keystone will integrate its business model – i.e. resources – to its partners: "One important device that enables this integration of business models throughout an ecosystem of suppliers, customers, partners and collaborators is the ability of the company to establish its technologies as the basis for a platform of innovation for that ecosystem"(Chesbrough, 2011, p.64).

The implementation of an open innovation strategy does not mean that we should erase internal R&D, but this internal process will generally be reserved for the core business, the one on which the company has a significant market power and which is generally used as a lever to develop on another side of the market through a platform strategy. This platform strategy may be a part of an inside out logic, which will allow to the platform owner:

- To capture part of the value within the business ecosystem through the exploitation of intellectual property rights (including licensing), thus ensuring a certain degree of control.
- To contribute to the development of an “ecosystemical” competency (the other members of the ecosystem can use the leader technology and thus ensure its diffusion while creating value for themselves).

- To reduce uncertainty by introducing switching costs that will sustain the business ecosystem, especially in view of inter-ecosystem competition.

The business ecosystem development is clearly based on logic of collective innovation and open in which different types of resources or ideas are shared among members of this business ecosystem. This innovation logic is in many cases brought by the Keystone/platform owner and usually results in the platform implementation, which aims to share resources and coordinate the actors (Chesbrough, 2011, p.62). Many are companies that use such platforms to support their innovation and explore/exploit their business ecosystem. If these platforms often involve phase of ideation in the innovation process (Dell’s IdeaStorm or IBM with IBM IdeaJam) they also may involve the stages further down the processes which are then marked by the seal of "co": co-conception, co-design, co-production, co-branding ... In any case, the Keystone must increase the innovation process efficiency that this Keystone drives while giving to its partners the means to consolidate their position in the business ecosystem and ensure its continuity.

There is now a large number of practices using open innovation and are manipulated through platforms. Following Phillips (2011, p.43) we can consider two important dimensions of the open innovation process (particularly in the ideation phase):

- Who is responsible for or submitting the idea? Some companies are opening at this stage a large number of participants (crowdsourcing); others on the contrary, limit the number of participants in a small group of experts working on a specific issue.

- How is done the selection of topics or themes of innovation? In some cases businesses open widely the themes of reflection in others, the themes are set and linked to a specific problem or issue.

Thus, in many cases, the platforms are mobilized to drain, collect, analyze and filter ideas that represent potential sources of value for companies (IBM, Dell, etc). So this is good for these companies to exploit their business ecosystem. The choice whether to
Open Innovation in Business Ecosystem

initiate the ideation process depends on the objective of the company. It may be exploring a new area or conversely concentrate on a narrower scope in enhancing its knowledge bas and patent base. The approach can be completely open and apply to a wide audience or rather to relate to a more limited audience of specialists. While some companies develop their own platform to support their open innovation, others in contrast, rely on "innommediaries" (Sawhney et al, 2003, pp.126-128), which provide them with the entire collaboration infrastructure necessary. The development and role of these intermediates are not neutral and requires from companies to proactively manage their intellectual property, have a greater attention to external technological developments and requires significant organizational changes to support the process. This last point confirms the position of Lichtenthaler and Holger (2008, pp.14-25) for which the limitations associated with the use of these collaboration platforms are not so much related to the technology itself, as governance structures supposed to drive and institutionalize the device established.

The business ecosystem concept emphasizes the need for companies to build an extensive network of partners that will enable them to innovate faster, at lower cost while enhancing their tangible and intangible assets. The business ecosystem approach provides a framework for analyzing the innovation process particularly interesting group which takes into account the variety of inter-firm relations (cooperation, competition, coopetition), business models, skills mobilized, built and reconstructed through the innovation process, including the role of platforms. In this sense, the approach allows the business ecosystem to put into perspective the open innovation phenomenon.
CHAPTER 6. THE LINK, OPEN INNOVATION

The open innovation concept was promoted by Henry Chesbrough, professor and director of the Center for Open Innovation at Berkeley, California, and popularized through his book “Open Innovation - The New Imperative for Creating and Profiting from Technology”, published in October 2003.

The open innovation paradigm has set in motion once the innovation strategies adopted by companies in the 20th century. At that time, according to Chesbrough (2003a, p.8), companies were spending most of their R&D budget in internal activities, recruiting the best candidates to attend these activities and accounted for a large part to the steps for creating value in order to promote their own ideas. Thus, following this approach or the closed innovation model, they seek firstly to erect barriers to entry facing potential competitors and, secondly, to achieve independence or "Self Reliance" vis-à-vis their networks of partners and suppliers (Chesbrough, 2003a, p.35).

Under this new innovation logic, firms are now able to market not only their own ideas, but also ideas and technologies from outside. Chesbrough (2003a, p.14) defines the open innovation process as follows:

"The use of purposive inflows and outflows of knowledge to accelerate internal innovation, and expand the markets for external use of innovation, respectively. Open Innovation is a paradigm that assumes that firms can and should use external ideas as well as internal ideas, and internal and external paths to market, as the firms look to advance their technology".

Thus, from this definition, it seems clear that the open innovation process is to consider that it is the network or chain of employees, which is the source of innovation rather than a particular company (Rabeau, 2007, p.9).

Figure 6.1 summarizes clearly the explanations above:
Open Innovation in Business Ecosystem

Figure 6.1. Closed innovation vs. Open innovation (Chesbrough, 2006, p.47)


For West and Callgher (2006, p.2), open innovation in fact, encourages the exploration of a wide range of internal and external sources that may constitute innovation opportunities for the company. Furthermore, this paradigm allows the integration of these explorations with internal resources and capabilities of the company, just as the paradigm uses this opportunity as widely as possible, and, through several channels.

According to Henkel (2006, pp.133-139), the concept of openness in the innovation process of firms goes beyond the traditional relations of exchange taking place in markets where the technologies are considered as simple goods to be purchased or sold on the market under favorable conditions. To instill the notion of openness, the author quotes the example of the development of the Linux software source code. Under this new logic, Henkel asserts that companies are now able to share their technology with the public to encourage the development of possible collaborations.

Leadbeater (2007) proposes a distinction between two open innovation modes: he means well by the term "Open Innovation IN is the basic model where ideas flow into companies from different sources (Crowdsourcing)". This mode "IN" provides
organizations with a wide network of talent and ideas on which they could rely for their innovations. Several companies cited by the author, like Goldcorp and Procter & Gamble, are striking examples of this innovation model.

On the other hand, using the term "Open Innovation OUT", the author implies a model “where a group of people, a movement, sometimes a company, create a kernel or a platform, with some tools, onto which people can add their ideas and contributions (Open Source Software)”. Several companies, like Wikipedia and Linux (mentioned above) practice this innovation model. This brings us also put into perspective the relevance of the role of electronic platforms in the innovation strategy of a company.

On this side, Chesbrough (2009, pp.68-76) defines two open innovation modes. The first is to maximize the use of solutions developed externally ("outside-in"), so an openness to external competencies and the second to monetize technology developed internally, which cannot find applications for the company core business ("inside-out ") or to be more precise, an intellectual property optimization.

To summarize, West et al (2006 p.283) state that open innovation is "both a set of practices for profiting from innovation and a cognitive model for creating, interpreting and researching those practices". In such an environment, the boundaries of the firm tend to fade, to ease the penetration of new ideas and technologies.

Finally, to get a more concise open innovation concept, I propose below to further explore the main determinants contributing to the building of this new innovation context.

6.1. Determinants of Open Innovation

As mentioned previously, the literature identifies several factors that have helped change the innovation concept in which companies operate. In a report, OECD (2008) attests that globalization is a major determinant of the more open innovation process, not only because it means greater and more global competition, but also because it creates a more comprehensive landscape for innovation.
Open Innovation in Business Ecosystem

In his book entitled "The New Imperative for Creating and Profiting from Technology", Chesbrough (2003a, pp. 45-57) identifies several factors that would encourage firms to commit to an open innovation process. The table below summarizes these determinants clearly:

Table 6.1. The main determinants of open innovation (Chesbrough, 2003a, pp.45-57)

<table>
<thead>
<tr>
<th>DETERMINANTS</th>
<th>MAIN ASPECTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Useful knowledge has become widely distributed</td>
<td>• A relevant change towards an economy based on knowledge</td>
</tr>
<tr>
<td></td>
<td>• Broadening the knowledge scope of business</td>
</tr>
<tr>
<td>2. Not used ideas may be lost</td>
<td>• Research ideas are placed &quot;on the shelf&quot; until development teams are ready to work on it</td>
</tr>
<tr>
<td>3. Idea value or technology depends on the business model</td>
<td>• Economic value of a technology remains latent until it is marketed in an open business model</td>
</tr>
<tr>
<td>4. Presence of venture capital modifies the innovation process</td>
<td>• Corporate venture capital and startups funds are considered as an integral part of the field of innovation</td>
</tr>
<tr>
<td>5. Firms should be buyers and sellers of IP assets</td>
<td>• IP is an integral part of the technology strategy, and its management must be done at a strategic level of society</td>
</tr>
</tbody>
</table>

All the above factors thus create the new open innovation logic, which embraces external ideas and knowledge in accordance with the internal processes of internal R&D (Chesbrough, 2003a, p.45).

6.2. The advent of new business models for innovation

Following what has been mentioned, it seems clear that the major benefit of open innovation for companies is to provide a broader base for ideas and technologies (OECD, 2008, p.2).

Achieve benefit from these resources, however, requires the establishment of a rich portfolio in terms of practices and modes of innovation that can ensure both the transfer of this knowledge to companies and their development in the outside. In other words, in this context, companies must constantly reconfigure their business models to ensure continuous efforts in innovation.

According Rabeau and Ben Letaifa (2004, p.55), technological changes that occurred during the last decade are the source of a deep transformation of business models. Companies without legacy as Dell Computer, has indeed immediately adopted new ways of doing, which, in varying degrees depending on sectors and countries, are becoming dominant business model (Rabeau, 2007, p.9). The added value chain, electronically integrated, matches (in a partnership information) all elements of the added value chain, since the customer to the latest provider (Rabeau, 2000, p.12).

For the author, these new ways of changing the innovation process and allow the emergence of new opportunities that can generate value. Consequently, many value creation engines associated with innovation are emerging. We transcribe the following:

- A first convergence of technologies and industries around these new business models;
- A second convergence touches key customers worldwide who demand products comparable and interchangeable;
- A final convergence that refers to the roles of businesses worldwide.
Open Innovation in Business Ecosystem

These three convergences are transforming the innovation process and, by extension, how to proceed in R&D.

Rabeau (2008, p.76) asserts that the innovative capacity of firms tends to move from an area of traditional innovation -that describes a context in which innovation is usually technological in nature- to a new universe, as the author refers to as "the universe coming from the experience of innovation."

In moving towards this new world as well, the market tends to become more global and interdependent. This new environment constituted of "co-creation" experiences therefore requires that firms expand their value creation space by involving more or less all stakeholders of the value chain (customers, suppliers, partners networks and academic units for research and development).

The choice of an appropriate business model plays a key role in positioning the firm in this new world, and by accelerating the generation of an innovation portfolio that is profitable for the firm. IBM, for example, has successfully transformed its business model by creating the business unit "IBM Global Services," which assembles solutions from its products and those of its competitors in the goal to provide the best possible value for the customer throughout the world.

To Chesbrough (2007, p.27), IBM offers a compelling example of a firm that has managed to reconfigure its business model by making it more "open". This notion of opening coincides indeed with an environment where R&D costs are high, and while the product life cycle is shortened. Chesbrough, that distinguishes the business model with two basic functions create and capture value, also states that companies should experiment with creative ways to open their business models. To do this, they must see to use external ideas and technologies in the internal development of their products, and they should allow the internal IP to be marketed externally. Figure 6.2 schematizes clearly this new paradigm.
Finally, just to take advantage of external knowledge in their network, it seems essential for companies to combine different approaches to innovation. In the next section I will try to explain as clearly as possible the different methods used by companies in the context of open innovation.

Figure 6.2. Closed business model vs. Open business model (Chesbrough, 2007, p.27)

6.3. THE OPEN INNOVATION PRACTICES

In its 2004 report, the European Industrial Research Management Association identifies several open innovation modes as they apply to technology and enterprise markets. The matrix below describes the various modes adopted by companies in the context of open innovation.

Table 6.2. Open innovation modes: Technology & Markets (EIRMA, 2004, p.24)

<table>
<thead>
<tr>
<th>Markets</th>
<th>Unfamiliar</th>
<th>Strategic</th>
<th>Non Strategic</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Joint venture</td>
<td>Venture capital</td>
<td>Spin off</td>
</tr>
<tr>
<td>R&amp;D Contact</td>
<td>Internal venture fund</td>
<td>Sale</td>
<td></td>
</tr>
<tr>
<td>Non strategic</td>
<td>Joint development</td>
<td>Licensing</td>
<td>Venture capital</td>
</tr>
<tr>
<td>Development</td>
<td>Acquisition</td>
<td>Internal venture fund</td>
<td></td>
</tr>
<tr>
<td>Strategic</td>
<td>Acquisition</td>
<td>Internal development</td>
<td>Joint venture</td>
</tr>
<tr>
<td></td>
<td>Licensing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strategic</td>
<td>Spin in</td>
<td>Acquisition</td>
<td>R&amp;D contract</td>
</tr>
</tbody>
</table>

According to the EIRMA (2004, p.28), internal development and acquisition practices are typically implemented in technologies and markets that are strategic nature for the company. In such a case, open innovation and collaboration with external partners can indeed be risky for the long-term success of the company.

When it is about non-strategic technology and markets, licensing or equity practices remain the preferred means by companies.

To summarize, the OECD (2008, p.52) identifies two models used in business: partnerships with third parties through alliances, joint ventures and co-developments,
as well as the knowledge acquisition or sale by the R&D through contract, or licensing purchases/sales.

Other approaches, such as venture capital operations, equity investments in "young shoots" from universities or in investment funds from venture capital have become new pathways taken by companies. The nature of objectives set by those companies – strategic or financial – and the link nature -narrow or remote- existing between the activities of those companies and those start-ups therefore generate several investment options (Chesbrough 2002, p.55).

Some companies “addict” to open approach could effectively, for example, support the creation of start-ups by investing during their launching in some experiments or, later, by partnering and engaging in alliances (Chesbrough, 2003b, p.35). These practices of “Spinning in” can allow companies to grow, in the future, their market penetration to access to new markets, or respond to competitive threats related to their existing businesses and technologies portfolio.

Note, however, that this practice also concerns universities, which research activities may be relevant with innovative companies. Rabeau (2008, p.78) supports the idea that the support for universities (e.g. to enable them to offer various programs for the innovation management for high-level executives) is one way among others to stimulate innovation. Wright (2008, p.80) for his part defends the idea that universities are well suited to fulfill the external need of companies in terms of new skills, new ways of thinking, or new platforms to deal with complex issues for firms.

In addition to the Spin In, some companies choose to practice external spinning (“Spin Off”), which is to invest in start-ups whose activity is closely linked to the one of the company but offers little in terms of strategic perspectives (Chesbrough, 2002, p.55). According to Rabeau (2008, p.83), sometimes the company invests in a research team and finances it initially in order to develop new research. In the case of a research progression, the technology development thus reaches a more advanced stage. To financially support the project and develop a business plan, the company will then use various partners, or even to venture capital companies. The prototype in place, it is then tested by an expert panel to assess the validity of the researches. If necessary, the company may decide to refinance research to facilitate the transition to commercialization.
Open Innovation in Business Ecosystem

Finally, to combine different innovation practices is a necessary exercise for companies wishing to excel in the open innovation context described above. The following section provides an overview of the main advantages and limitations associated with the mode of open innovation.

6.4. ADVANTAGES AND LIMITATIONS OF OPEN INNOVATION

6.4.1 Advantages

At the end of this section, we will make an overview of the main advantages and limitations of open innovation, as identified from the literature consulted.

According to OECD (2008, p.40), one of the most obvious benefits of open innovation is the largest base of ideas and technologies available from which a company could extract and strengthening both innovation internal and growth.

For Docherty (2006), open innovation ensures a leverage of R&D conducted outside the company. It also offers the opportunity to focalize again some internal resources on the discovery, the selection ("screening") and the implantation management. This new paradigm can also provide internal groups with a greater sense of urgency to act on ideas or technology. According to the author, there are other benefits such as improving the return on internal R&D activities through licenses sales or transfers for unused IP, or the ability to conduct strategic experiments with less risk and fewer resources in order to protect and extend the core business of the company.

In a study, Vanhaverbeke et al (2008, pp.253-254) attempted to assess the benefits of emission practices of companies (i.e. do "Corporate Venturing") as a particular mechanism of open innovation according to a real options perspective. According to the authors, the open innovation approach allows innovative companies to take advantage of the first participation in new technologies or business opportunities. Secondly, innovative companies are able to delay their financial commitment by taking advantage of a greater flexibility regarding the timing where the internal part of the innovation
process must be initiated. Thirdly, open innovation provides to companies the advantage of leaving the market quickly, to avoid additional losses as well as the ability to realize some value from projects not being fed internally. Finally, as mentioned above, spins off practices allow companies to control the development of units created outside the company while delaying the decision to exit.

Other benefits (including reducing the risk of a research project) are fundamental to the follower companies of this new business paradigm. In choosing among the open innovation approaches presented above, companies are able in effect to reduce expenses to be allocated to the research project, but they also manage to reduce the labor necessary for its implementation (Rae, 2008).

6.4.2 Limitations

Despite these advantages, several limitations may arise in the context of open innovation. According to Rabeau (2007, p.9), the major problem with this paradigm is the protection of the company IP. The OECD (2008, p.60) asserts that the increased leakage risk of corporate knowledge means that knowledge can only be revealed to external partners, who can possibly compete with or worse, use wisely the results obtained by the business or its know-how.

Company’ followers of open innovation also face challenges mainly associated with the management of their international activities. According to Schmiele and Sofka (2007, p.14), working with international partners not only exposes companies to a culturally complex knowledge, but it also increases uncertainty. For Newman and Stanley (1996, pp.753-779), choose management practices based on local culture of the country is a major factor to strengthen the management practices of leaders working in different contexts.

Ghemawat (2001, pp.137-146) asserts that the distance between businesses from their international partners take a cultural dimension that adds to other dimensions of an administrative, political or economic nature, which can make foreign markets considerably less attractive.
Other aspects of complexity accompany the firms operations in the context of open innovation, including confidence in international trading relationships. In the eyes of Zaheer and Zaheer (2006, p.28), this dimension is particularly important, especially when collaboration between international partners comes from asymmetric trust contexts. According to the authors, these international partners bring with them different behaviors and motivations. It therefore seems inevitable that legal issues arise in these business models. Firms can also estimate that it’s well worth the trouble, instead of being downgraded by major innovations affecting their market (Rabeau, 2008, p.54). These problems are also with companies seeking to protect their creations in several jurisdictions because the IP rights are specific to a particular country, or geographically plotted in a limited territory, the European Community, for example (Greenhalgh and Rogers, 2007, p.542).

To sum up, the literature on cooperation, collaboration and alliances shows various disadvantages such as additional costs associated with managing cooperative relationships with external partners, the lack of control, the negative impact on flexibility, the over-dependence to external parties, or the potentially opportunistic behavior of partners (OECD, 2008, p.73).

### 6.5. Conclusion

Based on the literature review, we identified the special characteristic of the business ecosystem concept, since it is an organizational strategy whereby a company is able to improve the management of multiple stakeholders from various industries by different means (coevolution or coopetition). Moreover I have been able discover the relevance of the relationship between a business ecosystem and open innovation.

The open innovation requires an infrastructure - dedicated or not - able to handle the different partners contributions (material or immaterial) inside, but also outside the borders of the companies. ICT platforms are essentially devices that permit to connect, bring together, exchange and share. Thus, their role is fundamental in the development of the open innovation. The fact that the open innovation concept has appeared in a period characterized by a strong interest (both among managers than among
researchers) for collaborations of all kinds and the Internet (Huizingh, 2010, pp.2-9) is not neutral. Development of technologies from the Internet and ICT platforms including greatly facilitated the development of practices and the opening of the innovation process of companies. There is therefore every reason to believe that with the development of ICT, other practices and new forms of open innovation will emerge.

In order to schematize the apparent link between business ecosystem, open innovation and Innovative organization strategy, I propose this scheme (figure 6.3), adapted from the business ecosystem’s characteristics of Peltoniemi (2005, p.64):

Figure 6.3. The ITC platform: relational link between open innovation and organizational strategy on the business ecosystem
CHAPTER 7. EMPIRICAL STUDY: TO WHAT EXTENT THE APP STORE NUMERICAL BUSINESS ECOSYSTEM CAN BE EFFECTIVE IN STEVE JOBS OPEN INNOVATION STRATEGY FOR APPLE?

I want to redevelop my methodology section (Chapter 3) by recalling the points that have guided my case study. This study is not based on a search established by my own way, this is a reconstruction based on several case studies of the company Apple Inc that allows selected data to answer my research problem. Then, this study is based on Steve Jobs leadership in the Apple Company, particularly from the late 90s when the company has grown popular because of him. The aim is to highlight the points raised in the theoretical study and overlaying the data collected on the Apple Company to make the link between theory and practice in order to draw the best conclusions on the issue of search: “How an ecosystem can contribute to open innovation strategies of innovative firms in order to strengthen their competitive position on the market?”

In order to follow the same pattern as my theoretical study, I will start first by explaining how the company Apple is defined as innovative organization, including the strategy set up by Steve Jobs creating its popularization. In a second step, I will put up a "map" identifying key players in the ecosystem of Apple's business, particularly those involved in the proof of the act of open innovation at Apple, so that in a third time I speak of open innovation practices in the business, their advantages and limitations in Apple Inc.

7.1. CONTEXT

To have a better understanding of the case study, and in order to settle it, a quick historic of the Apple Company life, and on its Steve Jobs will help to better understand the situation and the environment in which this firm evolves.
7.1.1. Apple Company

Apple Inc, originally Apple Computer Inc. is an American multinational computer, created on April 3, 1976 in Cupertino, then incorporated as a company January 3, 1977. From its inception the company as it exists today, Apple has experienced various stages of evolution of the computing world, from a world without personal computers in a networked society of the next century through fixed and mobile devices. His story is particularly linked to that of one of its co-founders, Steve Jobs, forced to leave the firm in 1985 and rehired in December 1996, before becoming CEO of the company in 1997. Among the leading products Apple has known since its inception, are the Apple I and II, the Macintosh, iPod, iPhone and the iPad.

Apple has known many successes at it inception, but the entry of Microsoft in the market has almost sunk the company. Since the return of Steve Jobs as the CEO in August 1997, Apple has known many successes. Actually, Apple reached the rank 35 in 2011 according to the fortune 500, a ranking of America’s largest corporations (Fortune 500, 2011), and up 21 slots between 2010 and 2011. It is important to highlight that in 1997, Apple ranked the slot No.150 and losses $816 millions (Fortune 500, 1997).

Today, Apple is considered as the most innovative company since the seventh consecutive year (50 most innovative companies, 2012). These awards are thanks to Steve Jobs, its CEO who has shaped the Apple culture throughout the year. Indeed, as explained very well by Olivier Clodong and Georges Chetochine in their book “Le Storytelling en action”, Steve Jobs and Apple's scriptwriters were able to sell an "Apple way of life", with the iPhone, the MacBook, the iPod, etc. There is an “Apple culture”, a community of fans who think Apple, work Apple, play and communicate Apple.

For this reason I will focus on the period when Steve Jobs ran Apple rather than when the firm was led by professional CEOs (i.e. Sculley, Spindler, Amelio).

Some question emerged: What happened to this firm at the edge of the end? How it became the most innovative US Company? Those questions will find answer in part 7.2. First, let's have a brief look on who is Steve Jobs, and why he was the hero who saved his own company.
7.1.2. Steve Jobs, a “visionary”

The Steve Jobs case, since its coming back as the Apple CEO will deeply help us to understand how this legendary leader has straightened a firm yet at the edge of bankruptcy. This brief history was made thanks to the Walter Isaacson’s Steve Jobs biography, published in 2011.

Steven Paul Jobs, or Steve Jobs, was an American inventor and entrepreneur, widely recognized as a visionary leader and a pioneer of the personal computer revolution. Co-founder, CEO and chairman of the board of Apple Inc, he also directed the Pixar studios and became a member of the board of Disney in 2006 during the takeover of Pixar by Disney.

Steve Jobs, Steve Wozniak and Ronald Wayne established Apple on 1 April 1976 in Cupertino. In early 1980, Steve Jobs convinces the PARC managers to let Apple use the Graphical User Interface (GUI)/mouse technology. According to Steve Wozniak, co-founder of Apple: “He told them directly that they had a great technology, but Apple could make it affordable enough to change the world (Xerox technology cost twice the price Apple could propose it”). It is often said that Jobs had “stolen” the ideas of the PARC by appropriating the concept of graphical interface. According to Isaacson, Jobs has just convinced the leaders of Xerox, who seemed unconcerned about the future of PARC’s interest to let Apple “share” this knowledge. An agreement was also signed, and Xerox invested one million dollars in Apple shares. To resume, Steve Jobs bought the commercial potential of the Xerox PARC work on an innovative technology; this is a good Outside-In example, because this open innovation process led to the design of the famous “Macintosh” in 1984, the first computer to take advantage of these graphical user interface innovations.

After losing a power struggle with Apple CEO John Sculley yet he had recruited, he left the company in September 1985 to found NeXT and do some other businesses.

In early 1997, Apple bought NeXT. This transaction allows Steve Jobs to return as head of the firm he co-founded, and provides the source code of NeXTSTEP from which has developed the operating system Mac OS X (i.e. Outside-In innovation process). He oversaw during fourteen years the creation, development and launch of the iMac, the iPod, iTunes and Apple Store retail chain (2001), the iTunes Store (2003), iPhone (2007) and the iPad (2010), showing the various products in a multi-year pace during his
famous keynotes and making his company one of the richest in the world at the time of his death, the October 5, 2011.

“Good artists copy, great artists steal” – Steve Jobs paraphrasing Pablo Picasso

This sentence means his search for inspiration elsewhere than in the computer field. It thus expresses its ability to link seemingly unrelated things together. In fact, Steve Jobs delivered the following words: “This is to get in touch with what humans have better done, then try to integrate it into what you do. Picasso said: Good artists copy, great artists steal. We have never been ashamed to steal great ideas. If the Macintosh has been so successful is because it is the work of artists and zoologists and musicians and historians who also have proven to be the best computer scientists in the world”. This quote shows that Jobs is less talk of looting as the importance of the notion of association, whose creative process feeds on a variety of experiences.

Steve Jobs is so good at associations (e.g. Apple II inspired by kitchen robots) that Apple continues to innovate today in all aspects of computing including power cords. Called MagSafe, the adapter with which you connect an Apple MacBook on the sector ends with a magnet on the side of the computer. Most users have the bad experience to take on the cord and see helplessly their laptop crashing to the ground. By disconnecting easily the computer and its cord, the MagSafe avoid this terrible scenario. Apple "stole" this idea to the Japanese rice cookers equipped since a long time with this magnet. Specifically, Apple has established a link between two objects apparently foreigners, the rice cooker and the computer.

**7.2. Apple, an innovative organization**

Differentiation is now the watchword of leaders and strategists addressed to the directions of innovation. Differentiation that is precise margin creative, safe, differentiation driven by a continuous flow of innovations, in number, to cost control.
Open Innovation in Business Ecosystem

To give an example, in 2001, Steve Jobs has diversified Apple activities by moving partially toward the music industry with the iPod and the iTunes Store two products designed for digital music, then to the mobile phone with the iPhone. Apple is known for user interface design and very elegant and careful of its products, particularly for the introduction of consumer technologies often considered innovative: the graphical user interface, computer mouse, and multi-touch screen. These elements are, in part, the cause of the prices slightly higher than the market average, and make Apple brand perceived as high-end public opinion. These few words permit to describe this differentiation strategy as vital for the company than for its leader, Steve Jobs.

The Apple Company (as it is also the case for Google or Procter & Gamble) has a lower R&D than key industry players and lives a 2-digit growth over the last 5 years where for others in the same sector is sluggish. These actors are icons of a new kind of a value creation model combining business ecosystem and open innovation.

7.3. **APPLE BUSINESS ECOSYSTEM**

7.3.1. The ecosystem advent

The return of Steve Jobs in 1997 marks the beginning of the Apple ecosystem. Indeed, after many failures, the company bought NeXT, a company founded by Steve Jobs himself to benefit from technologies established by NeXT (e.g. the NeXTSTEP Operating System (OS) that served to create the operating system called "Mac OS X"), and secondly to propel Steve Jobs at the head of Apple.

In his first keynote after his return as the Apple CEO (MacWorld Boston, 1997), Jobs stated: "Apple is living in an ecosystem, and to survive it must get help from its partners". Jobs decided to create a partnership with Microsoft so that the two companies work together on several patent cross licenses, and on the parallel development of Microsoft Office for Mac, and collaboration for the development of "Java" on Mac.

As I said above, Jobs decided to partnering with his rival, Microsoft, on the personal computer market in 1997 in order to beginning the Apple rebirth. This example is a typical case that can illustrate a coopetition strategy between two companies. By
contracting this partnership, Apple cooperated with its nearest competitor to pool knowledge, technologies and competencies and by cooperating with a competitor Apple and Microsoft defined a coopetition strategy on their ecosystem.

7.3.2. An Electronic Business Ecosystem: The iTunes Store

The iTunes Store (formerly iTunes Music Store or iTMS) is the online music store from Apple, available from iTunes, which provides music, TV shows, movies, video clips, audio books, podcasts, games and applications for iPod and iPhone.

iTunes handles transfers of music, photos and videos on various multimedia devices from Apple iPod, iPhone, iPad and Apple TV. It is also streaming software, which lets you listen to radio stations worldwide streamed over the Internet. It integrates the digital hub strategy defined by Steve Jobs in 2001 (Macworld, January, the 9th 2001).

7.3.3. Main actors interacting in the iTunes Store

The iTunes Store gather many actors from different industries. In this part I will list them by industry:

- **Music industry:** the iTunes Store sells music thanks to contracts with four major labels, and also independent labels and distributors of self-producing artists. Moreover, the Apple digital ecosystem now also distributes music videos, audio books, and includes a podcasts directory.

- **Film industry:** The U.S. iTunes Store offers for sale since 2006 television series sold in the episode or season, the motion picture production houses Disney, Paramount Pictures and Lions Gate Films, and short Pixar films.

- **Video Game industry:** Since 2006, the iTunes Store sells downloadable video games designed for fifth generation iPods, mostly developed by Electronic Arts.

- **Book & Newspaper industry:** Sold electronically, this industry is recent and grows on the iTunes Store thanks to the development of the iPad tablet.
Open Innovation in Business Ecosystem

Since July 11, 2008, the iTunes Store added a section called App Store, which allows users to download applications on iPhone, iPod touch and iPad. Apple ecosystem partners mainly develop those applications, this innovation permit to grow up a new industry: the mobile application industry. Indeed, thousands of external software developers write complementary applications for the iPhone/iPad. I will deeply discuss on the App Store and external developers in the subchapter below about the Apple electronic platform.

Main industry enunciated I want to integrate the iTunes Store users because it is possible for them to publish their own iTunes playlist on the iTunes Store. Users can also upload podcasts, as, for Universities, academic courses in various formats (audio, video, books, etc.) thanks to iTunes U, an app dedicated to the sharing of academic knowledge.

In order to have a better view on industries interacting with the Apple iTunes ecosystem, I propose the following figure grouping them around the iTunes Store. The industries are evolving around the Apple iTunes & App Store. I drew the iTunes Store users bigger because they are more numerous.

**Figure 7.1. Different industries interacting on the Apple business ecosystem**
7.3.4. The App Store

The Apple “App Store”, which stands for Application Store, is the service that allows Apple iPad, iTouch and iPhone owners to download applications directly on their device. An application is nothing but a computer program that runs when its launched, it can be video games, web application, message application, social network app, eBooks etc. Applications can be free or not from $0.99 up to $999.

The App Store was launched by July 11, 2008 and operates on the principle of a market place: developers offer their applications to the user community who choose to download them according to its needs and tastes.

Before downloading these applications, users must first open an iTunes account (which include a request of user bank details), and it is with this account that a user can directly connects on the App Store to download applications. Access to the downloading of applications and payment can be done either via the iTunes software, either directly via the device (iPhone, iTouch or iPad).

7.3.5. The developers: A wide community

Anyone can develop and deliver an application dedicated to the App Store. Application developers can therefore be individual or professional developers, companies, brands … first condition to be met, a developer must pay an annual license to Apple for the right to propose its applications; it remains modest at $99 per year for individuals and industries. This license entitles the publisher to make available its application on the App Store. For companies wishing to develop “internal” applications and there is a second license costs $299/year. (Apple Developer Program).

Once license bought, and after having addressed application, a developer will decide its price. The application price is set by the developer (or publisher, or the company, in short the one creating the app), finally, the price is not "100% free" since it must be chosen from levels determined by Apple. Indeed, for readability in the applications pricing, Apple expresses amounts of which the developer will choose, if it is not free the minimum price an application is 0.79 € and then there is different levels (0.79 €, 1.59 €, 2.39 €, € 2.99, € 3.99, € 4.99, € 5.49, € 5.99 etc).
Finally after the price choice, the developer finally submits its application to Apple that will (or not will) validate its application and make it available for download on the App Store.

As it has been demonstrated, the App store is very closed and tightly controlled by Apple. This constant monitoring is the source of much discontent among the community of developers and publishers, which are subject to the whim of Apple who refuses, sometimes arbitrarily, to validate certain applications. Their policy is to prohibit broader applications proposing sexual content, but also applications with too few features, in order to maintain a high quality level.

**7.3.6. Mobile Application Development: The coevolution concept**

March 6, 2008, Steve Jobs introduced in a Keynote in San Francisco a Software Development Kit (SDK) for iPhone to both businesses and consumers. This kit is freely downloadable on the Apple's website and allows developers to create applications for iPhone, iPad and iPod Touch.

Since June 2008, developers distribute their applications through the App Store. Developers have the choice of the price since Apple takes a 30% commission. The success of the kit is immediate, the developer community has done 100,000 downloads the first weekend.

In July 2009, one year after the App Store opening, the number of available applications exceeds 85,000. Every day, hundreds of new applications are available. November 4, 2009, Philip Schiller, senior vice president of Apple, announced that the App Store has reached the symbolic figure of 100,000 applications (Apple Press Info, 2009).

On 6 January 2010, Apple announced that it surpassed 3 billion downloads of iPhone applications. In early March 2010, more than 150,000 applications, developed by more than 28,000 developers (Bemobee.com, October 9th, 2011), are available for download on the app store.

On 7 June 2010, Apple announced that 225,000 applications are available on the app store. Each week, 15,000 applications were submitted and 95% are accepted (WWDC
2010 June 7th, 2010). Since launching the app store one billion dollars was donated to developers (WWDC 2010 June 7th, 2010).

In March 2012, Apple made a contest, the person who downloads the 25 billionth application win an iTunes card for $10,000. This winner will have the choice to download among 550 000 apps. The game is over; the 25 billionth app was downloaded on 03/03/12 (Official Apple Website).

With all these figures, I want to represent the extraordinary development the App Store rising. Indeed, as I said earlier, more than 25 billion applications were downloaded on the App Store since 2007, a very impressive growth. But why the Apple App Store became a real success? Why this developer’s community continues working with Apple despite the strong Apple presence and control on their products? How Apple can survive thanks to this innovative business model? These questions will find answers into the part below.

7.3.7. The remuneration models

7.3.7.1. Apple remuneration model

The goal of Apple is not free to live its developer community; the gentlemen of the firm at the apple are remunerated principally by two means:

A fixed remuneration: annual developers’ licenses.

A commission: a percentage taken from each application sale.

Like any marketplace, charging each developer with a percentage of every sale, that percentage is 30%, compensates Apple. For example if a publisher has sold 100 applications to $0.99, it has accounted for $99 of turnover, he will receive $69,3 (70%) and Apple will take $29,7 as a commission (30%). This deal is not inherently bad in the sense that Apple offers a distribution channel and a fantastic showcase for developers and publishers can concentrate on the manufacture and promotion of their app.
Open Innovation in Business Ecosystem

7.3.7.2. Developers remuneration model

The developers’ objectives with their apps can be many: promotional tool, generate income, increase brand image, for special events, etc. The monetization of an application is not necessarily a goal that is why Apple established a free application distribution mode. However, if a developer wants to earn money directly via an application, revenue models are of four types:

- Income on downloading: If your application is not free, it will earn you money (70% of your business volume) at each download.

- Advertising revenues: most of what is traditionally done on the net, it is possible to advertise in its application and take income depending on the display number, clicks, affiliate, etc.

- The in app purchase: users have to pay extra to acquire content. Example, the “Tap Tap Revenge” music application, freely downloadable and to get new songs users must pay individual songs.

- Subscription: the application content is available as a subscription (e.g. the American Washington Post newspaper application, which costs $ 1.99 per year).

Also, to close this part, I want to insist on the fact that Apple "finances" the developers. The firm has donated four billion dollars, including $700 million the last quarter of 2011 in order to help them evolve and innovate.

7.3.8. Conclusion

Before entering in the explanations of the iPhone platform, I want to regroup information collected for this part and make a conclusion on the Apple App Store ecosystem in order to link the coevolution model implemented by the firm with a theoretical aspect.

As we have seen during this subchapter, the Apple business ecosystem is in interaction with many different external industries capable of creating and providing mobile applications for the App Store since Apple freely offers a Software Development Kit.
However, by exercising a total control of what can (or cannot) be on its marketplace, Apple shows a certain closure on its ecosystem.

Coevolution seen in the Apple organizational strategy between the firm and application developers, is on the fact that Apple rent (with a license) a store for developers that permit communicate and receive remuneration (against a commission taken by Apple). Moreover the Cupertino Company finances developers in order to encourage them continuing creating and innovating on the application development. As Moore (1993) said, a coevolution process strengthens innovation efforts of firms in the same business ecosystem. Furthermore, to illustrate this coevolution process and by quoting Iansity & Levien (2004) Apple and developers have a “Shared Fate” to be successful, they must cooperate to attract more customers and so make their businesses and business ecosystem growing.

The App Store success depends on the wide variety of application sold, the more there will be apps encountering users’ needs, the more there will have downloads. Moreover, by finely selecting applications developed for the App Store, Apple proposes on the store only functional and good quality products.

I made a figure in order to represent fluxes between App developers, Apple though the App Store and iPhone user:

**Figure 7.2. Fluxes between Apple and stakeholders on the numerical business ecosystem**

![Diagram of fluxes between Apple and stakeholders on the numerical business ecosystem]

**LICENSED APP DEVELOPERS**

- Develop Apps and fix prices
- Gives 70% remuneration

**APPLE: APP STORE**

- Sells Apps at the price fixed
- Buy Apps

**iPHONE USERS**

- Takes a 30% commission on sale
As I put forward on the figure above, users need an Apple device to access applications. I took the iPhone because it is the most famous Apple platform on this ecosystem. This iPhone is the platform linking Apple, developers and users. Let’s focus on it in the part below.

7.4. **APPLE ITC PLATFORM: LEADERSHIP WITHIN THE BUSINESS ECOSYSTEM**

When I quote the Apple ITC platform, I quote one of the best Apple successes that have revolutionized the mobile web surfing: The iPhone/iPad. Let’s focus on the iPhone ITC platform case.

7.4.1. **Overview of the platform:**

IPhone is a line of smartphones designed and marketed by Apple Inc since 2007. Products, whose user interface was designed around the multi-touch have a camera, an integrated iPod, an Internet client (for browsing the Web or check e-mail), and basic functions such as text messages and multimedia messages, but also have the App Store, which permit to download applications, from games to social networks, via the GPS, television, electronic media, etc.

7.4.2. **A platform facilitating interactions**

The Apple smartphone, as I said above, provides the App Store and permit to facilitate interactions between Apple, developers and users. To explain in more details, I will give you some precise examples.

First of all, I will repeat my comments saying that Apple evolutes in a vertical integration: The company controls everything in the ecosystem, from the development of its marketplace, to the manufacture of its platform and by choosing what external applications are validated (or not) on the App Store marketplace. Here I want to focus deeply on the fact that, unlike the Google competitor and its Android marketplace using
many platforms (HTC, Samsung, Motorola, etc), there is only one ITC platform existing on the App Store, at least one brand: Apple. Apple products are designed in the same way: To guarantee a great user experience. If Apple decided to close its ecosystem to competition, it is naturally on one hand to be the Leader of its ecosystem, but on the other hand to offer only one kind of product, the best. By this, users have the same device and the same functionality. This specification created a very marked community effect that promotes interactions, exchanges, popularity and success of the Apple brand ITC platform.

Secondly, thanks to its “openness” by permitting external partners to develop new applications, the Apple ITC platform can see its essential function (so, a Smartphone) expanded by the download of new applications on the App Store, made by external Apple partners. This part leads us to see further on its ecosystem: The App Store.

7.4.3. The Apple iPhone and the App Store: Sale of an ecosystem instead of a product

An iPhone without the App Store is just an animated pad. Without the App Store, no applications, no updates, only the basis of a common smartphone.

Interdependence is here mainly bilateral: the iPhone is "dependent" of software. It is the same for the iPod and the iPad. This evokes a strong interdependency link between Apple devices. However, as I explained above, the App Store is dependant of iPhone or any Apple devices. Concretely, the App Store without iPhone will be a ghost marketplace.

An important point to focus on is that what makes today the strength of the iPhone, this is not so much the product (other smartphones have similar technical capabilities, eye-catching design and a lower price), but the ecosystem created around it: Clearly, the applications available through the App Store.

Once the product in hand, 90% of the consumer purchases does not come from the supplier of the product, but from what has developed its ecosystem (i.e. Mobile Apps).

Using the example of the App Store ecosystem, we realize that what makes the product value that is not so much the device (e.g. the iPhone) but what it permits through its
Open Innovation in Business Ecosystem

ecosystem. We can conclude here that the ecosystem is the element that brings value to the product.

7.4.4. Conclusion

This part, dedicated on the Apple ITC platform, allowed us to understand its power through the App Store business ecosystem. To link the theoretical aspects with this empirical study, some points are visible.

Firstly, in order to build an ITC platform, the Gawer & Cusumano (2008) two specific conditions are true:

The platform must perform at least one essential function, here the Apple ITC platform perform a smartphone role.

The platform must allow members to connect easily (by the App Store), and offers the possibility to expand the essential function by new features created by its members (in the Apple iPhone case, it is mobile application developed by partners and downloaded by users).

Secondly, Gawer & Cusumano (2002) explained that being leader of an electronic platform exert considerable influence on the innovation trajectory and on the formed network of customers producing and using “complements”. Apple has a considerable influence on its ecosystem and its platform. Indeed, by selecting developed apps, Apple offers only high-quality features on its ecosystem. This fact permit the App Store to have a lot of downloads everyday. This point constitutes an important income source for Apple (as I demonstrate earlier, Apple sales its ecosystem). To conclude this part, and by paraphrasing Iansiti & Levien (2004), we can assert that mobile apps developers on the Apple App Store ecosystem are “Keystones” because they have a remarkable power through the Apple ITC platform and also the business ecosystem: Without external Apps, Apple, the Leader of its ecosystem would never been so successful.
7.5. Open innovation in a closed business ecosystem: A paradox

7.5.1. Open innovation practices though the App Store ecosystem

On this part we will focus on open innovation cases existing through the App Store business ecosystem. As I presented in my empirical study, the App Store radically changed consumption mode with the online distribution of software made by partners. Before the App Store, software developers had to evolve in a fierce competition in order to have the opportunity to distribute their products. The Apple ITC platform and ecosystem broke down this barrier, by allowing any software developer to distribute and promote its products on the App Store, and by make those apps visible and available to any Apple device users. This last section will enunciate and explain open innovation models commonly used by Apple Inc.

7.5.1.1. Steve Jobs Inside-Out spirit: the Crowdsourcing case

Thanks to its ecosystem, Apple makes available to the public a true technological environment that encourages creativity and gives its users a "digital experience" to which they adhere and encourages others to do the same. Indeed, Apple has brought together a community of increasingly broad willing to be part of the Apple adventure.

Apple had the idea to create a revolutionary new business model based on crowdsourcing, allowing anyone (professional developer and/or user) to create its own application in a procedure and strict criteria, in a controlled, secure environment and providing better visibility through the App Store.

Indeed, the App Store is a kind of crowdsourcing concept (e.g. the SDK tools permits for developers and users to benefit from Apple competencies in application development) coupled with a network effect (Rohlfs, 1974), since users bring a real added value to this ecosystem.
7.5.1.2. The Steve Jobs Outside-In spirit

Let’s begin this part with one of the most famous open innovation example: The Apple/Xerox PARC case. Xerox created in 1970 a research center in Palo Alto computer, named PARC. These included Xerox to capitalize on the acquisition of computer company Scientific Data Systems. A number of innovations have emerged: the Graphical User Interface (GUI) that is still used today, icons controlled from a mouse, the screens in several colors, the Ethernet protocol, fonts, etc. In 1979, Steve Jobs, Apple founder, visited this research center.

While the PARC head management became aware of its inability to exploit the GUI that was developed by its researchers, Steve Jobs saw the potential of this innovation that the company has not carried out internally. A partnership was established between Xerox and Apple to allow Apple to use this GUI on its famous Macintosh.

This is concrete case showing open innovation, simply because a firm exploits R&D results of another company. Moreover it is an outside-in innovation process because Steve Jobs “took” this idea from the PARC in order to create an innovative product: The Macintosh.

Steve Jobs was not a leader using inside-out processes. As I explained above, there is a real secrecy at Apple, and more precisely about internal R&D. But concerning the inside-out process, Steve Jobs was a great thinker, and a visionary, he had (most of the time) the particularity to find ideas at embryonic level and turn them into commercial successes. To illustrate my words, I will present the iPod conception case below.

I choose this case because firstly, the Apple iPod is a tool present on its ITC platform and secondly because a recent court case against Apple revealed the origin of this product. To be clear: iPod is not the original fruit of Steve Jobs or Apple team.

The original concept was actually born in the head of a British inventor, Kane Kramer. The latter filed, in 1981 in the Patent Office, the iPod concept (named IXI at it origin) and decided to launch the company itself, which was to produce the music player of the future. But in 1988, when he was ready to take action, its administration board refused to renew this expensive patent (about 60,000 Euros for 120 countries). So the idea of Kramer fell into the public domain and Apple acquired it.
So here come from the original concept. It remained to industrialize the concept. This is on this part that Apple has managed to implement the outside-in approach. The iPod project is born by the encounter of Steve Jobs with Tony Fadell, ex-employee of GE and Phillips, who wanted to invent a better MP3 player. After disappointments with Phillips and Realnetworks, Fadell received support from Apple and succeeded in eight weeks to develop an iPod prototype. He was hired in 2001 as Chief of independent project to lead a multi disciplinary team of 35 people. Again, the opening to the outside for research skills was appropriate. The partners in this team were integrated companies like IDEO (design), General Electric, Connectix and WebTV. At the software level, companies such as PortalPlayer and Pixo were responsible for developing the GUI under the direction of Steve Jobs. Thus, with this team, Apple could launch the iPod on the market in only six months.

Using this example, it is interesting to note that one of the Apple key success factor is therefore its ability to get outside from the company ideas, technologies and skills Apple need and integrate them into its innovation strategy. This allows to company to go even beyond its strong internal innovation capabilities.

### 7.5.2. A new effective business model

Apple does not innovate only technologically but has set up a real business innovative model.

At the iTunes launching, the press was very critical. However, the music industry has had to use it, the Apple digital marketplace is even now perhaps the only bulwark against illegal music downloading. Apple does not sell music but offers a secure and pleasant to use online service of music providing.

How to sell something that has become free? Doing it better than free. Same principle to the App Store, how to fight against the gratuitousness of Open Source? Revenues from distribution of third party software are becoming more important as selling the devices.

Apple has focused its business model on the establishment of a true multi-face platform. Such a platform connects actors from the content, telecoms and information technology industries: music and movie producers, software developers, game publishers, and
Open Innovation in Business Ecosystem

telecom operators. Apple thus becomes an intermediary for access to a market driven and controlled by its technological ecosystem.

7.5.3. The paradox: A closed & perfectly controlled ecosystem

In this part I want to insist on something really interesting, and proper to the Apple strategy: Everything is extremely controlled by Apple. Indeed, Apple introduced a complete system with software & hardware platform, and an online distribution tool that belongs to it.

7.5.3.1. On the developer side

According to Mohssen Toumi from Booz & Company, the firm is very strict and methodical in the developers and apps selection. Developers’ apps are key products because the user have varied and specific needs. Indeed, one actor cannot provide everything.

However, in order to keep its Store “clean”, Apple does not hesitate to make law on its numerical ecosystem. Indeed, the firm controls everything that passes through it.

Let’s focus on the Molinker developer case and its 1011 Apps. A user noticed that several of these programs had a common point: a commentary poorly written but giving five stars, which is the maximum rating on Apple’s online store.

Suspecting something, this user sent a letter to the iPhonography blog, which covers topics related to photography and video. The letter was then transferred directly to Phil Schiller, the vice president of marketing at Apple, one of the main leaders of the firm.

Finally, the developer Molinker had adopted the following technique: he distributed free copies of its applications and in exchange users gave to its programs the maximum scores, even bad writing criticism. When the maneuver was discovered, Apple immediately took actions: the 1011 applications were all removed from the App Store, and the developer has been banned.
The message to the Apple developer community is clear: if they want their applications known, they must do it by means permitted. This example shows that Apple is the only judge on the App Store, and does the police in order to keep security and order in its numerical store.

Let’s take the example of the Non Disclosure Agreement (or NDA is a close that each developer has to sign before they can access the SDK, which is in a private access. This NDA prohibits to report anything or talk about the new “Enyo” language: the basis of the Apple applications) on the SDK, checks required before validation for the application to be broadcasted on the unique installation area (the App Store) give to Apple right to life and death on any iPhone application project.

This is one of the reason showing that the App Store cannot accommodate open source project, because diffuse software sources violates the SDK NDA. And a developer may find itself pushed back after several days/months on the development of an application and paid the $99 right of access to the App Store. Apple does so in order to maintain a stable, clean and consistent ecosystem.

Moreover, in order to avoid all competition (ever on Apple-made Apps), the Cupertino firm do not hesitate to erase external Apps that makes similar tasks as Apple Apps. To give a precise example, let’s take the Evi Case.

Evi is an application available on the App Store. Developed by True Knowledge, it could have a narrow relationship with Siri, the vocal assistant present on the iPhone 4S. Indeed, it performs similar tasks, and can even be more extensive for some. However, Apple through representative Richard Chipman reported that Evi would be removed from the App Store because it is too similar to Siri. According to Chipman, they break a rule in the charter developers, "Applications that are confusing to a product or an advertisement similar to an existing from Apple will be rejected". Apple employs App administrator to control and test any new developed and proposed App for the App Store, this permit to offer the best quality Apps by avoiding any incompatible applications.
Open Innovation in Business Ecosystem

To conclude on this part, Steve Jobs' company has built its ecosystem on a total control over the value chain, from beginning to end: it imagines the terminals (e.g. the iPhone), the control platform distribution (e.g. the App Store) and operates on the cloud computing. Apple prefers a closed and proprietary ecosystem with a unique access to content for users based on the apps download on the App Store. We will deeply focus on this part in the subchapter below.

7.5.3.2. On the user side

All Apple products can work together, however, when you buy Apple product and so its ecosystem, it is impossible to get access to competitor services. As I mentioned earlier, an iPhone device works with iTunes and the App Store, and only with those tools. To give a precise example, the App Store (compared with its competitors) only works with Apple products, users can connect on the App Store with compatible iOS devices, devices created by Apple.

Moreover, when users buy music/Apps on the App Store, these products are saved on their personal iTunes account and are impossible to transfer on competitors ITC platforms (e.g. RIM Blackberry or Google Android).

By controlling and closing barriers on its ecosystem, Apple can easily keep its users, avoiding them to test competition products. So, it is difficult for users to separate from the Apple ecosystem.

To complete this part, the Apple strategy is to “trap” users in its ecosystem. Indeed, by providing exclusive Apple products, from the ITC platform to the numerical ecosystem working with this platform, and since the apparition of the cloud computing and with the Apple iCloud, for all users buying products on this ecosystem, and storing their data on this “cloud”, it becomes more and more difficult to move from one ecosystem to another. “This is the lock-in effect”, highlight Louis Naugès, or the user detention from the interior.
7.5.4. A business ecosystem targeting to open itself

Since the creation of the iOS 5 (OS especially present in the Apple iPhone 4s, last born of the firm), Apple targets to deeply integrate the Twitter services. Thus, application developers for mobile devices directly from Apple can add features to their social sharing solutions. This integration allows the Cupertino Company to open its products to the web 2.0 and catch up its delay, given the limited success of previous attempts on a social network creation (Ping on iTunes). Moreover, this is the first time the company includes automatically an external service inside its platform (all base services present in the iPhone were Apple developed applications).

But why choosing Twitter, rather than Facebook, given the popularity of the latter? This is because a simple difference separating both social networks. Thus, Facebook is truly a social network, and a closed network, just like the Apple ecosystem is closed. It functions as a shared database. Instead, Twitter is a free open diffusion with a lower sociability (followers and friends). Functioning as a messaging bus (W. Vambenepe), it connects the "closed garden" Apple outward, instead of redirecting it to another "closed garden", differences that may have counted for Apple in the choice of the firm.

7.6. Empirical Study Conclusion

More recently, several studies have attempted to take stock of the open innovation phenomenon and appreciate the future lines of development (Gassman et al, 2010; Giannopoulou et al, 2010). ICT platforms are an important element cited in my research and investigations in this area should provide a better understanding of the open innovation practices. Beyond that, the "platformization" (Evans et al, 2006) of the innovation process is not neutral as outlined Evans & Schmalensee (2007). The race to open innovation is increasing through platforms and it is through these platforms that companies will compete to ensure their adherence to their business ecosystem and maintain leadership. Work on the platforms indicates that network effects can lead to the supremacy of one platform to another (Evans et al, 2006 speak of "platform
Open Innovation in Business Ecosystem

Imperialism”). In this context, a platform could easily drain and take on board influential players with the risk of falling into a form of “Not Invented Here” syndrome. Members of this "club" would innovate together what would not be without problems for ecosystems competitors.

The business ecosystem study opens up avenues of investigation that seem very fertile because they make the connection with many works and theories as platform strategies and open innovation. But the main difficulty at this level is the wide variety of observable configurations: there are indeed different platforms strategies and several possible variations into collective innovation logics (outside-in, inside out, the combination of both).

Nevertheless, in order to link my theoretical researches to my empirical study, I made this figure, adapted from the synthetic scheme implemented in my conceptual framework (i.e. figure 6.6). This figure 7.3 shows the different links provided through the empirical study of the Apple Company. Here it is possible to understand how open innovation, ITC platform and organizational strategy of Apple are linked to its business ecosystem.

As I mentioned above, Apple made the conscious choice to create value and innovate with external App developers thanks to the SDK. This open innovation process is linked to the Apple ITC platform. Indeed, without this platform, users cannot access to Apps developed by Apple partners through the App Store, and there are no possibilities for Apple and its third parties to create value. So the ITC platform is the central technology permitting the Cupertino Company to link its organizational innovative strategy to open innovation processes through its ecosystem.
Figure 7.3. ITC platform at the heart of the Apple open innovative organizational strategy
CHAPTER 8. CONCLUSION & RECOMMENDATIONS

8.1. GENERAL SUMMARY OF THE STUDY

The main objective of this research was to address the open innovation management within the business ecosystem, and that, by adopting a different angle of approach from the one adopted by traditional methods. Throughout this study, I have actually adopted an approach to combine various searches, including those of Moore, Iansiti & Levien Peltoniemi in the business ecosystem concepts, and those of Chesbrough, Rabeau and Leadbeater in the open innovation framework, which have been indispensable to provide various answers to my research question: “To what extent does the business ecosystem can be effective in a leadership strategy of innovation open for innovative firms?”

To do this, I proposed a conceptual framework respecting these interests of integration and the character both complex and systemic associated with the organization and its business ecosystem. Using a case study, I have been able to verify the relevance of such a framework (in this case the company Apple Inc.). Such a choice is explained by the fact that the company gave an iconic vision of the business ecosystem concept, and this, through the competitive dynamics characterizing its technological environment.

It is important however to precise that the choice of a case study methodology is explained by the flexibility of this kind of approach. A quantitative study would have limited my analytical framework, and I would not have been able to adequately respond to the various research questions. These are too static methods for such analysis. It seemed even more evident in my description of the Apple business ecosystem, which featured not only a real diversity in the players (music industry, movie industry, video game industry, mobile application developers, users, etc.), but mostly illustrate
competitive dynamics, which intensity contributed greatly to shaping the open innovation practices maintained by the Cupertino Giant.

I studied the evolution of the business ecosystem of Apple here based on three sub-chapters, which I summarize as follows:

• Sub-Chapter 1: The Business of Apple ecosystem (7.3)

As we have seen during the first part, the Apple business ecosystem is in interaction with many different external industries capable of creating and providing mobile applications for the App Store since Apple freely offers a Software Development Kit. However, by exercising a total control of what can (or cannot) be on its marketplace, Apple shows a certain closure on its ecosystem.

Coevolution seen in the Apple organizational strategy between the firm and application developers, is on the fact that Apple rent (with a license) a store for developers that permit communicate and receive remuneration (against a commission taken by Apple). Moreover the Cupertino Company finances developers in order to encourage them continuing creating and innovating on the application development. As Moore (1993) said, a coevolution process strengthens innovation efforts of firms in the same business ecosystem. Furthermore, to illustrate this coevolution process and by quoting Iansiti & Levien (2004) Apple and developers have a “Shared Fate” to be successful, they must cooperate to attract more customers and so make their businesses and business ecosystem growing.

The App Store success depends on the wide variety of application sold, the more there will be apps encountering users’ needs, the more there will have downloads. Moreover, by finely selecting applications developed for the App Store, Apple proposes on the store only functional and good quality products.

• Sub-Chapter 2: The Apple platform: A tool for co-evolution (7.4)

Regarding the second part of my case study on the Apple platform, I provided an overview of interdependencies established by Apple with its partners within the business ecosystem, which helped to consolidate its innovation efforts (Moore, 2003), or
Open Innovation in Business Ecosystem

choose the co-evolution with its ecosystem partners. In addition to its internal R&D operations, Apple increased the share of spending outsourced in this area by leveraging the contributions of several members of the value chain. The presence of the iPhone platform has also helped to increase the value generated within the business ecosystem, and by encouraging the contribution of various actors. This seems to corroborate the idea that electronic platforms are an essential structure for the sharing of value by all members within the business ecosystem (Iansiti and Levien, 2004, p.114).

Secondly, Gawer & Cusumano (2002, pp.28-35) explained that being leader of an electronic platform exert considerable influence on the innovation trajectory and on the formed network of customers producing and using “complements”. Apple has a considerable influence on its ecosystem and its platform. Indeed, by selecting developed apps, Apple offers only high-quality features on its numerical ecosystem. This fact permit the App Store to have a lot of downloads everyday. This point constitutes an important income source for Apple. By paraphrasing Iansiti & Levien (2004, p.114), I can assert that mobile apps developers on the Apple App Store ecosystem are “Keystones” because they have a remarkable power through the Apple ITC platform and also the business ecosystem: Without external Apps, Apple, the Leader of its ecosystem would never been so successful.

• Sub-Chapter 3: Open innovation in a closed ecosystem: The Paradox (7.5)

Examination of the third party has revealed that open innovation requires an infrastructure - dedicated or not - able to handle the different partners contributions (material or immaterial) inside, but also outside the borders of the company. The ICT platform is essentially an intermediary device that connects, to bring together, to exchange and share. As such, its role is fundamental in the development of open innovation. The fact that the open innovation phenomenon has emerged in a period characterized by a strong interest in collaborations of all kinds and the Internet (Huizingh, 2010; pp.2-9) is not neutral. Development of technologies from the Internet and especially ICT platforms greatly facilitated the development of practices and the opening of the innovation process of companies. There are therefore a lot of reasons to believe that with the development of ICT, other practices and new forms of open innovation will emerge.
8.2. RESEARCH CONTRIBUTIONS

The most important contribution of this research is the design of an analytical framework that enabled to decipher, at least in part, the complexity associated with managing the open innovation operation of a firm within a broad, diffuse and complex environment that is the business ecosystem.

Such a result has its origin from personal reflections developed using numerous books, articles, essays, and of course personal perspectives. It was thus easier, from this synthesis of ideas, putting together a free spirit and my own judgment.

In addition, my study is part of a perspective targeting to watch as clearly as possible innovation operations, by observing them at Apple, a company operating in the ICT sector. However, this study could be a relevant basis for further research by observing a larger number of cases, and comparing Apple with some of its main competitors.

Finally, I consider that my synthesis diagram could be presented as an original observation model, which would be able to guide business leaders toward a better understanding of the inherent key dimensions in business ecosystems of their businesses.

8.3. RESEARCH LIMITATIONS

The methodological approach I have advocated obviously has some weaknesses. Mention first, as the first limit, the transparency and credibility degree of the information contained in the documents and articles that I have examined. As the study was mainly based on qualitative data, generalizable only in specific contexts, it appears that my study could be flawed by some inherent subjectivity. To address these criticisms and to make sure of the validity of this study, however, I applied as carefully as possible the precepts set out below.
Open Innovation in Business Ecosystem

First, information has been sparingly selected, so that the data have a link with the conceptual framework and with my research question. The analysis has therefore not diverted to issues of secondary research questions due to any excess information from a wealth of secondary data, which allowed me to avoid suffocation due to a high number of data.

Second, data analysis was performed with a concern for triangulation of information. To do this, data were collected from multiple sources (official documents of the company, press releases, case studies, video conferencing, etc.) known for their seriousness and credibility (Official Website Apple, Apple Press Info, Steve Jobs Keynotes, etc.)

The second limitation of my study concerns the method of content analysis. This method limited me because the Apple Company has a very important cult of secrecy. This information gap has somewhat affected the quality of my analysis, while forcing me to work twice as hard to provide for a clear analysis and particularly rigorous. Some information was also difficult to access, which would have been useful for this study.

While enriching, my attempt to create a conceptual framework integrating several dimensions have number of dangers, the greatest risk is a lack of depth in the concepts discussed. Moreover, realizing at the same time a Master Degree in Management at the ESC Bretagne Brest, as well being an apprentice in a French company, time management for this study, my Master exams and my apprentice work have been complex.

**8.4. Future research opportunities**

I must finally admit that the limitations of this study are all interesting avenues of research. Indeed, it could be interesting (for example) to use in conjunction with the case study, a quantitative methodology that would confirm some ideas. Moreover, the complexity associated with my research always opens the door to many questions raising various reflections of all industry players from the Smartphone industry. Here are also a few: Is there a threshold beyond which technology companies can no longer opt for an open innovation approach within their ecosystems? Should we seek other
analysis means to elucidate as best as possible the future developments that may affect the smartphone industry?

In conclusion, although some limitations remain, we must admit that this research project was conducted on the basis of deep reflection to bring some actuality and originality (a few researches has examined the integration of the two concepts). Many precautions were also taken to make this study the most rigorous ever (triangulation of data, verification of the authenticity of data, etc.). With such a vision, it was possible for me to enrich the research on the management issue of open innovation within the business ecosystem of a firm.
REFERENCES

BOOKS & ACADEMIC DOCUMENTS


marché des ERP’, 13 e conférence de l’AIMS, Vallée de Seine 2,3 et 4 juin 2004, Normandie.


Open Innovation in Business Ecosystem


Open Innovation in Business Ecosystem


Open Innovation in Business Ecosystem


Wright, R .2008. ‘How to get the most from university relationships?”, MIT Sloan Management, vol. 49, no 3, pp.75-80.


WEBSITE & ONLINE ARTICLES

Al-Rubae, A. ‘Apple Innovation; a Case Study.’ Unknown Date. Online Article.  
<https://docs.google.com/viewer?a=v&q=cache:g2IdW8_YlBUJ:events.kustar.ac.ae/EBTIC/Techical%2520Notes/slides/Session%25202%2520Apple.pdf+&hl=fr&gl=fr&pid=bl &srcid=ADGEESjNcP4X0A8ROEBtOuDnx4zJ4Pnp3DtlUghQoCWaVEgv5mVK8DZNS6Iq70PbXUY25Lpw40gVUajf-h8wxBm8C9hc0DmKpEbPVReRGUyUBuiZMGAc-h85y9pamafrQYGtpnVaAs&sig=AHIEtbQ8vC3gQhbajMLdjWRlp4ofbV>


<https://docs.google.com/viewer?a=v&q=cache:sRXns24dBclJ:www.promanchester.co.uk/assets/Applecasestudyle.pdf+&hl=fr&gl=fr&pid=bl&srcid=ADGEEShLSIm-
y110zMQ7VCuTUVelcza64pRSwNTDrIqecs_hLsk02Qn7yNvYGMIU0xBqmbwJwZcfjTm5Zjp4pSyAE18gATNiThpq8X2mQDWhSKwhKcSvi7BrXkh_BidCJtvCWc-BrFk&sig=AHIEtbTFPijf9xtQiXiLQ3psMWhDqGef6Q>


‘iPhone>>Microsoft. Que ce cache-t-il derrière ce titre énigmatique.’, February 2012.  
Online Article. <http://nauges.typepad.com/my_weblog/2012/02/iphone-microsoft-que-se-cache-t-il-derriere-ce-titre-%C3%A8re-ce-titre-%C3%A9nigmatique-un-incroyable-succ%C3%A8s-%C3%A8conomique-au-dernier.html>

Open Innovation in Business Ecosystem

<http://www.fastcompany.com/most-innovative-companies/2012/full-list>

Toumi, M. Mobile App Stores for Telecom Operators The Next Battlefield, Booz&Co, 2010. Online Article. <https://docs.google.com/viewer?a=v&q=cache:HjRm5-LTLMoJ:www.booz.com/media/uploads/Mobile_App_Shares_for_Telecom_Operators.pdf+%&hl=fr&gl=fr&pid=bl&srcid=ADGEESi8j18dpdvYF-6_ra3CzVxiRNhK2HWWj82Bbq1CE7gnZBHAFi64IIsPuRHR5uQ0S-PDO-NTjCviUj7ZctccvlOTmSeacolIJsaojIt38iZ1w2HLqD7V5gLC4IDFRV5BQcvD&sig=AHIEtbSHfEHNP0deWfZU2966SRzW2706g>

<http://pubs.wri.org/pubs_pdf.cfm?PubID=3027>

Online Video documents

<http://www.youtube.com/watch?v=I0s6hnTI4lw&feature=related>

Macworld Conference & Expo. 2007. ‘iPhone Presentation.’ San Francisco’s Moscone West. Online Video.


<http://www.youtube.com/watch?v=xo9cKe_Fch8>

<http://www.youtube.com/watch?v=SHlIK_hKFxY&feature=related>