What are the characteristics of leaders when managing innovation in organization?
A combination of traits and skills

Authors: Guillaume Thiollière
          Tiffany Detouillon

Supervisor: Ulrica Nylén

Date: 2011-06-03
Room: 212
Time: 15 - 17
ACKNOWLEDGMENT

We would like first to thank our supervisor, Ulrica Nylén, for her precious advises and availability, her guidance and support from the beginning to the end of the thesis.

Then, we thank you all the managers we interviewed for their kindness, their availability, and the interesting discussions that allowed us to collect useful information.

Finally we offer our regards to all of those who supported us and help us during the completion of our project.

Thank you!

Guillaume Thiollière & Tiffany Detouillon
ABSTRACT

Nowadays, organizations are evolving in a dynamic and complex context due to the globalization. In order to deal with this complex environment, innovation is said to be a key factor to gain competitive advantages. Leadership is one of the crucial factors to manage innovation. Indeed, in innovative companies, leaders are responsible to manage innovative projects, and try to make them successful. To do that, leaders need to use personal traits in combination with specific skills.

That is why, the aim of our study is to recognize and identify the characteristics of leaders in innovation: a combination between personal traits and skills. Traits and skills are two distinct aspects of leaders’ characteristics. Indeed, traits deal with characteristics that pertain to a person; they are genetically determined, whereas skills are the ability to do something well. Those characteristics would vary according to the level of innovation, and through the innovation process.

This study is conducted as a qualitative research and data were gathered thanks to semi-structured interviews. We have interviewed upper managers and project managers in innovative Swedish companies in Umeå, and compared the data we collected with the theories from the literature review.

It has led us to distinguish certain types of traits and skills that can be combined together according to the innovative context in order to help leaders in their mission. Most of the traits and skills that we have defined in the theories have been identified through the interviews, while other have been discovered thanks to the interviews. Moreover, our study has permitted to clarify the link between traits and skills assuming that traits can be a base to develop skills. Finally, thanks to the interviews, we have also discovered that the complex context of innovation is not the only one that leaders in innovation need to manage. They have also to deal with the size of the companies they are working in. This also impacts on their characteristics.

To conclude, no previous researches have been made about leaders’ characteristics in innovation with analysing both traits and skills. Indeed, no clear distinction has been made before between these two aspects of leader’s characteristics in the innovative context. We hope that our study can permit to contribute to the research in this field, first by making a clear distinction between traits and skills, and also by finding how they can be combined according to the innovative context.
# TABLE OF CONTENTS

1 INTRODUCTION ......................................................................................................................... 1  
1.1 BACKGROUND......................................................................................................................... 1  
1.2 RESEARCH QUESTION ........................................................................................................... 3  
1.3 PURPOSE ............................................................................................................................... 3  
1.4 OUTLINE OF THE STUDY: .................................................................................................... 4  

2 LITERATURE REVIEW .............................................................................................................. 5  
2.1 INNOVATION AND INNOVATION PROCESS ........................................................................ 5  
2.1.1 Innovation types .................................................................................................................. 5  
Low degree of innovation ............................................................................................................ 6  
Medium degree of innovation ..................................................................................................... 7  
High degree of innovation ........................................................................................................... 8  
2.1.2 Innovation process .............................................................................................................. 9  
2.2 LEADERSHIP TRAITS AND SKILLS THEORIES ................................................................ 12  
2.2.1 Leaders’ traits .................................................................................................................... 12  
History of leadership traits approach ......................................................................................... 12  
Basic leaders’ traits ..................................................................................................................... 18  
Current research of leader’s traits in innovation ........................................................................ 19  
2.2.2 Leaders’ skills ................................................................................................................... 22  
Technical skills .......................................................................................................................... 22  
Non-Technical skills .................................................................................................................... 24  
2.2.3 Summary of the literature review ..................................................................................... 28  
2.2.4 Interview guideline .......................................................................................................... 29  

3 METHODOLOGY ....................................................................................................................... 30  
3.1 METHODOLOGICAL ASSUMPTIONS ................................................................................ 30  
3.2 OUR QUALITATIVE APPROACH ......................................................................................... 31  
3.3 RESEARCH DESIGN ............................................................................................................. 32  
3.4 DATA COLLECTION METHOD .............................................................................................. 34  
3.5 ETHICAL CONSIDERATIONS AND LIMITATIONS ............................................................ 35  

4 EMPIRICAL OBSERVATION ...................................................................................................... 37  
4.1 INTERVIEW N°1 ..................................................................................................................... 37  
4.1.1 Company and innovation context ..................................................................................... 37  
The company ............................................................................................................................. 37  
Leader’s job ................................................................................................................................. 38  
Leader’s link to innovation process .......................................................................................... 38  
4.1.2 Leader's skills and traits ..................................................................................................... 38  
Experience and educational background .................................................................................... 38  
Managerial skills, communication and relationship skills .......................................................... 39  
Leader’s feelings about his job ..................................................................................................... 39  
Leader's strengths and weaknesses ........................................................................................... 40  
Traits observation of leader 1 ................................................................................................... 40  
4.2 INTERVIEW N°2 ..................................................................................................................... 41  
4.2.1 Company and innovation context ..................................................................................... 41  
The company ............................................................................................................................. 41  
Leader’s job ................................................................................................................................. 41  
Leader’s link to innovation process .......................................................................................... 41  
4.2.2 Leader's skills and traits ..................................................................................................... 42  
Experience and educational background .................................................................................... 42  
Managerial skills, communication and relationship skills .......................................................... 42  
Leader’s feelings about his job ..................................................................................................... 43  
Leader’s strengths and weaknesses ........................................................................................... 43  
Traits observation of leader 2 ................................................................................................... 43  
4.3 INTERVIEW N°3 ..................................................................................................................... 44  

---

Characteristics of leaders in innovation

---

IV
Characteristics of leaders in innovation

4.3.1 Company and innovation context ........................................ 44
The company ........................................................................... 44
Leader's job ............................................................................. 44
Leader's link to innovation process ........................................... 44
4.3.2 Leader's skills and traits .................................................. 45
Experience and educational background .................................. 45
Managerial, communication and relationship skills ................. 45
Leader's feelings about his job ............................................... 45
Leader's strengths and weaknesses ......................................... 46
Traits observation of leader 3 ................................................. 46
4.4 INTERVIEW N°4 ................................................................. 46
4.4.1 Company and innovation context ................................. 46
The company ........................................................................... 46
Leader's job ............................................................................. 47
Leader's link to innovation process ........................................... 47
4.4.2 Leader's skills and traits .................................................. 47
Experience and educational background .................................. 47
Managerial skills, communication and relationship skills .......... 47
Leader's feelings about her job ............................................... 48
Leader's strengths and weaknesses ......................................... 48
Traits observation of leader 4 ................................................. 48
4.5 INTERVIEW N°5 ................................................................. 49
4.5.1 Company and innovation context ................................. 49
The company ........................................................................... 49
Leader's job ............................................................................. 49
Leader's link to innovation process ........................................... 49
4.5.2 Leader's skills and traits .................................................. 50
Experience and educational background .................................. 50
Managerial skills, communication and relationship skills .......... 50
Leader's feelings about her job ............................................... 51
Leader's strengths and weaknesses ......................................... 51
Traits observation of leader 5 ................................................. 51
5 ANALYSIS ............................................................................. 53
5.1 BASIC INTERVIEW INFORMATION .................................. 53
5.2 CONTEXT ANALYSIS ........................................................ 54
5.2.1 Impact of company's structure on the types of innovation and the innovation process 54
5.2.2 Types of innovation ....................................................... 55
5.2.3 Innovation process ......................................................... 57
5.3 TRAITS ANALYSIS ............................................................. 59
5.3.1 Identification of basic traits ........................................... 59
5.3.2 Complement to basic traits ............................................. 61
5.4 SKILLS ANALYSIS ............................................................. 62
5.4.1 Technical skills ............................................................. 62
5.4.2 Non-Technical skills ...................................................... 64
5.5 COMBINATION OF TRAITS AND SKILLS IN THE INNOVATIVE CONTEXT .................. 67
6 CONCLUSION ........................................................................ 70
6.1 FURTHER RESEARCH ....................................................... 71
7 REFERENCES ......................................................................... 72
8 APPENDIX ............................................................................. 75
TABLE OF FIGURE AND TABLES

Figure 1: The structure of our research ................................................................. 4
Figure 2: Innovation process .................................................................................. 10
Table 1: Summary of main leader’s traits ................................................................. 17
Table 2: Summary of leader’s traits in innovation .................................................. 20
Table 3: Skills needed depending on the degree of innovation/ responsibility .......... 27
Table 4: Basic interview information ........................................................................ 53
Table 5: combinations of traits & skills that lead to a successful leadership in innovation ................. 69
1 INTRODUCTION

1.1 Background

Almost all organizations are evolving today in a dynamic environment characterized by rapid technological changes, shortening product life cycles, and globalization (Gumusluoglu and Ilsev, 2009, p. 265). Consequently, organizations need to be more creative and innovative to survive, to compete, to grow and to lead. Thus, innovation is essential for company to gain competitive advantage, and to be successful (Gumusluoglu and Ilsev, 2009, p. 265). Indeed, the imperative to implement successful innovation has gained a greater importance as a consequence of rapid technological changes associated with market instability (O’Regan and Ghobadian, 2006, p. 299). Innovation is presented as a key driver of sustainable competitive advantage (O’Regan and Ghobadian, 2006, p. 299).

Innovation can be generally defined as the successful implementation of creative ideas within an organization (Gumusluoglu and Ilsev, 2009, p. 265). This means that a new idea is developed and implemented into the market, in order to gain market advantages. This involves many changes inside the organization depending on the degree of the innovation, which can be more incremental or more radical. In order to manage the innovation process and gain a competitive advantage, many factors must be taken into consideration.

Leadership has been suggested to be the most important factor affecting innovation (Gumusluoglu and Ilsev, 2009, p. 265). Elenkov and Manev (2005, p. 381-382) argue that “the economic and producing power of a modern corporation lies more in its intellectual capabilities than in its hard assets”. Many variables influence creativity and innovation, but it has been said that leaders and their behavior represent a particularly powerful influence (Mumford et al., 2002, p. 705). Moreover, leaders in innovation cannot rely on predefined structures, but must be capable of inducing structure and providing direction to work where there is no inherent direction (Mumford et al., 2002, p. 711). Indeed, a number of studies have demonstrated the relationship between creativity and leadership (Mumford et al., 2002, p. 706-707). Globally, these studies assumed that leadership is related to innovation, and also that the leaders can motivate people to engage in innovation. Moreover, the decision of innovation linked to the wish to gain competitive advantages depends on leaders decisions. Indeed, innovation decision depends directly on the global corporate strategy and consequently, top management leaders have a direct influence on innovation (Hoffman and Hegarty, 1993, p. 2). The importance of leaders in an innovative context allow us to assume that leaders’ characteristics are one of the most important success factors in innovation.

The characteristics of a leader are everything that composed a leader and influence his or her behavior. In a corporate and innovative context, the characteristics influence the leaders in order to take right decisions and fulfill goals and objectives. In this study, we have defined leaders’ characteristics as leaders’ traits and skills, which appear to us to be essential for the success of innovation.
According to Oxford dictionary 2011, a trait is defined as “a distinguishing quality or characteristic which typically belong to a person; a genetically determined characteristic”. A skill is defined as “the ability to do something well; an expertise”.

The trait-based theory of leadership benefits nowadays from a re-emergence, after having being disclaimed. Indeed, traits approach was one of the first approaches to study leadership. Formerly, “great person” theories of leadership were popular (Pierce and Newstrom, 2008, p. 65). This means that it was assumed that some individuals were born to lead. Then, in the twentieth century, a question was raised to know if leaders would own a common set of traits that furnish them leaders’ capacities. A major finding of this time relies on the research conducted by Stogdill (1948) who suggests that there were no specific leaders’ traits that differentiate leaders from non-leaders across situation. In other words, Stogdill notices the importance of the situation. For example, the person who is a leader in one group may not be a leader in the next situation (Pierce and Newstrom, 2008, p. 66). An individual does not just emerge as leader by possessing key traits. Finally, the trait approach has earned a new interest, with a current emphasis on visionary and charismatic leaders (Northouse, 2010, p. 16). In short, the trait approach is alive and well (Northouse, 2010, p.16). Following this reasoning, it appears that leaders in innovation should own a common set of traits that make them different from other leaders. Thus, some researchers have tried to identify what were these traits that characterize leaders in innovation, even if this non-exhaustive list of characteristics is not easy to establish.

Traits can be defined as “genetic” characteristics that someone owns and determine if he/she has the potential to be a leader or not. In companies, leaders need also to own managerial characteristics in order to make business or project successful. When analyzing the characteristics of leaders, we need to complete trait attributes with skills attributes. Such as traits, lots of skills can exist. Indeed, skills are different for everyone and depend mainly on the experience of the leaders and the context where they evolve. Everyone owns skills and the fact to own some types of skills give more change to become a leader or not. Different researches have been conducted in order to define what could be those skills. Bennis (1989, p. 23) has described several skills that a leader own. Katz (1974, p. 92) also proposed a three skills approach in order to understand the skills of an effective leader. These researches demonstrate that different skills can exist, depending on the situation where leaders evolve.

Even if leaders cannot own all these skills, they can be determinant for a successful management, especially in an innovative context. The skills that help a leader to fulfill his or her goals can be different depending on his or her mission. So the skills that a leader might possess can participate to the success of the company. In an innovative context, leaders need to own skills that allow them to bring an innovative idea to the market. During all the innovation process, the expectations are different, and so the leaders have to use different skills throughout this process (Deschamps, 2005, p. 32). The skills that a leader will need to own and need to use will also be different depending on the typology of the innovation and the strategic focus (Deschamps, 2005, p. 34).

The 20th century has been the most active in term of innovation and has brought researchers to analyze and write about this subject progressively with the change of innovation typology and the improvement of innovation process. The indirect links
between leadership and innovation have been treated in innovation research or leadership research but they are still two distinct subjects in the research world. The direct link between innovation and leadership has been studied only recently by few researchers. Nowadays, leaders in organization need to evolve in a very competitive world where innovation is a key success factor; this environment is very challenging for leaders in order to fulfill their missions. That is the reason why only personal traits or managerial skills are not sufficient to define leaders in innovation. A certain combination of traits and skills is necessary to understand the impact of leaders’ characteristics on innovation process and success. Traits and skills are different; the traits are linked to the personality, while the skills are the ability to do something. A leader can own certain traits that can allow him or her to develop some skills, or it also happens that some skills are developed independently from the traits of the leaders. So, traits and skills can both impact the innovation process and success, whether separated or linked. Some researches have been written about leaders’ characteristics and innovation but the combination of traits and skills to define leadership characteristics in innovation has never been written yet. That is why we will try to complete the research in this area.

1.2 Research question

Thus, our gap relies on the fact that further research need to be conducted about leadership in innovation, and especially about leaders’ characteristics in innovation. Hence our research question: What are the characteristics of leaders when managing innovation in organization?

1.3 Purpose

The purpose of this study is then to try to fill the gap that we have observed, by answering this research question. We will attempt to review the current literature about innovation, traits and skills theories related to our topic and summarize the main findings. Our aim is to complete the research in leadership in innovation by recognizing and describing leaders’ characteristics in innovation as a combination of traits and skills. Then, we will interview leaders in innovation from companies in Sweden, and try to relate our theoretical findings with these empirical observations.
1.4 Outline of the study:

**Introduction**

The introduction will provide to the reader backgrounds about the research and expose the research question and the purpose of the study.

**Literature review**

In this part, the literature and theories we will use for the study will be presented about innovation, traits and skills.

**Methodology**

In the methodology part, the research philosophy & approach will be explained, then the research design and data collection methods, and to finish the ethical considerations and limitation of the study.

**Empirical observation**

In this part, we will describe and present the data gathered thanks to interviews we will conduct.

**Analysis**

In the analysis, we will compare the knowledge we have get from the literature and from the empirical observation. We will complete the literature with the findings of the interviews.

**Conclusion**

In the conclusion, we will answer our research question while summarizing the findings of our research.

*Figure 1: The structure of our research*
2 LITERATURE REVIEW

This literature review aims to introduce different theories and models that are directly concerned with our research. Innovation and leaders’ characteristics are the core subject of our study. It is necessary to have an overview and a presentation of previous researches in innovation, leader’s traits and leaders’ skills. The innovation theories and models are necessary to understand well in which environment and situation leaders in innovation evolve. We will distinguish different types of innovation, and explain the different stages within the innovation process. Leaders who evolve in this specific and complex context require different traits and skills. Then, we are going to review first the main influential and current researches about traits and finally the different theories that researchers have used in order to classified and define leaders’ skills. These parts will be essential in order to analyse our subject and answer our research question.

2.1 Innovation and innovation process

In this first part, we will have an overview of the different types of innovation in order to understand what issues or challenge could a leader need to face in low, medium and high degree of innovation. Understanding the differences between the three types of innovation that companies can develop is crucial for us in order to know in which context leaders are working in. Then we will have a view of the innovation processes in order to help us to understand how complex is an innovative project, which steps a leader needs to follow and what are the responsibilities of a project leader through the process. This literature will help us to identify in what context leaders in innovation are evolving, and the different types of challenges they need to face during all the innovation process.

2.1.1 Innovation types

It is important for us to define innovation and have a clear view of what types of innovation leaders need to be able to manage. Explaining the context of innovation is also important for us in order to understand in which context leaders evolve. When we will interpret what leaders would tell us during the interviews we will conduct; it would be essential to understand quickly in which context they are working. This will help us afterward in our analysis to know if these different degrees of innovation are important or not in leaders’ characteristics. During our readings, we have distinguished three main types of innovation. We can classify them depending on the degree of innovation or the degree of newness of a product, from low degree of innovation to high degree of innovation. The most common one in companies is low degree of innovation, followed by medium degree and then high degree of newness. This is crucial for us to link these three types of innovation to our subject and to leaders’ characteristics. Indeed, we will see that these innovations are closely linked to the types of characteristic a leader needs to own, from basic ones for low degree of innovation to more specific in higher level of innovation.
Characteristics of leaders in innovation

**Low degree of innovation**

Every company has a core product or a core service that is completed by features, options, or extra services. Through time, this product will need to be adapted to its market depending on market changes, corporate global strategy, competitors’ decisions, or customer new expectations. This context will obliged the company to do incremental changes for existing products. These changes have only some small impacts on the general organization of the company and manufacturing process. They require only few resources and low investment (Wheelwright and Clark, 1992, p. 5). This type of innovation is present in every company, so most of leaders in innovation have to deal with this small type of innovation. The fact that these changes need only low resources and investment means that most of the decision must be taken by project leaders or other managers working on the project, but not by top and senior managers. Moreover, these innovations are basically more technical changes or design changes that involve mainly the R&D function of the company. The aim of this kind of innovation is to focus on existing markets and existing products in order to limit heavy investment. These derivative innovations are usually focused on successful products that need just small adaptation for a better customer satisfaction (Moore, 2005, p. 64). This kind of innovation can be done during the whole product life cycle but they are more common during the growth phase and mature phase. These innovations have for goal to improve continuously the quality and the level of product in order to stay competitive and keep the customer active and interesting into the product (Moore, 2005, p. 66). Products which ask low degrees of innovations involve less time and stages than high innovative projects during the development process, but they also need to be taken seriously and have a progressive and planned development.

When a company creates new projects to add new features to a product or improve an existing product, it must be done very quickly and decisions have to be taken in a short time in order to fit the demand as soon as possible. The decision is also made in a lower hierarchic level and the project involves only a small number of people. This is very important for our research to know what the innovation impact in the company is and how leaders manage it. In the case of low degree of innovation, the leader should not need superior strategic skills or traits, but he or she should need more practical and quick adaptability in order to bring into the market the new product and then satisfy the demand. Moreover, this kind of innovation is usually decided by customers. After a period of trial, they raise some problems that need to be solved (Deschamps, 2005, p. 37). The analysis of the different leaders we will interview obliged us to a complete understanding of the innovation they are working in. If we do not distinguish low degree of innovation to higher level of innovation, we will certainly make mistakes in our analysis, and it will probably bring us in wrong conclusion. Innovation has as objective to bring something new, but everything new brought changes. The more the innovation is new, the more the changes are important in the organization but also outside the organization, for the market and for other stakeholders. Low degree of innovation bring small changes to the existing products and also small changes in the organization and its environment, and consequently lower responsibility, less skills and different traits.

We will see now what the improvements in a medium degree of innovation are, what kind of changes they involve, and what new responsibility and characteristics leaders in
innovation need to have.

**Medium degree of innovation**

Most of the companies have low degree of innovation that are just basic improvements in to their product, but many companies need also sometimes to make more fundamental changes and improvement to their products instead of only incremental changes. This medium degree of innovation involves more than a change of one dimension of the initial product and these changes not only include one function of the company but usually need several ones (Wheelwright and Clark, 1992, p. 74). When we compare to low level of innovation, where mainly one function is involved, where decisions can be done by project manager, and where the time to market is very short, medium level of innovation takes longer time and also higher level of decision making. Medium innovation needs to be made at upper level, with more discussion and meeting between different functions. This is important to distinguish a project that includes only one function from a project that includes several ones in order to make bigger changes in the product. A leader working with a medium degree of innovation will need to develop skills and traits that will permit him or her to work with different functions, get enough knowledge to discuss and interact with other companies or department inside the company he or she is working in. Medium degree of innovation is usually an evolution from one generation to another; this is not a radical change that needs a very high sales and marketing support, but it has enough impact to create some organization changes and important investment decision. These innovations make smooth improvement that does not affect customers so much, customer still recognize the product and the main function and uses of the product are still the same. This medium degree of innovation usually offers to the company a significant competitive leverage and a better market penetration and growth (Wheelwright and Clark, 1992, p. 74).

It is important to know what impact the innovation to different stakeholder has. These medium types of innovation include also the development of new markets for existing products in order to find new uses for them. In order to improve and make several changes in the product, the company also can call some partners that will complete the value chain. This can be important for leaders to know how to find new partners and have perfect relationship that reach to a successful project. The leader will need then important relationship and communication skills in order to interact with others (Deschamps, 2005, p. 37). The fact that with this new product, the company will reach new market and also new customer will oblige leaders to have close relations with sales and marketing department. This knowledge is crucial for us also to interpret and analyse the behaviour of the leader and his or her way of working. For example, if a leader is working in a medium degree of innovation project and needs to create big changes in the organization and invests a lot, we will be able to ask him or her more and understand better the context. If we do not structure the innovation type first and get sufficient knowledge, we could not have good exchange, observation and analysis during and after our interviews. Knowing the difference between low and medium degree of innovation will help us to distinguish basic skills and traits that every leaders own in a lower hierarchical level when they deal with lower innovation, and then add more skills and traits that are used in bigger innovations.
High degree of innovation

When a company is created or when it needs to get a significant turn in its history, company needs to create a new product, a new service, they need to invent and create something totally new. These innovations involve significant and major changes to companies’ portfolio. These new products differ fundamentally from previous product generations, and create entirely new product categories and markets. These totally new products usually require revolutionary manufacturing process combining with new technologies and materials. Top management has to give to the product and R&D teams significant resources in order to design the new processes until getting the product to the market (Wheelwright and Clark, 1992, p. 74). These innovative projects can be also qualified as Research and Development projects that create a new know-how and know-why of new materials and technologies. These projects are precursor to product and process development. The R&D projects usually compete with commercial projects that are less risky in term of investment but a close relationship between R&D and commercial projects is also essential in order to balance project mix and to help the easy conversion of ideas to commercial products (Wheelwright and Clark, 1992, p. 75).

After learning that most of innovations can have a small or medium impact to the entire company and its environment, it is important for our study to have a look on the types of innovation that have high level of newness, impacts and changes in the organization. According to what we have read, we would assume that when a decision is taken to create an entirely new product, which involves significant change inside and outside the company, leaders in innovations need to have more skills and very important personality traits in order to bring this heavy, expensive, long term project to the market, and make it as successful as possible. We have seen that with a low degree of innovation, projects involve a limit amount of people and financial investment that create very limited risks. With medium degree of innovation, projects involves more function in the company, more financial resources and more risks, that can have a relative impact to the company in case of failure but still limited. With high degree of innovation, projects involve very deep change in organization, product line and companies environment. In case of failure, the project will have high consequences in term of finance and competitive advantages. This can bring the company to fire employees, lose market shares, lose trust from customer and in extreme bring the company to bankruptcy. That is why when describing leaders’ characteristics in this type of project, it is very important not only to use characteristics found in low and medium innovative project leaders, but we must think that we need to find other characteristics depending on these high expectation projects. These higher types of innovation reach important R&D expenses and important market risks. That would require from leaders in innovation visions and strategic skills, which usually are more common with senior managers and leaders.

When companies implement a strategy of innovation, they rarely conduct only one project. In term of innovation, project mapping is necessary in order to know what the degree of change in the product is and what the changes it implies are in the manufacturing process and also in the company’s (Wheelwright and Clark, 1992, p. 73).
All of these three types of projects need a combination between resources and management style (Wheelwright and Clark, 1992, p. 73-74). We have decided to choose innovation as our main focus because it is a very captivating subject but also a complex one. Thanks to this knowledge and distinction between these types of innovation, we will be more capable to understand, to rebound and to find out in our future interviews, observation and analysis about leaders in innovation, what are the characteristics that define leaders depending or not on the kind of innovative project they are involved in. From low degree of innovation to high degree of innovation, leaders will need to use particular skills and also use their own personality through their traits in order to manage the innovation and bring it to success. These distinctions between three different scales of innovation will let us to highlight what are the basics skills and traits leaders in innovation need in incremental project, then which other characteristics will be requested when managing bigger changes and adding ultimate characteristics that will help them to create an entire new products from the idea to the market.

That is why, it is very important of us to understand and visualize what are the different steps leaders in innovation will pass through, what decisions they will need to take, and what characteristics are more present throughout the process of innovation and do not just see the project one thing but more something that includes many aspects and phases.

An innovation is a process that is most of the time managed as a project. That means that leaders in innovation will need to deal with a project that is composed by different steps and gates where they need to take decisions and have different responsibilities. The fact that leaders in innovation manage a process will ask them to use different types of skills and traits throughout this process.

2.1.2 Innovation process

In every company, in every types of project of innovation, from low degree of innovation to high degree of innovation, every leaders will need to plan the process thanks to stages and gates. Each stage will be a new step in the innovation progress, and each gate or milestone will be a control point where leaders will check if the project is running well and is able to continue (Cooper, 1990, p. 45).

Usually a stage-gate system is composed by four to seven stages and gates, depending on the complexity of the innovation or the company structure from the preliminary assessment to the full production and market launch. At each stage, the degree of expense is increasing that makes the decision maker very careful in order to continue or stop the project (Cooper, 1990, p. 46). Depending on the size of the project and the degree of innovativeness, senior managers or project leaders, surrounded by a team representing functions involved in the innovation, act as gatekeepers who have the authority to approve the resources needed for the project. Project leaders bring projects from stage to stage, and gate to gate. They are aware of what criteria are required in order to pass the next gate and structure their team to meet the determined criteria for reaching each gate (Cooper, 1990, p. 47). For low degree of innovation, the process will be shorter and will ask time from the idea to the implementation into the market of the product. The process of a small project will be confronted to less barriers and lower
level of decision making at each step. For higher degree of innovation, the process will be longer, the decisions more difficult to take and at a higher hierarchical level, with bigger barriers and problems to solve during all the process.

Here is an example of innovation process, from the idea to the market and also post implementation review.

![Innovation process diagram]

Figure 2: Innovation process  
Source: Cooper R.C, 1990, p. 46

If we go through the innovation process, we can distinguish quickly what different stages a leader in innovation must manage during the process. This knowledge will be helpful for us in order to understand better what the work of leader in innovation is and how the different steps of the process will ask him to highlight different skills and traits of his or her personality.

The first part of the innovation process is **preliminary investigation**. In this stage, leaders need to determine the project’s technical and marketplace objectives. In this moment of the project, the team and the leader need to make a quick and simple study in order to determine market size, market potential, and possible market acceptance, that oblige the leader to work closely with marketing and sales department. Here, leaders will need to have technical knowledge in order to have a quick evaluation of the project planning and feasibility (Cooper and Kleinschmidt, 1993, p. 26).

After having identified the improvement to make the new idea, the project needs **deeper investigation** where leaders will need further skills to conduct with marketing department marketing studies, competitive analysis, technical appraisal, which will determine the feasibility of the project from an economic and technological point of view and also detailed financial analysis. For this stage, leaders will need to add to their marketing and technical skills, legal and financial skills in order to investigate deeper in relationship with other functions of the company such as marketing department, legal department, R&D, and financial department (Cooper and Kleinschmidt, 1993, p. 26-27).

After preparing the field and be sure that the product is the right for the customer; that the product will be profitable and technically feasible, the product enters in the **development phase**. Here the innovation project enters in an intensive technical work
where teams will make a prototype of the new feature or entirely new product. Indeed, at this stage, the relationship with the customer is increasing with market analysis and customer feedback, as the product takes shape in a technical way. Until the lab-tested prototype, the project teams and leaders need to continue to update and revise financial and legal analysis (Cooper and Kleinschmidt, 1993, p. 27). This is a very important phase into the process, because the idea comes to reality and the creation become tangible. This step is the continuation of very precise investigation and environment analysis. And at this stage, leaders can already see what the future product will look like, imagine what will be the reaction of the customers, and visualize also the impact on the market. Leaders need to manage time very precisely, help to solve technical problems, have the ability to react and manage team together. In an entirely new innovation, the leader will need during this phase to imagine what the future production line will look like thanks to the problems he or she has faced (Wheelwright and Clark, 1992, p. 28). For more incremental change, as feature change, leaders will need to think more about the integration of the new feature into the product and also how they will bring this new feature or generation into the market in order to keep their customers and reach new ones.

After developing the project and the new product, it enters in a testing and validation stage. This phase has as objective to test and validate the entire project, the product itself, the production process, customer acceptance, and the economic part. If in every phase, the project has been conducted well, this testing and validation phase is only here to fix some small details and does not ask the leader too many efforts. Here the new product is presented to all the team involved and also in case of big project to the head of the company in order to give the agreement to go to the next step that is full production and market launch. If the marketing has been well done, the customer informed and involved during all the innovation process, the commercialization of the product is easier and includes only a marketing launch plan and a production or operations plan (Cooper and Kleinschmidt, 1993, p. 28).

When entering into the market, it is important for leaders and also for the team to get post-implementation review during a while. At this moment, managers and leaders review the project’s performance in order to assess its strengths and weaknesses. Here is the experience moment of the product, when everything is over, the company and its leaders need to learn about what happened during the innovation process and what they will do better next time (Cooper and Kleinschmidt, 1993, p. 28). At this point, the success or the failure of the project is determined after the first results and the first market and customer reactions. It is important at that moment, that the leader gets all the experience of the project whatever the size of the project and whatever the result of the project. If it is successful, leaders must learn why it has been successful and see what was wrong and what were the problems they needed to face, in order to keep improving their skills and use better their personality traits to bring next project successful.

Each different type of innovations, as well as the stages in the innovation process, would require different leaders’ characteristics. Indeed, a leader will not act in the same way according to the situation. The context of innovation is quite complicated, and each
situation will require different traits and skills. The degree of innovation of a project will determine which skills and personal traits a leader will use during the innovation process. If the project has a low degree of innovation, leaders will only use one part of their skills and traits, and bigger is the innovation degree; bigger will be the amount of skills and traits leaders will involve in the project. In parallel, we need to keep in mind that every innovation is a process, no matter the size and the degree of change the project involves. During all the process, leaders in innovations will need to have certain knowledge, certain skills and highlight certain personal traits at each phase of the project or during all the process. Certain skills or traits will appear at one stage, and some will appear during the entire process. It is crucial in our research to know that a leader needs to pass through different phases in order not to forget some skills and traits.

### 2.2 Leadership traits and skills theories

In the following parts, we will review what the leadership traits and skills theories are. In order to clarify the purpose of our research, it seems important to us to first distinguish a trait from a skill. Indeed, we assume that a distinction must be done, in order to answer our research question.

A trait can be defined as a general personality trait that is observable both within and outside the context of work (Dubrin, 2010, p. 33). For example, a trait that can characterize leaders in innovation could be the fact that they are creative. It is a trait that you can observe outside the context of work, in the private life of the leader, but it will also appear at work.

Whereas a skill can be defined as the ability to do something well (Oxford dictionary, 2011). Contrary to the traits, the skills are not focused on the personality characteristics, but they put an emphasis on what can be learnt and developed.

#### 2.2.1 Leaders’ traits

In this part, we will review what the leadership traits theory is; how it has evolved through time, what are the main common traits of leaders that have been identified, and what are the traits that have been currently observed in the literature for leaders in innovation. It is important for us to make this review as it helps us to understand better our research question. Indeed, it would help us to clarify what is the role of traits in the leaders characteristics, what are the common traits that can define a leader, and if some traits of leaders in innovation are different than the common traits of leader.

**History of leadership traits approach**

**Early twentieth century: The great person theory**

First of all, we will define what is the leadership traits approach. The leadership trait
approach globally assumes that leaders possess some characteristics, some traits that enable them to become leaders. Thus, according to the leadership trait approach, leaders in innovation would have particular traits that enable them to emerge as leaders and be efficient in their work.

Throughout the twentieth century, the trait approach was one of the first systematic approaches to study leadership (Northouse, 2010, p.15).

The trait theory began in the early twentieth century with the “great person theory”. This theory assumed that some traits made people great leaders. In other words, it was believed that some people were born with some specific traits of leaders. For example, Julius Caesar, Joan of Arc, Napoleon Bonaparte, Indira Gandhi are cited as natural great leaders; they are said to possess the innate qualities and characteristics, a set of personal qualities, that enable them to emerge and be successful leaders (Northouse, 2010, p.15 Pierce and Newstrom, 2010, p. 63).

Mid-twentieth century: The great person theory challenged, the importance of the situation

Later, in the mid-twentieth century, a critical question about the universality of leadership traits was raised (Northouse, 2010, p.15, Pierce and Newstrom, 2010, p. 63). The trait approach was challenged to know if leaders possess a common set of traits that give them the characteristics of leaders.

Ralph Stogdill in 1948 conducted one of the major researches about leadership, which was complemented in 1974. This study has brought a major twist in the leadership trait approach while challenging the great man theories.

In the first survey, in 1948, Stogdill made a major review of the literature in order to identify and summarize the personal factors associated with leadership. He analysed and summarized more than 124 trait studies conducted between 1904 and 1947 and identified a large number of descriptive traits of leaders. He classified the most important traits he observed under the following headings (Stogdill, 1948, p. 64):

- Capacity (intelligence, alertness, verbal facility, originality, judgement)
- Achievement (scholarship, knowledge, athletic accomplishments)
- Responsibility (dependability, initiative, persistence, aggressiveness, self-confidence, desire to excel)
- Participation (activity, sociability, cooperation, adaptability, humor)
- Status (socioeconomic position, popularity)

The study of Stogdill also reveals that the fact that even if some individuals possess the characteristics of leaders, this does not make them necessarily leaders. It depends on the situation; some traits are more relevant in a situation than in another one. A leader in a situation is not necessarily a leader in another situation. A person does not become a leader simply because he or she owns the key traits of a leader. Leadership would be determined mainly by the situation, and less by the personal factors. Moreover, Stogdill (1948, p. 66) observed that leadership is not passive but comes from a working relationship between the leaders and the group members. Thanks to their activities
inside the group, the leaders acquire a status inside the group, which give them the role of leader. As we have seen earlier in the innovation part, the context of innovation is really specific and requires some specific characteristics. It confirms that the situation of a leader is as much important as his or her own characteristics.

In his second study in 1974, Stogdill analysed 163 studies conducted between 1948 and 1970, and compared the new results with the previous ones. This second research argues that both situational and personal factors are determinant of leadership. Traits and situations are more balanced than in the first study, which assumed that situational factors were the principal ones. Thus, it can be assumed that this second study comes back to the original trait approach, which states that leaders’ characteristics are part of leadership. Stogdill (1974, p. 81) provides in this second survey the following traits and skills linked with leadership:

- Drive for responsibility and task completion
- Vigor and persistence in pursuit of goals
- Risk taking and originality in problem solving
- Drive to exercise initiative in social situations
- Self-confidence and sense of personal identity
- Willingness to accept consequences of decision and action
- Readiness to absorb interpersonal stress
- Willingness to tolerate frustration and delay
- Ability to influence other people’s behaviour
- Capacity to structure social interaction systems to the purpose at hand.

This major review assumes that no consistent set of traits would differentiate leaders from non-leaders across different situations. It reveals that a large number of traits emerged as descriptive of leaders, but they must fit with the situation. Thus, leadership is no longer said to be only a quality, or some traits that people possess, but it takes into account the role of situation.

According to the observations made by Stogdill, a leader in innovation would own particular traits. However, leaders are not born as leader, but they emerge as leader according to the situation. Following this statement, a leader in innovation could have some particular traits that can give him the possibility to become a leader in an innovative context. In this sense, we can argue that leader need to develop skills based on their traits to become a leader, which can help them to emerge as a leader in the particular context of innovation.

In 1959, Mann conducted a survey examining more than 1400 findings concerning the relationship between personality variables and status or behaviour variables in small group. This study focuses more on the association between personality and leadership, than on the role of situation. Nevertheless, the role of situation is not rejected. Mann identified six major traits of leadership (1959, p. 257): intelligence, adjustment, extroversion, dominance, masculinity and conservatism.

Some of these traits are similar to the ones found by Stogdill. For example, intelligence and adjustment identified by Mann can be linked to the heading “capacity” identified by Stogdill in 1948. Also, what Mann named as dominance can be linked to “drive for
responsibility and task completion”, as well as “drive to exercise initiative in social situation” defined by Stogdill in 1974. So, we can argue that it seems possible to assume that some common traits of leader could exist, which helps us to define a leader.

In 1986, Lord, DeVader and Alliger have reviewed the study conducted by Mann in 1959 using the meta-analysis technique of validity generalization (Lord et al., 1986, p. 402). They came to the conclusion that leadership perception was significantly correlated with intelligence, masculinity, and dominance (Lord et al., 1986, p. 407).

Thus, the studies made during the mid-twentieth century have challenged the great man theory as they emphasize the role of situation in the emergence of leaders. Even if these studies define common personality traits of leaders, they assume that these traits can help people to become a leader only if they fit with the situation. In other terms, traits are not the only factors that make individuals become leaders, but they must also be able to develop skills based on their traits that fit with the situation in order to become leaders.

From the end of the twentieth century to today: Re-emphasize of traits

After having dominated the initial decades of scientific leadership research, leadership traits theories were disdained due to their inability to give a clear distinction between leaders and non-leaders and their inability to take into account situational variance of leadership (Zaccaro, 2007, p. 6). Recently, trait-based approach benefits from resurgence (Northouse, 2010, p. 16), with some influential researches that we will review in this following part.

First, contrary to the previous researches, Kirkpatrick and Locke assume that “leaders are not like other people” (1991, p. 59), they have identified some traits that they call the “right stuff” which are not present in all people (1991, p. 59). These traits are “preconditions” that give people the possibility to become effective leaders (1991, p. 49). They assume that leaders are different from non-leaders through six traits: drive, leadership motivation, honesty and integrity, self-confidence, cognitive ability and knowledge of the business (Kirkpatrick and Locke, 1991, p. 49).

Judge et al. (2002) have conducted a study about 78 leadership and personality studies published between 1967 and 1998. They have based their study on the Big Five factors model, which is a consensus that has emerged among researchers about the most important factors that constitute personality (Goldberg, 1990, p. 1216). The dimensions of the Big five factors model are neuroticism, extraversion, openness to experience, agreeableness and conscientiousness (Judge et al., 2002, p. 767).

The result of their study demonstrates that a strong link exists between the traits of personality and leadership. Extraversion is said to be the factor the most related with leadership, followed by conscientiousness, openness, and low neuroticism. Agreeableness is less correlated with leadership (Judge et al., 2002 p. 765).

From the 1990’s, leadership traits approach is associated with the concept of “social
 intelligence”. Marlowe (1986, p. 52) defines it as “the ability to understand the feelings, thoughts, and behaviours of persons, including oneself, in interpersonal situations and to act appropriately upon that understanding”. This ability is said to be a key trait for effective leaders. Zaccaro, Kemp and Bader (2004, p.118) included it in their research. Indeed, they have summarized the important leader attributes by categories that have received empirical support from 1990 to 2003. The categories related to the traits are the following. First, one of the categories is about the cognitive capacities and includes general intelligence, as well as creative thinking capacities. Then, the second category is about personality, with elements such as extroversion, conscientiousness, emotional stability, openness, agreeableness. The third category is about motives and needs and includes the need for power, need for achievement, and motivation to lead. The fourth category is about social capabilities, including social intelligence, emotional intelligence and self-monitoring.

Through time, the trait approach has raised lots of interest among researchers who attempt to observe which traits characterize leaders, and how they can influence leadership.

To sum up, after emphasizing on the key traits of great person, the trait approach has put more focus on the impact of situation, to finally re-emphasizes the role of traits today, but without totally rejecting the importance of the situation. Thus leadership traits approach is still alive today.

It is important to understand the history of leadership trait in order to make clearer the purpose of our research, by understanding what are the main traits of leaders that have been defined

In order to facilitate our investigation, we have decided to summarize the different traits that were defined through history in the following table. This would help us to understand what are the most common traits of leader.
### Characteristics of leaders in innovation

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Capacity</strong></td>
<td>Intelligence</td>
<td>Drive for responsibility and task completion</td>
<td>Intelligence</td>
<td>Drive</td>
<td>Extraversion</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Adjustment</td>
<td>Vigor and persistence in pursuit of goals</td>
<td>Masculinity</td>
<td>Motivation</td>
<td>Consciousness</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Extroversion</td>
<td>Risk taking and originality in problem solving</td>
<td>Dominance</td>
<td>Integrity</td>
<td>Openness</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dominance</td>
<td>Drive to exercise initiative in social situations</td>
<td>Confidence</td>
<td>Confidence</td>
<td>Openness</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Masculinity</td>
<td>Self-confidence and sense of personal identity</td>
<td>Cognitive ability</td>
<td>Cognitive ability</td>
<td>Neuroticism</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Conservatism</td>
<td>Willingness to accept consequences of decision and action</td>
<td>Task-Knowledge</td>
<td>Task-Knowledge</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Achievement</strong></td>
<td>(scholarship, knowledge, athletic accomplishments)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Responsibility</strong></td>
<td>(dependability, initiative, persistence, aggressiveness, self-confidence, desire to excel)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Participation</strong></td>
<td>(activity, sociability, cooperation, adaptability, humor)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Status</strong></td>
<td>(socioeconomic position, popularity)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Table 1: Summary of main leader’s traits*
The review of these main findings about leadership traits demonstrates that the study of particular traits is not easy. Indeed, some traits appear in different studies, whereas others just appear once or twice.

**Basic leaders’ traits**

So what can we retain from all these studies as main traits of leaders? And how can we use the findings of all these studies to answer our research question?

We have chosen to retain four types of traits that appear to us to be the most common traits of leaders. This list of main traits will be useful in the analysis of our empirical data. It was necessary to review the main influential studies that have been made about traits, in order to define those that appear to us as the most relevant and will appear during our interviews.

First, we assume that **cognitive abilities** are one of the main leader traits. This trait appears first in the study of Stogdill (1948) under the heading “capacity”, then in the studies of Mann (1959) and Lord et al. (1986), as intelligence. Finally, this trait appears in the studies of Kirpatrick and Locke (1991) and Zacarro et al (2004), as cognitive ability and cognitive capacity. We define cognitive abilities globally as the intelligence of the leader. It regroups the ability to analyse a situation, the verbal ability, perceptual ability, judgement, and so on. We assume that intelligence is one of the main traits of leader. Indeed, Zacarro et al (2004, p.110), state that leaders tend to have a higher intelligence than non-leaders.

The second trait that appears to us as essential is **confidence**. We believe that the leader needs to be self-confident, and also must release, inspire confidence, make the others confident. The leader must be self-confident enough to take decision, and to assume the consequences of these decisions. If leaders are sure enough of their decision, the non-leaders would trust the leaders and support their decision. This trait appears in the study of Sogdill in 1948 and 1974, first under the heading “ responsibility”, and then simply as “self-confidence and sense of personal identity”. It appears also in the study of Kirpatrick and Locke (1991), as “self-confidence”, and we also argue that the idea of releasing confidence can be linked to the idea of integrity and honesty from this study.

Then, we assume that the leader must be someone **sociable**, extravert. This trait first appears in Stogdill’s research of 1948, under the heading “participation”. It also appears in Mann’s research (1959), as extroversion, and in Zacarro et al (2004), as social capacities and personality. The leader must have the capacity to go towards people, and can have characteristics such as being diplomatic, empathic, tactful… These characteristics can enable the leader to create good relationship with the non-leaders, and thus influencing their behaviour.

Finally, we think that leaders must be **determinate**. They must believe in their projects, and must have the desire to accomplish them well. It requires traits such as drive (Stogdill, 1974, Kirkpatrick and Locke, 1991) or dominance (Mann, 1959, Lord et al, 1986), that appear in the previous table.
Characteristics of leaders in innovation

To conclude, as mentioned before, it is not easy to define traits of leaders. However, some of the traits seem to appear more than others, hence the most common traits that we have chosen to define. The identification of these common traits will serve us as a kind of framework to analyse our empirical data. We suppose that other traits could be found and added to these ones, especially in the innovative context.

That is why we have chosen to review the current literature about leaders’ traits in innovation, in order to observe if some traits could be added to the basic traits that we have observed. Indeed, the assumption that some personality traits are preconditions for individuals to become a leader led us to wonder if leaders in innovation would have some specific personality traits depending on the innovation context.

Current research of leader’s traits in innovation

Do leaders in innovation possess different traits than other leaders? This question has raised a recent interest among researchers. We have chosen to present the researches that appear to us as the most relevant recently.

Dubrin (2010, p. 351) states that leaders in innovation are different from their less creative counterparts. He has defined the following characteristics of leaders in innovation. According to him, the leader must have first certain knowledge about a wide range of information. Second, the leader is supposed to have cognitive abilities, such as the fact that he must be highly intelligent, intellectually curious and able to think divergently. Third, concerning his personality, that is to say, his traits, he should have a tendency to be non-conformist, self-confident, thrill seeking, energetic, and persistent. Finally, in order to emerge as an effective leader, individual must be passionate for the task and flow. Flow is defined as the fact that the passion for the task and high intrinsic motivation contribute to a total absorption in the work and an intense concentration (Dubrin, 2010, p. 355).

If we define traits as personal characteristics that are observable inside and outside the work context, we can assume that knowledge and passion for the task are not really traits, but rather some skills that the leader can develop.

Roland Bel (2010, p. 47-48) declares that “a good innovation leader is characterized by the ability to excel on the apparently conflicting skills of creativity and discipline”. He defines some attributes that characterize a good leader in innovation that can be linked with some personal traits. The personal traits that Bel observed for leaders in innovation are will and humility. Indeed, good leaders in innovation are conscious that there is no existing recipe to lead to future success (Bel, 2010, p. 50), which make them aware that they need to constantly adapt themselves to the context.

Adair (2007, p. 63) assumes that the attitudes, the personal qualities and skills of leaders are important ingredients in innovation. According to him, the personal traits that can characterize leaders in innovation are the following. First, the leader should have the ability to think deeply, which is linked to intelligence (Adair, 2007, p. 67). Then, he should be able to communicate (Adair, 2007, p. 67). And finally, he should have the ability to make things happened (Adair, 2007, p. 68).
The different traits of leaders in innovation that we have found, can be summarized in the following table:

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cognitive abilities (intelligent, curious, ability to think divergently)</strong></td>
<td>Creative and discipline abilities</td>
<td>Ability to think deeply</td>
</tr>
<tr>
<td><strong>Non-conformist</strong></td>
<td>Will</td>
<td>Ability to communicate</td>
</tr>
<tr>
<td><strong>Self-confident</strong></td>
<td>Humility</td>
<td>Ability to make things happen</td>
</tr>
<tr>
<td><strong>Thrill-seeking</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Energetic</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Persistent</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Table 2: Summary of leader’s traits in innovation*

Through this table, we can notice that some traits of leaders in innovation are similar to the ones we defined for leaders in general. For example, cognitive abilities or self-confidence are traits that have been observed previously. In addition, some other traits seem to be more specific to leaders in innovation. These traits are first the ability to be creative, non-conformist, thrill-seeking. Then the leaders must also be able to think divergently, they must have humility and will, and finally to have the ability to make things happen. This leads us to assume that leaders in innovation could possess traits that are different from the common traits that leaders who work in a non-innovative context own.

Actually, few researches have been conducted about the personal traits that can define a leader in innovation. Most of the studies focus on the skills or abilities of leaders in innovation.

Nevertheless, the skills of a leader in innovation can be somehow linked to their personal traits. Indeed, the personal trait that an individual owns can enable to acquire certain skill. For example, if an individual were able to understand quickly, he would have more chances to develop a good knowledge of his field, which we consider as a skill.

Thus, we have found in the literature some skills that are closely linked to the personality traits.

First, there are the cognitive skills that Weber et al (2009) have defined. Managers need these skills in order to be creative, make sound decisions and solve problems inside the company (Weber et al, 2009, p. 356).

The cognitive skill is similar to the cognitive abilities that we have found before and define as a trait. Indeed, we argue that this ability corresponds to our definition of trait, which assumes that personality traits can be found in and outside the work context. Thanks to this ability, the leader will develop skills that can allow him to make sound decisions, or to solve problems inside the company (Weber et al, 2009, p. 356).
The distinction that we have made between traits and skills is not always obvious, and is not so clearly made currently in the research field.

In innovation, leaders need to be creative, not only for finding the initial idea of a project but also for managing the project through the process when facing obstacles and major issues. The creativity, pertaining to the cognitive abilities, is one of the key factors of solving problem or getting out from bad situation. Moreover adding knowledge skills to creativity and problem solving skills is important for managers in innovation for solving the project in a really short time.

Then, we have found some personal skills that are closely linked to the personality traits. For example, the capacity to motivate and sustain people into a project is a skill that a leader has to develop, closely linked to his traits. For example, if the leader is a rather enthusiastic person, it can enable him or her to develop the communication or relationship skills that could help him or her to motivate his or her team.

Moreover, a leader might have the responsibility to deal with problems occurring within or outside the company and has to solve them. The leader can manage these issues thanks to several ways that can necessitate his or her personality traits.

First, leaders can manage as an example. That means that their team members will observe all of their actions. In this case, leaders must have some traits and skills that are important for their team such as honesty, straightforward when they work with the others and with the project (Murch, 2001, p. 15).

Second, a leaders need to have a positive attitude, even when there are important difficulties, problems, or project obstacles. If leaders have negative attitudes that will damage confidence of their teams and bring a bad influence to the entire project. We assume that it is easier for leaders to develop positive attitudes, especially if they are naturally positive persons, in other term if positivism is one of their personal traits (Murch, 2001, p. 15).

To conclude, the research about leaders’ traits in innovation has allowed us to complement the basic traits that we have defined, with new traits that are more specific to the innovative context. These findings will help us to analyse our empirical data. Indeed, when analysing them, we will look for traits related to the innovative context, and also we will try to understand better the combination between traits and skills. Moreover, we have observed that some traits are really closed to skills. However, we assume that a trait is different from a skill, as it is something that is linked to the personality. In addition, the traits can be considered as a kind of base that enables leaders to develop technical and non-technical skills.
2.2.2 Leaders’ skills

In this last part, we are going to highlight different leaders’ skills thanks to models and theories that have been developed. It is crucial for our study to identify skills that have been discussed in previous studies, and try to find out what category of skills are important to leaders in innovation. It will help us to understand what a leader is and help us to compare this literature knowledge with the observation of our interviews.

Thanks to our readings about leadership and skills, we can distinguish two major kinds of skills: technical and non-technical skills. It is important to make a quick distinction between them. “Technical skills are associated with the technical aspects of performing a job. These skills usually require the acquisition of knowledge, are primarily cognitive in nature and are influenced by an individual’s intelligence quotient source” (Weber et al, 2009, p. 354). Non-Technical skills are defined as the “interpersonal, human, people or behavioural skills needed to apply technical skills and knowledge in the workplace” (Weber et al, 2009, p. 354). Technical skills are the knowledge that leaders will get and non-technical skills are the skills that help leaders to use their technical skills in their specific working area. We need also to mention that both technical and non-technical skills are developed thanks to leaders personal traits. Indeed, traits are personal bases that help the emergence of skills.

Leaders in innovation evolve in a dynamic environment which requires competency in a broad range of skills, including not only technical skills, but non-technical skills as well. This distinction between technical and non-technical is essential in innovation, where the competencies demand is very important in term of knowledge and techniques in a very precise and complex area. The combination of different technical skills is needed to manage the innovation team (Gallagher et al, 2010, p. 144). Technical and non-technical skills have a high connection with each other and have also a high link depending on the degree of innovation. Indeed, as we have seen in the first part, the highest the degree of innovation is, the highest degree of responsibility of the leader is. As a consequence, the highest the degree of innovation is, the number of skills that a leader must own is most important.

**Technical skills**

Technical skills are considered as core to the innovative environment. These skills are those that a leader will have in order to work in the innovation. These technical skills depend on the types of innovation or the industry the leader is working in. If for example, leaders innovate in cars industry, they will need basic technical knowledge in cars. Moreover, when the innovation is bigger, and when leaders have more responsibilities, they will require more technical skills. They will need some basic technical skills in their working area, but also business management, organization and strategic skills when the innovation asks more responsibility and has bigger impact on the company (Gallagher et al, 2010, p. 145).

First, leaders will need to own some **basic technical skills** which permit them to enter into the field; they are basics for the area leaders are working in. These foundational skills are necessary in order to develop more advanced skills and capabilities in a more
advanced and specific area. For example, foundational skills could be the ability of programming in IT industry or in pharmaceutical industry, basic chemistry knowledge that would be necessary to manage small innovation process and then have the capacity to lead higher degree of innovation and responsibility. These skills are essential because they establish the basic knowledge that is required to enter in a particular professional area and to help to develop higher-level skills (Gallagher et al, 2010, p. 146). These skills are important in order to know what the innovation is about, what your teams are working on, and it also helps leaders to get a better understanding and an improvement of their rapidity of solving technical problems. This basic knowledge about the area leaders are evolving is necessary in every types of innovation. Leaders of low innovation need it to work with R&D department that is present in every project. Leaders of medium project need it for solving problems, understanding and communicating about the technical aspect of the innovation to other functions or companies involved in the project. Leaders working with high innovative project will need it to understand what is the innovation and what it brings to the company. They also need it for being able to understand the complexity of the innovation and plan it in a good way.

Secondly, when leaders get some responsibility in the company and need to manage innovation at a medium level, they will need to add some technical skills that do not depend on the specific industry of area they are working in. We call them Business management and organizational skills. These kinds of skills can be useful for a leader because they are not only useful in one type of industry. These skills can help the leader to manage different parts of the innovation process and understand better what other functions of the company do when working with them on an innovative project. These technical business skills and knowledge will influence managerial non-technical skills. This knowledge about business administration or business tools management will help the leader to manage well the innovation process and develop non-technical managerial skills. For example, if a leader has the competence to manage CRM systems or financial tools, it will help him or her to have a global vision of the project and not only the pure technical part of the project. It will also help him or her to have better communication with other functions of the company (Murch, 2001, p. 17). Business management and organizational skills are the knowledge that leaders get about running a business and organizing people or project. This is especially needed in medium degree of innovation and high degree of innovation where several functions of the company are involved and where the innovation process is more complicated and requires more changes in the organization.

Leaders in innovation require technical business administration skills also to be efficient during all the innovation process, working with different functions in the company but also when he needs to work with other companies from other industries. He will need also some economic and financial skills in order to manage risk, to estimate and control costs during all the innovation process (Murch, 2001, p. 17). Leaders need these skills for articulating goals, organizing people and resources, monitoring progress, and resolving problems (Weber et al, 2009, p. 356). This will help them to develop managerial non-technical skills and have better relationship and communication when they will need to have contact with partners from other companies and other industries. A leader in innovation will get these businesses and organization skills mainly thanks to education or training, but also thanks to professional experience he or she got.
In a higher level of innovation, leaders would need **strategic skills**. Strategic technical skills can be defined as the ability of the leaders to use technical tools to evaluate the company environment, to identify weaknesses and strengths or new opportunities. This will help them to have a clear vision of the short and long term strategy of the company. Adding to this environment scanning skills, a leader must be able to use financial tools in order to identify the future profitability of the innovation and re-evaluate it at each step of the innovation process (Gallagher et al, 2010, p. 146). These strategic skills are developed mainly thanks to experience and some educational knowledge. They are highlighted thanks to vision skills that characterize also leaders working in highly innovative project.

According to our readings about skills and innovation, we could say that in any kind of innovation, technical skills are needed. The amount of technical skills depends on one leader to another; some leaders prefer to have little technical knowledge about the projects they manage. They prefer to let the technical part to other and more specialized managers, such as programming managers or network managers. There is no rule for that, each leaders have their own view concerning the level of skills they need. It really depends on the type and size of innovation project, their structure, and resources available.

Of course, project leaders need to have the technical knowledge and skills needed to do their jobs in the right way. If the leader does not have these skills, they can get these technical skills thanks to training, being mentored or coached by a more experienced individual.

For large and complex innovative process, such as systems integration projects or multiple-year projects, the project deals often with many complex technologies that are hard for the project leader to manage. For smaller innovation and changes, leaders are often technical leaders. But for any innovation, leader are responsible for the entire project, and they will need also to find solutions to technical issues that can occur during the process (Murch, 2001, p. 16). For small innovation, only basic technical skills are needed, but when the project becomes bigger and the degree of innovation higher, the amount of responsibility of the leaders increases. That is why leaders will need to add to their basic technical knowledge, management and strategic knowledge and skills in order to manage high degree of innovation.

Basic skills are skills that are essential to any leaders whatever the type of the innovation they are working in. Business and organizational skills are less important for leaders working with low types of innovation but essential when they work on medium or high innovative projects. Strategic skills do not concerned lower and medium degree of innovation but they are crucial for a leader working with a highly innovative project.

When leaders own technical skills or knowledge, they need to use them properly to lead an innovation or success. For that, leaders in innovation will need to develop also non-technical skills.

**Non-Technical skills**

As we have seen previously in the literature, non-technical skills can be considered as the skills that help leaders to use the technical skills they got in order to do their work
properly. Most companies are more concerned about non-technical skill and expect their future leaders to have the skills needed to be successful in their organization’s environment (Weber et al, 2009, p. 354). The non-technical skills give to leaders the ability to understand, develop and deliver effective solutions to the company they are working in (Gallagher et al, 2010, p. 146).

First, it is important for leaders in innovation to get good relationship and communication skills whatever the type of the innovation. This is something all managers need in order to bring a project to success. These communication and relationship skills are very important inside the company but also outside the company. A leader in innovation needs to have relationship with his or her teams and also with company’s suppliers, clients and other stakeholders. Communicating with others and building relationships with stakeholders is determinant in order to negotiate and manage everyone expectations regarding solution requirements, innovation deadlines or delivery dates. With strong relationship skills, leaders in innovation can communicate and work well with others, and thereby develop and deliver technical solutions more effectively (Gallagher et al, 2010, p. 147).

Leaders need communication skills in order to have better relations with others thanks to good listening, presenting, verbalizing, and non-verbal communications skills. Usually, high communication skills reach to better job performance and they are also one of the determinant skills for a group when choosing their leaders (Weber et al, 2009, p. 356). Indeed, from an idea to a real product, it requires very high competencies to express to the team what they are doing and why they are doing it. Confusion and doubt are very present during the innovation process at every stage. That is why leaders need to listen to their team and partners and present them clearly where the innovative project is and where it goes. They are composed by the collection, the treatment, and the diffusion of information. These skills include oral communication skills as speaking in order to convey information efficiently and precisely in order to be understandable by peers or team easily and reach to the successful accomplishment of the task or mission. An active listening skill is essential to appropriately comprehend in order to achieve a complete understanding. Written communication skills are also fundamental in order to communicate to the audience specific messages. Reading comprehension skills are also essential to understand voluminous and complex written information. Another important cognitive skill describes also the capacity to learn and adapt. For learning and adapt themselves quickly, leaders need to get active learning skills. These skills will allow leaders to have a rapid knowledge about one subject and adapt their behaviours and strategies to deal with emergent, non-routine, and dynamic components of their jobs (Mumford, Campion and Morgerson, 2007, p. 156). Of course, even if communication skills are needed from all leaders in innovation, the more complex and the bigger is the innovation, it involves more and deeper communication skills.

Having relationship skills are very important for leaders in order to create a good energy, dynamism inside the innovation team and outside the team. It will keep the team members and everyone involving in the project committed in the good advancement of the innovation. In an innovative context, leaders require these skills in order to keep good atmosphere inside the organization and during all the innovation process. During the innovation process conflicts can occur inside the team or outside the team, leaders will need to solve them efficiently. They also need these skills in order to negotiate with others, to lead and work with their team, to provide to clients, customers
or peers services and advices, to resolve conflict between people and to keep faithful long term relationship with them (Weber et al, 2009, p. 355). These social skill requirements are high in innovative project because leaders need to interact with others every day and influence others to reach their mission and make the project and company successful. These relationships or social skills refer to social capacities, social judgment, social complexity and differentiation and human relationship skills. It is important in a project to coordinate the actions between people, to have the ability to negotiate, to reconcile differences among employees, and have the ability to persuade in order to influence others to accomplish more effectively goals and objectives (Mumford, Campion and Morgerson , 2007, p. 157).

**Managerial skills** are indispensable for a leader to develop with his team solutions, fulfill their mission and realize the global corporate strategy. These kinds of skills are very important to leverage firm-specific knowledge, to define goals and objectives for the company (Gallagher et al, 2010, p. 146). Projects have an important place in many areas and especially in innovation. As we have seen in the innovation part of our literature review, innovation is a process that is mainly managed as a project. That is why, leaders in innovation would need some project management skills that allow them to plan, organize, lead, and control activities and team involved in the project. Nowadays, with the globalization and the multiplication of international companies, projects are more and more involved in multiple locations, organizations, and often languages and cultures. This can require leaders to get deeper skills for managing multinational and multicultural teams (Gallagher et al, 2010, p. 147). These managerial skills will help leaders to implement the knowledge they have get in technical business and organization skills when working in the innovation process.

We can add **problems and opportunity skills** that are essential in innovation and especially in higher level of responsibility. These skills involve an understanding of the business environment at three different levels: functions, company, and industry (Gallagher et al, 2010, p. 147). These skills are essential to leaders and especially in innovation. Innovation process is the next step after identifying opportunities and during the innovation process, leaders need to have the capacity to identify and solve problems as quick as possible to pass gates and go to next stages of the innovation process. When leaders get lots of technical knowledge, they need to have the ability to solve problem in order to use their knowledge efficiently.

When projects are important and involve lots of change in the company, leaders in innovation need to have **vision skills** which enable them to have a global view of the system and the organization in order to understand the complexity of an environment, deal with ambiguity and doubt, and influence in the organization. These include the important skills of visioning in order to understand and picture how the system should work and have the ability to determine when important changes to the system have occurred or are likely to occur. This is highly linked to environmental scanning skills and the ability to identify the cause and the impact of global situation on business unit action. Leaders also need to recognize relationships among problems and opportunities in order to choose appropriate strategies to deal with them. Problem identification skills and strategic skills are important at this leadership scale (Campion and Morgerson , 2007, p. 157). These non-technical skills are essential in order to use properly the strategic skills and knowledge that leaders have.
Making a link between what we have learnt in the innovation & skills literature, we can assume that communication and relationship skills are skills that are essential to every leader when they deal with low level, medium level or high level of innovation. Managerial skills linked to business and organization skills do not concern much leaders working with low types of innovation but are essential when they work on medium or high innovative projects. When leaders in innovation need to work with high degree of innovation, they will need vision skills in order to implement their strategic skills.

All these technical and non-technical skills are essential in order to innovate. The innovation process from the beginning to the end asks different skills and could ask also several kinds of leaders. It is rarely possible for companies to take different leaders in the different stages of the innovation process. When a company wants to create a new product, companies wish to work with highly skilled leaders in order to have a unique leader from the starting idea to the launch on the market. These leaders can be project managers in case of small degree of innovation. In case of higher innovative projects that bring bigger changes in the organization, they can be part of top management board and can leverage their influence to get the support of top management groups (Deschamps, 2005, p. 35). When a company wants to improve customer solution or system, leaders require vision and implementation rigor skills. And when a company is willing to create a new/improved product, process or service offering, leaders must have the ability to build a team and manage it to produce at high speed (Deschamps, 2005, p. 37).

We have illustrated in the table below the kind of skills a leader would own, thanks to what we have learnt in the literature about leader’s skills and the degree of innovation.

<table>
<thead>
<tr>
<th>Low degree of innovation and responsibility</th>
<th>Medium degree of innovation and responsibility</th>
<th>High degree of innovation and responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technical skills</td>
<td>Basic skills</td>
<td>Basic Skills</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Business management and organizational skills</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Strategic Skills</td>
</tr>
<tr>
<td>Non-technical skills</td>
<td>Communication skills</td>
<td>Communication skills</td>
</tr>
<tr>
<td></td>
<td>Relationship skills</td>
<td>Relationship skills</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Managerial skills</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Problem and opportunity skills</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Vision Skills</td>
</tr>
</tbody>
</table>

*Table 3: Skills needed depending on the degree of innovation/ responsibility*
As we have seen in the first part, the degree of innovation is linked to the degree of responsibility of leaders. Then the more the leaders have responsibility, the more skills they need to manage the innovation. Technical skills are helped by non-technical skills in order to use them in the best way.

In a low degree of innovation and low degree of leaders’ responsibility, basic skills are the ones a leader in innovation will use. These basic skills will be highlighted by communication and relationship skills.

In a medium degree of innovation and medium degree of leader’s responsibility, basic knowledge is completed by knowledge in business management and organization. In order to use this knowledge in an optimal way, leader will add some managerial skills to their communication and relationship skills.

In a high degree of innovation and medium degree of leader’s responsibility, leaders will continue to use the same knowledge and skills they would use if they were managing a low or medium innovation, but they will add some strategic knowledge/skills that will be led thanks to problem/opportunity skills and vision skills.

2.2.3 Summary of the literature review:

Throughout this literature review, we have been able to distinguish three types of innovation depending on the degree of newness of the innovation. Then, we have seen what the process of innovation is and what the work of leaders is during all this process. We have observed that innovation is a very specific and complex environment where leaders need to demonstrate appropriate traits and skills in order to adapt themselves to the different situations they face.

After that, we have reviewed what the leadership traits theory is, how it has evolved through history, and what are the main findings about traits of leaders to finally focus on the current findings about traits of leaders in innovation.

The review of the leadership trait theory has led us to identify four main traits that appear to be crucial for a leader. These traits are cognitive abilities, confidence, sociability and determination. Then we have completed these traits with some traits related to the innovative context. This has allowed us to notice that traits and skills can be closely related. Indeed, we assume that traits can be a kind of personal base that enables leaders to develop skills.

Then, we have distinguished two types of skills. First, there are the technical skills, which are the knowledge that leaders get thanks to education, training or experience. They need to get at least basic knowledge about their area in every type of innovation. Then there are business and organizational skills that permit leaders to manage medium and high degree of innovation. Finally, strategic skills are required to lead highly innovative projects.
In order to use these skills when managing innovation, leaders will need non-technical skills such as relationship and communication skills for any types of innovation. Then, they need to integrate managerial skills to manage medium and highly innovative project, and to finish; they will need vision skills for taking strategic decision when working with high degree of innovation.

The different theories and models that we have chosen to treat through our literature review seem to us appropriate to support our research question. It would allow us to link the different traits and skills, that is to say the characteristics of leaders, in the innovative context.

2.2.4 Interview guideline

We will use this literature review as a tool to create an interview guideline to collect empirical data. We have chosen to place this “interview guideline” part in the literature review part, as the guideline is deducted directly from the literature review. That is why it appears to us more relevant to explain it just after the literature review. For more details about the guideline, the entire guideline can be finding in the appendix.

First, as we have highlighted in the literature review, the innovative context is quite complex and very demanding for leaders. That is why we need to ask questions about the environment context in which our future interviewees are working. It will be essential for us to know more about the companies where they are working in, what their job consist in, and how they are related to innovation process. This will permit us to collect data about the different types of innovation, and the process of innovation.

Second, we have chosen to continue with questions about skills. Indeed, even if we have assumed that personal traits can permit to develop skills, it seemed to us that it was easier to first ask questions about their skills, that are less personal, and easier to identify. We assume that personal traits are deeper inside people; as a consequence, it can be more difficult for our interviewees as well as for us to detect. We think that traits would be easier to identify after that skills have been found, so later in the interview. In order to find what technical skills our interviewees would have, it is crucial for us to ask question about their educational and work experience background. Then, to detect non-technical skills, we will need to ask questions to understand how they manage their work, the innovation process, what kind of relationship they have inside and outside the company, and how they deal with possible problems and conflicts.

Finally, as we have just said before, we will terminate the interview trying to identify the traits of our interviewees. For that, it seems necessary to ask questions about their feelings about their jobs, and also to ask them how they think that their personality impacts on their job. To do this, we will ask questions about what they think their strengths are and what weaknesses they would like to improve to perform their job. The aim of these questions would permit us to identify if the main traits of leaders and leaders in innovation that we have defined in the literature review can be detected, and if we can identify other traits. Moreover, the fact that traits involve deep characteristic inside leader’s personality, we will thanks to the knowledge we have get in the literature review, we will observe what the leaders will say and find out what trait they own.
3 Methodology

Through our study, we would like to observe what are the characteristics of leaders in innovation. This part will cover our view of the world, and the choices of methods to conduct our research.

3.1 Methodological assumptions

In order to answer our research question, we need to state what is our assumptions about reality, how to study it, and which methods we will use to collect data (Bryman and Bell, 2007 p. 16-22).

First of all, we need to define our methodological assumption about reality. It is our research philosophy, that is to say the way we think about the development of knowledge (Saunders, Lewis, Thornhill, 2003, p.83). It is important to define our methodological assumption as it inevitably impacts on the way we conduct our research (Saunders et al., 2003, p. 83).

There are two main methodological assumptions, the ontological and epistemological assumptions. We will define first what is our ontological assumption, that is to say the way we view reality. Inside the ontological assumptions, there are two main considerations that are objectivism and constructionism.

Bryman and Bell (2007, p. 23) define constructionism as “social phenomena and their meanings that are continually being accomplished by social actors. It implies that social phenomena and categories are not only produced through social interaction but they are in a constant state of revision”. This statement implies that people influence the social reality; they construct it. Indeed, Berger and Luckmann (1966, p. 13) argue that the reality is socially constructed, and analyse this process with the sociology of knowledge. Berger and Luckmann (1966) argue that through their interactions, people will form concepts and representations of each other’s actions, which will finally build the social reality.

On the contrary, objectivism is defined as “ the social phenomena and their meanings that have an existence that is independent of social actors” (Bryman and Bell, 2007, p. 22). This last assumption implies that human beings do not influence social reality.

In this study, as we observe the characteristics of leaders in innovation, we choose to use as ontological position constructionism. Indeed, we believe that social actors contribute to the construction of social reality. This means that through our research, we assume that the reality is built by the different people involved in our study, that is to say, the authors of the scientific articles, the interviewees, and the authors of this thesis. The interaction between these different people would permit to construct meaning about our research area and answer our research question. Therefore, when we will collect data through interviews, the constructionist position will be particularly adapted. Indeed, we believe that the interviewers and the interviewees are always actively
engaged in constructing meaning (Silverman, 2001, p. 87). When we will analyse our empirical data, we will assume that the findings about our research question are constructed through the interaction between the leaders that we will interview and ourselves. It will allow us to give our specific version of the social reality, which is not a definite version (Bryman and Bell, 2007, p. 23).

After defining our ontological assumption, we will now define our epistemological assumption.

Epistemological assumptions are related to the issue of defining what can be considered as an acceptable knowledge in a discipline. There are two main epistemological positions, positivism and interpretivism. Positivism advocates the application of the methods of the natural sciences to study reality (Bryman and Bell, 2007, p.16). Interpretivism is a “strategy that respects the differences between people and the objects of the natural sciences and therefore requires the social scientist to grasp the subjective meaning of social action” (Bryman and Bell, 2007, p. 19).

In our study we have chosen to use interpretivism because we wish to take into account the subjectivity of social science. Indeed, we consider that the subject matter of social science (that is to say people) is different from the subject matter of natural sciences, and implies subjectivity. This will lead us to interpret the reality. People are not rational subject matter, which implies subjectivity, and thus interpretivism. The world is too complex to theorise it with definite “laws” such as the physical science (Saunders et al., 2003, p. 84). Moreover, interpretivism reinforces our constructivist view of the world. Indeed, we argue that the interpretation of our data participates to the construction of our version of the reality.

The choices of our ontological and epistemological assumptions will lead us to the choice of our research approach.

### 3.2 Our qualitative approach

First of all, due to the topic of our thesis, we have chosen to use a qualitative approach to conduct our study.

Indeed, the topic and the aim of this thesis is to explore what are the characteristics of leaders in innovation, and we believe that we will understand them better using a qualitative approach. It is said that a qualitative approach emphasizes words rather than quantification in the collection and analysis of data (Bryman and Bell, 2007, p.28). Therefore, we believe that qualitative data would permit us to provide a richer description and explanation of our topic. Moreover, the choice of a qualitative approach is relevant with our ontological assumption, constructionism, and our epistemological position, interpretivism that we have explained in the previous part. Indeed, it is argued that qualitative researches mainly emphasize on the ways in which individuals interpret their social world, and they predominantly take a view of social reality as the construction of individual’s interactions (Bryman and Bell, 2011, p. 27).
This qualitative research approach is linked with our research strategy. A research strategy can be defined as the general plan of how we will answer the research question that we have set (Saunders et al., 2003, p. 90). In order to answer what the characteristics of leaders in innovation are, we have first reviewed what appear to us as the most relevant literature relating to this topic. This has helped us to well understand our topic, and gave us rich qualitative theoretical data. Thanks to the literature review, we have a better understanding of the innovation context, as well as a better knowledge of the traits and skills that can define a leader. It gives us a rich and deep explanation of our topic, as it is required by our qualitative approach. Moreover, as mentioned in the literature part, the literature review served us as a tool to build the interview guideline.

Then, our research strategy consists in comparing what we have found in the literature review with the data that we will collect through the interviews. So, the literature review serves us as a kind of baseline first to build the interview guideline, and then to compare and complete with the data that we will collect. This characterizes our link between theory and research.

This comparison would allow us to generate findings to answer our research question. We will for example compare the traits of leaders that we have defined in the literature with the traits that we will identify in the interviews in order to determine first if what we have said in the literature review can be confirmed. Second, this comparison can also allow us to find other traits that were not defined in the literature, which would be therefore new findings.

### 3.3 Research design

Considering the topic of our thesis, and the choice of a qualitative approach, we have decided to use a **qualitative interview design**. Indeed, interviews are linked to qualitative approach, namely due to the emphasis on words rather than on figures. The data from the interviews would not be quantified in our study. Moreover, we will add some observation when trying to find out the traits of leader. Indeed, finding leaders trait involve very deep knowledge about the leaders, in order to make findings about trait more relevant, it is important, in complement to what the interviewee will tell us, to observe by ourselves what traits can characterize them.

We assume that this design is relevant with our research about leaders’ characteristics in innovation. Indeed, it seems crucial for this research to have interactions with leaders in order to identify their traits and skills. The qualitative interview design would allow us to establish this interaction. Moreover, qualitative interview design would seek to describe and understand the meanings of central themes in the life world of the subjects (Kvale, 1996, p. 31). This means that the main aim when conducting an interview is to understand the meaning of what the interviewees say. So, when we will conduct the interviews, our aim will be to understand the meaning of what the interviewees say in order to answer our research question.

Interview is a tool that is often used in order to access people’s experiences and their inner perceptions, attitudes, and feelings. So it is relevant with our subject that aims to identify traits and skills. It is possible to divide interviews in three categories based on
the degree of structuring: structured interviews, semi-structured interviews, and unstructured interviews (Fontana and Frey, 2005, p. 699).

A structured interview is an interview that is composed by a certain number of predefined questions. With this type of interview, researchers conduct and must ask their predefined questions in the same order. This is a very standardized tool, which has for aim to minimize the flexibility effects of the respondent, but also to simplify the researcher data analysis. These structured interviews are similar to written surveys except that they are administered orally. Our research about characteristics of leaders in innovation needs us to go deeper in the discussion. So, we assume that structured interview would not let us enough flexibility to go further in the discussion, which would be necessary to highlight the personality of the interviewees and find out which characteristics they need to lead an innovative project (Zhang and Wildemut, 2009, p. 1).

Then, the unstructured interview technique was first developed in anthropological and sociological domains. Unstructured interview method is also called in literature informal conversational interview. Minichiello, Timewell, and Alexander (1990, p. 93), have defined unstructured interviews as interviews in which neither the question nor the answer categories are predetermined. This kind of interview relies on social interaction between the researcher and the informant and helps to understand a complex behaviour of respondents with letting freedom to the conversation. It lets also large interpretation to the researcher and asks high interpretation and psychological knowledge from the researcher. It would be interesting to use this method in order to go deeper in our interviewee’s mind and find out traits, but the context of innovation and leaders’ behaviour are very complex and depends on lots of variables. That is why it would be almost impossible to interpret correctly the answers of several leaders in innovation in order to find out which characteristics leaders in innovation own (Zhang and Wildemut, 2009, p. 1).

Semi-structured interviews are more flexible. In order to conduct the interview, the researcher needs an interview guide. The researcher usually predefines closed-ended and open-ended questions but during the interview, the researcher has a certain amount of possibility or niche to adjust the questions that would be asked and to add questions based on the context of the interviewees’ responses. (Zhang and Wildemut, 2009, p.1). In semi-structured interview, the researcher has a list of questions on fairly specific topics to be covered during the interview. Questions may not follow on exactly in the way outlined on the schedule (Bryman and Bell, 2007, p. 479).

In order to conduct our interviews about leaders’ characteristics in innovation, this semi-structured method would be the one that would be the most interesting. As we have said before, the fact to identify characteristics (traits and skills) in a complex environment obliged us to let to the respondents and us some freedom in order to adapt the interviews to what we need to find out. Then, our research has an objective, which is to identify what are the characteristics of leaders in innovation, and we need to conduct the interview towards this aim. If we unstructured our interviews, this will lead us to confusion and interpretation problems. That is why using semi-structured interview seems to be coherent. Indeed, it will let our interview enough flexibility to help us to find out the answers we need, and also enough structured to follow a logical guideline (appendix).
Finally, we need to mention that each interview was face-to-face interview and the length was between 45 to 75 minutes. We have chosen to record our interviews, in order to pay more attention to the interviewees rather than taking notes. By recording the interviews we believed that we would get a more truthful view of what was said during the interviews. We thereby decrease the risk of missing something said and therefore it appears to us more reliable.

### 3.4 Data collection method

As mentioned before, we have decided to conduct interviews of leaders in innovation. For reaching that population, we have chosen to a handpicked sampling method. Indeed, it was the more relevant way of reaching this specific population of leaders in innovation. We have complemented this handpicked sampling method with a snowball method thanks to recommendation of interviewee to advise us others who have the same study criteria (O'Leary, Z. 2004, p.110)

We have distinguished leaders in innovation as a leader who is involved in an innovation process. We would like to target leaders who are managers in different innovative companies, because managers are persons who have responsibilities and lead innovation process. We would wish to target especially project managers, division head or companies leaders. We would also want to get leaders in innovation that are evolving in different companies and industries in order to have a better quality of our work and avoid as much as we can industry context influence. We think that conducting 5 interviews of leaders would be sufficient to have enough empirical data. We identify this number as realistic as we have only short time to find managers in innovation in Umeå region, in Sweden. In order to find innovative companies, we will first make a brainstorming about innovative companies we could know in, and then we will look on the internet to find out other companies. We will also contact Uminova and the municipality business relationship department.

We will now explain you how we have manage to get our representative interviewees one by one.

As we have planned, we went to Uminova, which is an organization that helps companies in innovation, in order to ask them if they could help us to find contacts. Unfortunately, they were too busy with all the student demands and could not help us with findings managers. One person advises us to go to see a company located in Uminova Science Park that maybe could help us. We went there, but nobody was available for us. Uminova Science Park is a place where many companies are located, so we decided to go directly to those companies in order to ask them if some managers would accept to be interviewed. We met in a corridor a woman working for a company. She was ready to help us and introduced us to a manager who proposed us to have the interview directly. That is how we get our first interview.

After some other emails sent and unsuccessful phone tries, we found our second interview thanks to friends who were also writing a thesis and were in relationship with
an innovative company. They proposed us to ask if one leader working in innovation would be available, and one accepted to meet us in order to be interviewed.

Then, we have continued to send emails to companies, to the municipality business department and tried to call them without any results. So, we have decided to go again to Uminova Science park, where there are many companies working with innovation. We went there and as the first interview we met a person of an innovative company who accepted to be interviewed directly.

In order to find our fourth interview, we have again tried to call and send emails to companies but without success. As we did before successfully when going directly to Uminova Science Park, we decided to try our luck one more time. Luckily we met a person that introduced us to his boss and she accepted to take an appointment for being interviewed.

To finish, we tried to intensify our research without success, so we decided to ask previous leaders we have interviewed some helps to get contacts with other managers. They gave us some contacts that we called, but many of them were very busy and could not be interviewed in a short run. Hopefully, one of the contacts accepted to be interviewed quite soon.

Our mission was difficult, because we wanted managers who are often very busy people; moreover they needed to work with innovation, which limited the potential number of leaders we can find in Umeå. We wanted also leaders from different companies and industries. Luckily, we have found five different leaders in innovation who are part of five different industries. This has asked us lots of energy, but we managed to gather enough data to analyse them properly later in our research with a very high sampling and information quality.

3.5 Ethical considerations and limitations

Concerning the theory, the framework and the literature we have been very careful when choosing them to conduct our research. We have chosen these theories and secondary data thanks to research articles, manuals and books that we have gather mainly from Umea University’s databases, but also from other scientific articles in the internet. We have been very careful to choose articles and literature that fit our research and that have been published in relevant scientific journals.

For the interviews we have informed the interviewees before the interviews that they would be anonymous in our study. We will refer to them as leader 1, leader 2 and so on. We also inform the leaders about the concept of our study in order to avoid any lack of consent. Finally, in order to decrease the risk of invasion of the leaders’ privacy, the questions that we ask were as general as possible. These ethical considerations should be taken into account according to Bryman and Bell (2007, p. 133, 137 and 139-140).

Moreover, throughout this thesis, we have consistently avoided any types of plagiarism. The inputs that are not coming from us are clearly specified.
Then, we have noticed different limitations related to the qualitative approach, the interview, and the way we collect data.

Our qualitative research can present some limitations. First, it can be argued that our research is too subjective. Indeed, we interact with people, who are not rational subjects. Moreover, the fact that we will interpret what our interviewee will say to construct meanings also implies subjectivity. Then, the findings of our research could be difficult to replicate. Indeed, we will interview different people in a unique situation. It is not possible to do again exactly the same research, and to collect the same types of data. There would be necessarily different. Moreover, our interpretation of these data would be different from the interpretation of other researchers.

Another limitation relies on the fact that we have only a rather short time to conduct this research. It could have been deeper by conducting more interviews, which could have permitted to confirm our findings.

Also, identifying personal traits or skills are not so easy during interviews. Indeed, we cannot ask directly to people if they think that they are clever, for example. These kind of questions are not easy for people to answer, and can invade leader’s privacy. For gathering data about traits, we will observe what leaders tell us during the interviews and try to gather enough information to identify traits. These observations of what they will say will lead us to discover what their traits are. We have read many things about traits that can help us to identify them quite easily. Moreover, we are only master student and our capacity of observing traits directly during the interview will ask us lots of concentration.

Finally, the fact that the interviews were conducted in a language that is not the mother tongue of both parties might reduce the level of details and understandings.
4 Empirical Observation

After interviewing several managers from several companies and industries, we will present now what happened and what we have observed during those meetings in this 4th chapter.

Our interviews were conducted with a sample of five different leaders working in innovation; they are all from different companies. These companies are part of four different industries and they are all located in Umeå, Sweden. Each interview is independent to each other. Even if the topic discussed during those interviews was close to each other, it is more relevant for our study to present them separately and then in the analysis part to combine them.

For each interview observation, we have decided to use the following structure. We start to present in what type of company leaders are working in. Then, we explain leaders’ jobs and their link with innovation. After explaining this context, we then focus on the educational background and professional experiences of the leaders. We will also present which skills they need in order to perform their job, focusing on their managerial, communication and relationship skills. We will finish by presenting data about leaders’ feelings, which strengths and weaknesses they need or would like to improve to do their work better.

4.1 Interview n°1

4.1.1 Company and innovation context

The company

The company is a bio-pharmaceutical company that has been founded seven years ago. At that time ten people composed the company. There were five PhD graduated people who have different knowledge about theoretical chemistry. They have developed one product that is used for separation of molecules. “If you want to know one component inside a drug or inside the food, our product is for that” leader 1 explained to us. After a while, this product became one of the best in the world. In Umeå, they still try to improve their n°1 product and do research in other ones. Two new products will go on the market soon.

The company was independent since 2008. Then, one of the biggest pharmaceutical companies in the world, which has noticed the big potential of this start up, bought it. The change of the organizational structure is interesting for us in order to highlight the leader 1’s personality and his adaption to the change. This change in organization gives him two different experiences from start up to multi-national companies. The company that owns this start up does also research in pharmaceutical technology and works in more than 65 countries. It is worldwide and the headquarter is in Germany.
**Leader’s job**

Leader 1 is a project manager and has a team of two people, one PhD researcher and one engineer. In this area, projects are based on research so they need to work hard with researchers and engineers. The human resources are limited, but leader 1 does not mind to go to the lab and does practical things that normally are done only by the engineer. In parallel, leader 1 is working on two other projects where he is just a member of a team. He told us that the degree of involvement and time spending on these three projects is different, because when it is his own project, he is more committed, spend more time and is more focus on it.

**Leader’s link to innovation process**

Leader 1 explains to us how they bring ideas in the organization since the acquisition. It is a kind of contest between employees that bring ideas. Then, a committee selects some of them. Last year, the interviewee has submitted one idea. This was not successful because of the huge amount of money it requires. However, leader 1 recognizes that he is quite glad to have taken the opportunity to try.

Leader 1 mentions that when you work in innovation, small structures can be more adapted to the innovation thanks to their flexibility. Indeed, before the acquisition, he had just to ask and discuss with the CEO an idea, to see if it can be developed. Today, with the acquisition, leader 1 declares: “Now if you have an idea, you need to report to Germany, and most of the time they said no because it always costs too much”. Before the acceptance of the project, the headquarter needs to check financial profitability and also market potential, this takes time.

### 4.1.2 Leader’s skills and traits

**Experience and educational background**

Leader 1 owns a PhD in chemistry field. He is originally from China and has worked in Canada for many years in different industries. He worked as a technician, then as head of department, and after that he decided to move to Sweden in order to have more education. After his studies, he came directly on this start up and worked as manager.

In the new company, they have some education program to start to manage and one obligatory course that is named “managing in name of the company”. He has planned to take it in October. Even if he has already worked more than 3 years for this company and knows quite a lot, he thinks that the idea is good in order to know the company culture and get more knowledge how to manage people. He explained to us the program of this course and seemed very interested and already got lots of information about it. When we asked him if he would feel ready to be a manager in a different kind of company, he was ready, thinking that the principle is the same, and of course he will need to get more knowledge in this specific area.

Thanks to his experience of a small company before the acquisition, leader 1 has seen every part of the company. He knows how to work hard, to find investors, clients, and
appreciates when the company gets money. With the acquisition by the big company, leader 1 declares that unfortunately he can only see now just one part of a big system. Yet, he really enjoys working for a bigger company, because he can compare with his previous experience and get benefits from it. There are advantages and disadvantages, but mostly he can work in better conditions and concentrate more in what he likes the most: research.

Moreover, after the acquisition, employees have fewer worries about money and investment, but they had worries that Umeå unit would be relocated. Hopefully it was not, and that obliged them to do each time a very good job in order not to take the risk to be relocated. “With our knowledge and our experience the company realized that we are very able persons. You think first that a big company has more skilled people, but we realized that we had a good impact on the big company teams and appreciate our work.”

**Managerial skills, communication and relationship skills**

When talking about leadership and managing a project or a team, leader 1 explained to us that he has learnt by doing most of his administrative and non-technical part of the job. He explained to us how he worked and how he learnt this business part: “At the beginning of the company, we needed to learn what it is to work in a research start up, but we were lucky that our CEO and investors knew how to manage, because they had other business beside. Even with very good bosses that have lots of knowledge in management, we noticed quickly that we need to learn more. Because when we go to scientific exhibition, we have to talk to people, to customer. Maybe this time it was not perfect, but next time we will improve by some ways. Quite often we have to go out and do this kind of outside seminar, go to the customer.”

He described the working atmosphere in project teams as a “very smooth connection between us”. They have daily discussion between each other. Now they are also working with the German headquarter on project. He has contact with these team members every week and meets them in person several times a year. He will go to meet them again during this month. He explained to us that even if they are not working in the same locations they still have a “dynamic interaction”. In his project, there are people for many departments, from production, from marketing, from quality, also from intellectual property. He added: “In Umeå, we are seven people working and we are lucky to have very good relations and communication between all these team members”.

**Leader’s feelings about his job**

Since the acquisition of the company, our interviewee thinks that the biggest change is that now they are part of a big system that has big resources “You can do things quick and you don’t need to think about money”. Before the acquisition, leader 1 explains to us that the employees of the company wondered at the end of the month if they will get their salary and worry where to find money. “Before we always get pressure. When we received a fax for an order from customers, we were very happy and sent directly the product to them. This uncertainty was not that good but it makes life very active, sometime you feel stressful, and sometime you feel very alive”. He thinks that now, as they have less connection with sales and marketing, it is a little bit frustrated not to see
the final result of the process. But of course in big companies you have more advantages such as good salaries, better welfare. Also, the finance part of the project is very well planned.

Moreover, since the acquisition, starting projects is more complicated, and, as mentioned before, they face more refusals. Leader 1 thinks that it is sometimes difficult when he has a new idea and when he believes in it to find a way to convince people who are far away. “If we take our main product, it would have been killed at the beginning of the process”.

Leader’s strengths and weaknesses

During the conversation, leader 1 mentioned many times that his aim is always to improve himself in everything, and especially when talking about management and leadership. Indeed, he never had real education about management and business, and he learnt all of this by himself. He had the will to improve even if he had to become a student again, and to start an educational process again.

Traits observation of leader 1

The interview made with leader 1 has allowed us to observe some traits that characterize him. First, leader 1 demonstrates cognitive abilities. Even if of course he has not declared clearly that he was intelligent enough to perform his job, we have observed that he owns, thanks to his educational background, and his past experience, the cognitive abilities necessary to perform his job. That means, the intelligence he gets has help him to pursue his studies in a high level. Moreover the fact that he is able to gather knowledge and have highly technical things proves the help of cognitive abilities when gathering information.

Then, we also observe that leader 1 is sociable. Indeed, it was really easy to speak with him during the interview, and moreover, he also declared that he likes to work in a smooth atmosphere, where there was an easy communication between people.

We also observe that leader 1 was confident. Indeed, we identified this trait especially from the fact that he has to propose new projects to his company and declared to us that he has the capacity to believe in those projects.

We also observe that Leader 1 is determinate. We have identified this trait when leader 1 told us that when he faced a problem in a project he tries to improve it in order to be approved by top management.

Leader 1 also owns a real desire to improve himself. He is indeed really interested in developing managerial skills, for example.

Another trait that we have observed is the fact that leader 1 declares to be a hard-worker.

We also identify as trait the fact that leader 1 is enterprising. We observe this trait as he dares to start new project, when he proposes new projects to his company.
Finally, we have also observed that leader 1 is adaptable as he was able to adapt from a small company to a bigger one. This change of structure implies different requirements.

### 4.2 Interview n°2

#### 4.2.1 Company and innovation context

**The company**

Leader 2 is working in a forestry machines company which is ranked as the second largest manufacturing forestry machine company in the world. The company produces between 700 and 900 machines a year. Around 400 employees are working at Umeå plant. Umeå plant is owned by a Japanese company where about 40 000 employees work worldwide in different industries as construction, mining or military equipment. The manufacturing forestry machine part owns different sales branches around the world, such as in South America, North America, Europe, Indonesia, and so on. The company tries to be implemented in every area where a need for forestry machines exists. The plant in Umeå did not pertain to the big Japanese company since the beginning, but has been bought in 2003. Before that, the plant first pertain to a Finish company, and then to an elevator group. The headquarter of the forestry machine company is located in Umeå. They are mainly responsible for product development and are independent from their mother company.

**Leader’s job**

Leader 2 works as a project manager and planner. His main job is to plan on the short and long term product development. Shorter projects last about one year, whereas other projects can last until 5 years. In order to offer products adapted to the market, leader 2 needs to get knowledge from the market and forecast what will be the future demand of the market. To do that, the product-planning manager is linked to the marketing department. He is working with sales department that have a direct contact with customers. They collect information such as what type of product improvements need to be done, and make new product proposal. Moreover, internally, engineers participate to the emergence of new ideas and product improvement. Ideas also emerge from strategic meetings, where R&D people, project managers and top management are involved.

**Leader’s link to innovation process**

Leader 2 explains to us how he works with the innovation process. If leader 2 decides to develop a totally new product, he needs to start a pre-study. His job is to present it to the team composed by marketing, R&D, and production people. When the innovative project looks promising, the pre-study is presented to the top management meeting. Then he tries to convince them to start it. He needs to present good-looking project with high profitability potential. Leader 2 also mentions that low degree of innovation projects do not require this pre-study and the approval of top management.

However, for a project that requires a pre-study, if top management approves it, the main role of leader 2 is to prepare the launch of the product development, and to follow the proper implementation of the product. He studies in collaboration with the
marketing department how to reach the market, and works on issues such as pricing with financial department. Between the idea generation, and the realization of the entire project, it takes usually between 18 and 36 months, depending on the scope of the project. For example, if they can take components to existing machines, it is faster, if they need to start from the beginning an entirely new product, it is much longer.

In order to manage an innovative project, he is working with a team. Leader 2 can be responsible for the team, when he leads a project, but also just part of the team in other projects. Different human resources are available in the team in order to build the product in the right way. For example, one person is responsible for the pricing, another one for the analysis of the market. So leader 2 has different resources in his team, but they are not organized under him, but they work as a team

4.2.2 Leader’s skills and traits

Experience and educational background

Leader 2 is graduated as a forest engineer. However he has never worked as a forestry engineer. He has always been working with the sales around forestry machines. He has worked also as an agriculture tractor salesman. Then he has worked for an industrial producer of drills and construction machines. Even if he has not used so much his engineering background, leader 2 believes that his engineering background is quite useful. Indeed, he works a lot with engineers in the company and it helps him to understand quickly technical issues. Moreover, his sales background helps him to combine the needs of the customers with the technical issues. However, even if he owns an engineering background, he does not believe that it is indispensable for his job. On the contrary, he assumes that what is important is to have a good combination in the product development team. Indeed, he states that it is wise to have some people with forestry knowledge, technical knowledge, as well as people with good business knowledge. It is important to have all types of skills in a group not to miss certain important points in the project. For example, leader 2 believes that a team composed only by engineers might be too focus on the technical part of the project, without paying enough attention to the business side. It might lead us to develop product that do not answer the demand. As a project manager and planner, leader 2 thinks that unfortunately he has not beneficiated from training program to learn how to plan and manage a project. He has learnt by doing.

Managerial skills, communication and relationship skills

Leader 2 explained to us that when he has a problem with one of his product, he goes directly to the customer to understand what the problem is and try to find out the solution with the R&D department. With getting close to the customer, he can react quickly and solve problems easier. He also meets some failure when proposing some innovative projects to top management team, and most of the time he works hard to make changes into the report, and presents it again to the board.

Leader 2 needs to work closely with sales, R&D and marketing department during the innovation process. So, they meet often and work in a good atmosphere where everyone knows what they have to do, and what others are doing. Moreover, the communication
inside the team is facilitated by the fact that all the people of Umeå work side by side. As a consequence, it is easier to communicate, to reach people if you have some problems.

**Leader’s feelings about his job**

Leader 2 told us first that he really enjoys his job. Indeed, he has always been passionate by the forestry technology and machines. He was driven these machines before studying at the university and though that he has always wanted to work in this area. Then, he likes also his job due to the fact that he could have an entire view of the life cycle of the product. From the demand analysis of the market until the launch of the product that answers these needs. For him, the most interesting part is the analysis of the market and he feels closer to the marketing part of the company.

**Leader’s strengths and weaknesses**

Leader 2 declared to us that when he really believes in a project, he tries to do his best in order to make this product comes to life. Even if the project might be rejected once, if he really believes in it, he will try to improve the pre-study, to make the project accepted.

Finally, leader 2 knows that his ability to understand the product he is working with very well, gives him a real strength towards other managers. However, he would like to improve his marketing and financial skills, in order to offer products that could answer the demand, and at the same time being profitable. Moreover, he is working with people from different functions and it would be easier for him to understand better what they are doing. It would help him also to construct better reports and get his own ideas and project accepted easier.

**Traits observation of leader 2**

We have observed different traits of leader 2 through this interview. First, leader 2 owns the necessary abilities to perform his job. He has engineering educational background, and past experience. The fact that he was capable to follow courses and have high technical knowledge comes from the fact he have cognitive abilities.

Then, we observe that leader 2 is someone confident. He has to propose new product improvements, or new project to the top management of his company. He is confident enough to do it, and declares that this confidence namely comes from the fact that as he is also a user of the forestry machines, he understands well the needs of the customer.

We also observe that leader 2 is sociable. We observe this trait as he told us that it was easy to communicate inside the company. Moreover, it was easy for us to speak with leader 2 during the interview. He makes us feel comfortable.

Determination is another trait of leader 2 that we have identified, when he told us that in case of failure of a project proposal, he tries to continue to work on it until it is accepted.
Leader 2 also owns a real desire to improve himself, when he states that he would like to improve his marketing and financial skills.

Finally, we observed that leader 2 is someone enterprising that has the capacity to dare to propose new projects.

### 4.3 Interview n°3

#### 4.3.1 Company and innovation context

**The company**

It is a software company that manufactures simulators for all kinds of vehicles. It is a quite small company, employing around 45 persons. “We are able to simulate everything”, leader 3 explained. The main purpose of this company is to produce simulators in order to train operators for heavy vehicles, such as excavators, harbor cranes, wheel loaders, forestry harvesters, surface-drilling rigs etc. This company is able to test, to simulate things that have not been manufactured yet. They are working closely with partners and R&D.

**Leader’s job**

Leader 3 is working as project manager, and works close to the company’s partners / customers. Leader 3 works in a project with three persons who are all engineers. His job is to budget and give a certain amount of time to his team to work on a project. Currently, leader 3 is working on a project and told us: “We are half way of the project. Finance and marketing follow us during the all project. I even start to give pieces of information to our customers, and in 3 to 6 months, when the project will be over, I will go to propose our product to them.”

He works closely with big vehicles manufacturers and observes that concerning innovation, big companies have difficulties to manage changes. When working with innovation, companies and leaders need to dare and take risks. In small companies, leaders are more able to take responsibilities and they have fewer barriers to do it.

**Leader’s link to innovation process**

Innovative products are created thanks to the ideas and information coming from both customers and/or internal R&D. When the idea comes from the customer, they expect the company to make what they told them to do. If the company wants to innovate by themselves, they create a project team for it. Depending on the project, they sometime need to develop it together with one partner. When they are able to do it by themselves, they develop it internally. When working with innovation, our interviewee explains to us that you need to adapt quickly, and to be open.

Moreover, thanks to their close relationship with their customers/partners during the whole process, the company can send to them different versions of a product for a test, and then continue to improve it after customer feedback.
4.3.2 Leader’s skills and traits

Experience and educational background

Leader 3 has been working with startup companies for 15 years in two different branches: fiber optics and in vehicles simulators.

Concerning his educational backgrounds, he has studied a little bit engineering without going until the graduation. Then he has worked in a car manufacturer company for 10 years as technician/engineer. Later, he tried to go back to studies at the university but did not finish his degree. He studied engineers, leadership, product management and psychology, which gave him some knowledge in “everything and nothing”. He is working with sales, marketing and project management now but has never really studied it.

Managerial, communication and relationship skills

When he has a new project running and a new product coming out, leader 3 invites people involved or who will be involved in it. He sends to them an email with all the information needed for the meeting some days before, in order to get feedback during the meeting. They discuss about the targeting market, the development process, or customer expectation. If they meet some problems, they try to solve them. If a customer highlights a problem, they also discuss it during this meeting and try to find it out. If necessary, he builds a new team to fix it. They work with R&D, and try to get money from top management. Then, the new project can start. “After making project team with different functions, I give them time and set goals and task. Then I give them a time line and at each project gates we give report to management team”.

Leader 3 mentioned one particular thing that owns Scandinavian companies when he compares to US, German or French companies. When a decision has to be taken in Scandinavia, everyone in the team, from team’s member to team’s leaders is at equal level and has the right to give his opinion. According to him, it allows the project to go quicker when involving everyone in the decision-making. “This kind of leadership has always two sides: in innovation company, it is a crucial thing to work with everyone’s involved in the decision because we need to be quick and flexible. But when you come in bigger organization, it is maybe not a very good idea to have everyone able to say everything about everything. It can take too long time, especially when you have a manager who does not dare to take decision. That is the bad side of it.”

Leader’s feelings about his job

Leader 3 clearly told us that his job is very interesting and he likes it a lot. He really appreciates as a project leader to be able to “do a little bit of everything”. He has backgrounds in engineering, sales and he likes to have a broad view of the entire project. He explains to us also that the difficult part of his job is the traveling part. He is travelling almost a quarter of the year, even on weekend. He would prefer to have someone to help him. This could allow him to concentrate more on his work and to have a better balance between his work and personal life.
Leader 3 would also like to have a more stable team that does not change at each project in order to get closer with partners and to keep the knowledge and experience from one project to another.

**Leader’s strengths and weaknesses**

Leader 3 thinks that it is important to improve himself, and would really like to improve the financial part of his job. He has looked at a part time program at Umeå University and will certainly do it next spring, because there is no program earlier. As he is working closely with partners, he has noticed that people usually get confident to him and that, when he travels and meets partners from any countries, he gets friends easily. It is his main aim when meeting partners. He needs to have good and long-term relationship with his partners and wants to be as close as possible with people he is working with. One other point of his personality he talked about is the honesty towards people he is working with.

**Traits observation of leader 3**

The interview conducted with leader 3 has enabled us to observe some of his leader’s traits. First of all, we observed that leader 3 possesses the necessary capacities to perform his job, thanks to his educational background and past experience. Leader 3 has managed to follow different courses in different area that has asked him cognitive abilities. Moreover everything he has learnt before at university or in previous job, help him today in his job. He could gather all this knowledge thanks to a high cognitive ability.

Then, we also observe that leader 3 is someone really sociable. We identified this trait especially when leader 3 told us that he tries to get friends with the customers he meets.

Then, we observe that leader 3 is someone confident, more specifically he releases confidence. Indeed, he told us that he was really honest towards his customers, which enables him to release confidence.

Leader 3 also owns a real desire to improve himself, when he states that he would like to improve his financial skills.

Finally, we observed that leader 3 is a hard-worker when he explained to us that he traveled a lot for his job, including weekends.

### 4.4 Interview n°4

#### 4.4.1 Company and innovation context

**The company**

The company leader 4 is working in is a consulting company that works with the development of IT system. They are developing appropriate IT system according to the needs of their customers. They have many different types of customers mainly in Umeå, in other cities in Sweden, and also some in other countries. About twenty employees are
working in this company. Many of them are engineers and there are three top managers. Moreover, this company is quite young and started two years and a half ago.

**Leader’s job**

Leader 4 works as top manager in the company, and works with consultants on innovative projects. However, as the company is still quite small, she does not take care only on the management issues, but needs to work with everything, such as sales, planning, strategic decision, accounting, and so on. Currently, she works less as a consultant for customers, but works more with management leading questions. She works on issues such as the creation of business plan, as well as many administrative issues that need to be solved inside the company. For example, as the company is growing, they need a better work-hour system, as well as a new salary system, and also need bigger facilities.

**Leader’s link to innovation process**

Leader 4 has a key position in this company. The company is involved in the innovation process but mainly externally. She is responsible of human resources management in the company, which obliges her to deal with managers working in innovation. Moreover, she needs to deal with several innovation projects the company is working on. As top manager, she needs to lead all projects from the top and she also works sometime as a consultant in IT innovative project when the company needs it.

### 4.4.2 Leader’s skills and traits

**Experience and educational background**

Leader 4 has studied new system information class at the university. It is not an engineer program, but it deals with the different new system of information. After that, she has worked in different companies, small ones, or bigger ones. She has although worked with developer system as project leader. Leader 4 has received some training program about leadership in one of the big company she was working for. She has followed a leadership education program during a half year. Moreover she declares that she has learnt a lot by doing, by working. She thinks that the combination of educational background, past experience, training program and current experience is important. It permits to have a mix between theoretical knowledge and practical issues. Also, she has read a book about driving people. She believes that it is important to read about theoretical research, and combine it with what happens in the real life. Leader 4 thinks that her past experience as well as her educational background can help her in her current job. It can help her not to do the same mistakes that she has done before.

**Managerial skills, communication and relationship skills**

Leader 4 explained to us that, thanks to her past experience, she could sometimes view problems before they happen. But, sometimes in company, you do not have enough time to well anticipate potential problem. Moreover, some unexpected problems that were not possible to anticipate can also arise. When she has to face a problem, her reaction is quite optimistic. “Every problem can be solved”, leader 4 declares. In order
to resolve them, she believes that communication is important. You need to talk to the people concerned by the problem, and try to look at different views to solve it.

Moreover, she thinks that it is really important when you work in an innovative context to be clear about what you do, your goals, and your objectives. It is crucial that people inside the company, as well as the customers, are informed about what everyone is doing; what are the products that the company offers, why they offer it, how they work towards the goals that are fixed and so on.

Concerning the decisions inside the company, she told us that they benefit from an open atmosphere, where every employee can give their opinion. According to the kind of decisions, people are more or less involved. But the main idea is that when a decision will impact on certain employees, they will take part of the decision making process.

**Leader’s feelings about her job**

Leader 4 told us that she really likes her job. Even if it is very demanding, the fact that she is working with many tasks, need to lead teams and draw the company direction is very exciting. She also likes a lot to start project, and declares that “it important to do things, to dare to embark in a project”. She believes that especially in a small company, you need to have the capacity to start projects by your own.

**Leader’s strengths and weaknesses**

Leader 4 works as a leader, and needs to interact a lot with others, and take decision. She thinks that her ability to work hard and exchange with others help her a lot to do her work well.

She told us that there are always some points that you need to improve when you are evolving in a company, and especially when working with innovation. She was indeed particularly interested in developing her ability to drive and motivate people, and try to get knowledge about that thanks to readings. She is also able to establish goals. Moreover, she is quite an optimistic person, and tries to implement project to improve the way the company is working. Even if she makes some mistakes, she tries to learn from them to keep doing things better.

**Traits observation of leader 4**

The first trait that we have observed in leader 4 is her cognitive abilities. Indeed, as top manager, leader 4 is a person that has a strong work experience as well as the educational background that allow her to perform her job well. The fact that she was capable to gather lots of information and learn many technical education, and also learn by herself management, show us that she have high cognitive abilities.

Then, we observe that leader 4 is really sociable. First, because it was really easy to communicate with her during the interview, and second because she believes that it is really important to have a good communication inside and outside the company. She told us that it was important to speak with people in order to make everything clear.
We also observe that leader 4 is someone confident who dares to embark in project. Indeed, she clearly told us that “it is important to do things in a company, to embark in some projects”. So we observe that she was enterprising, she dares to start new project.

Another observation is the fact that leader 4 possess the desire to improve herself. More especially, she told us that she would like to improve the way she can drive and motivate people.

Finally, a trait that we have identified in leader 4 is also the fact that she is adaptable. Indeed, she works in a small company that requires her to work on lots of different tasks.

### 4.5 Interview n° 5

#### 4.5.1 Company and innovation context

**The company**

The company where leader 5 is working deals with molecular biology, more specifically with developing new types of drugs. It is a really innovative company that has been founded by researchers, in 2000, and became public organization in 2004. There are between 8 and 10 people working in this company. They get their finance from the Swedish government, from European and international funds. All these financial aids permit to push scientists to have a business view and experiment new innovation that will answer a potential need on the market.

**Leader’s job**

Leader 5 is the head of the scientist department inside this company. She is working with a team on several research and projects, and is also involved in the general management of the company. In parallel, she also works as project manager for two projects, and together with the CEO, she has to write some reports, or press releases to present company’s work. She was also responsible for giving track of what is happening in the scientist world and goes to conference, meetings and so on. This implies that she is in relationship with people outside the company, customers, and people from the university. As part of her job, she had to deal with different projects at the same time, and she wished she would have more time to have more contact with people developing the products. She has to delegate some parts of her job.

**Leader’s link to innovation process**

The process to develop a drug consists first in creating a test system, to check a hundred thousand of chemical components to see which one of them could be a good starting point. It leads to screen different components in order to see which one could be used. Actually, the head of laboratory works with leader 5’s team in order to propose ideas. The head of laboratory presents potential ideas during meetings with the management group that then decide which projects are worthwhile to be started. Leader 5, as the head of science department, the CEO and the head of the laboratory compose the decision team. The development of a drug is a long process that can last about 15 years.
4.5.2 Leader’s skills and traits

Experience and educational background

Leader 5 owns a PhD in molecular biology, and has worked as a post doctor for few years, before working as head of science inside the company. She does not have any business background, but has taken some courses about leadership when she started to work in the company. She thinks that it was a bit difficult to become a project manager without any business background, but managed to learn things especially by doing. Even if she has taken some courses, she believes that she has learnt more by doing. But she thinks that it would have been nice to have these competences before she starts working. Moreover, she told us that she has learnt a lot from the first CEO of the company, who was a person of experience.

Managerial skills, communication and relationship skills

Leader 5 found that in order to become a project manager, she has learnt to be more interested and interact more with people. She had to learnt how to make people do what she wanted them to do. She also needed to learn how to handle with conflicts and so on. She believes that a good interaction between people is essential in an innovative company where you create idea. Indeed, everyone must be able to give his idea, and also to be able to say that an idea is good or not. This is easier when there is a good interaction between people. So, she has worked on how to be able to create a good atmosphere at work.

Moreover, she also needed to develop her business skills to know how to run a company. She added that when you work in a small company you need to learn everything. She thinks that it would have been good to have some class to learn the basics of business, in order to learn for example how to develop a business plan.

Concerning the relationship inside the company, the company used to have formal and informal meetings. Due to the small size of the company, it was easy for people to meet everyday. Moreover, they used to have once a week a coffee meeting, an informal meeting where they can discuss business issue, or other topics that contribute to the good atmosphere inside the company.

They have also settled a more official scientific meeting each month. It deals with literature meeting; everybody in the company and some university people that could be invited present a scientific paper. This allows them to keep aware of what happen in the research world, which is especially important when you work in innovation. Indeed, when you work, you can have a tendency not to continuously keep your knowledge updated because you are focus on your work.

Leader 5 also believes that to become a good leader in her field, it is essential to have a scientific background. Otherwise she could not manage these projects particularly complex. She thinks that it is important in this type of industry, especially when you do the project timetable. Indeed, you need to know how long it takes to do something, if
the project is feasible or not. It also allows her to understand the difficulties that must be faced by the scientists.

**Leader's feelings about her job**

When learning how to become a project manager, leader 5 has particularly liked to learn how to work with people. She thinks it was interesting to deal with different personalities.

Moreover, leader 5 has noticed an important issue when scientists are working with innovative product or research. They stay too focus on their innovative ideas that they believe to be good, without paying sufficient attention to the needs of their customers. They can have a tendency to think that their good ideas will sell by themselves. So, she believes that it is important to combine different competences in this kind of business, namely the scientific and business competences. She needs to convince scientists that they also work in a business context.

When a project is rejected, it is sometimes difficult for her to let it go, especially when she really believes in it. However, she specified that sometimes you cannot struggle to continue it, namely when it is a matter of patent. When you cannot have a patent, it is not worthwhile to continue.

**Leader's strengths and weaknesses**

There are some points that leader 5 would like to improve as project manager. This concerns particularly her business skills. First, she would like to improve the way she budgets a project, and the way she makes financial report. She would like also to have time to discover what different tools you can use in project management, such as new software, some theories… She has learnt to use some of them, but she would like to have more time to use other ones.

Then, one of her strengths as leader comes from the fact that she likes people. She is a good listener and told us that communication is not only about talking but also about listening.

Leader 5 is quitting her job as head of science to become a consultant, and runs her own company. The reasons that pushed her to start this new project come from the fact that she had worked as head of science during 7 years, and has the desire to change. She is pretty exciting to start her own company, and wishes to have more interactions with scientists and be able to work in different projects.

**Traits observation of leader 5**

The first trait that we have observed in leader 5 is her cognitive abilities. Indeed, she works as head of department, and owns a PhD. In order to manage to get a PhD, she needed to get high cognitive abilities in order to gather lots of information and use them in her work. Moreover, she is still learning a lot by herself about management and leadership. That shows her ability to gather knowledge and show her high cognitive ability.
Then, we observed that leader 5 is someone really sociable, who told us that she likes to work with people.

We also observe that leader 5 is someone determinate and confident. Indeed, she told us that she has the capacity to believe in the projects she proposes, and tries to improve them in case of rejection in order to be accepted.

Another trait that we observed is the fact that leader 5 is adaptable. Indeed, the company where she works is quite small, which requires her to perform different tasks.
5 Analysis

The chapter 5 presents and analyzes the relevant empirical data from the interviews. The results are analyzed according to the comparison with what we have learnt from the literature review.

5.1 Basic interview information

In order to facilitate our analysis, we have decided to build the following table with the basic information from the interviews.

| Length of interview | Industry             | Company size       | Innovation level | Position           | Gender
|---------------------|----------------------|--------------------|------------------|-------------------|--------
| Leader 1            | 75 min               | Pharmaceutical     | Small → Big (acquisition) | Medium/ High      | Project Manager | Male   
| Leader 2            | 70 min               | Forestry machinery | Medium/Big       | Low/ Medium       | Project manager | Male   
| Leader 3            | 50 min               | Simulators machinery | Small/Medium   | Medium / high    | Project manager | Male   
| Leader 4            | 45 min               | IT                 | Small            | Medium            | Top manager     | Female 
| Leader 5            | 55 min               | Pharmaceutical     | Small            | High              | Head of department | Female |

Table 4: Basic interview information

This table summarizes the main information about the interviews. Every column relates to facts, except the column named “Innovation level”, which has required an analysis from our part.

Indeed, we assume that the first company we interviewed owns a medium / high level of innovation as it offers very specialized products in the pharmaceutical industry. First, they make improvements of their existing products, namely the product used to separate molecules. So, we assume that this is a medium level of innovation. Second, the company is also developing two totally new products, which relates, according to us to a high degree of innovation.

Then, we assume that the second company deals with low and medium degree of innovation. Indeed, the main part of the innovative work of this company is to make improvements on their forestry machines. According to the level of improvements, we state that the level of innovation is either low or medium.

It appears to us that the third company owns a medium / high level of innovation. Indeed, the simulators are very high technology product. So, when the company has to develop such a product, we assume that it is a high level of innovation. At the same
time, the company also sometime only improves its existing product. So, we can assume that they can also work with a medium degree of innovation.

The fourth company from the IT industry would deal with, according to us, a medium level of innovation. Indeed, they offer IT system to their customers, which requires an adaption of this IT system to the needs of their customers. So, we assume that it deals with a medium level of innovation, as it is neither an incremental nor a radical innovation.

Finally, we assume that the fifth company that develops drugs deals with a high level of innovation. Indeed, each drug developed is a new product that requires high knowledge in the chemical field.

5.2 Context Analysis

In our literature review, we have seen that innovation is a very complex and demanding working area for leaders. Indeed, we have first identified that different types of innovations would change the way of working of leaders, as it impacts on their degree of responsibility and therefore their characteristics. Then, we have observed that the innovation process also requires leaders to use different characteristics.

After conducting several interviews, we have tried to identify how the types of innovation and the innovation impacts on the work of leaders by comparing our observations with what we assumed in the literature review.

Moreover, thanks to the interviews, we have discovered a new finding: the structure of the organization would have an impact on the types of innovation, and the innovation process and then on the leader’s work and characteristics. This finding impacts on our context analysis. That is why, in order to make this point clearer, we will start the context analysis by giving more explanation on this finding.

5.2.1 Impact of company’s structure on the types of innovation and the innovation process

Through the interviews that we have conducted, we have observed that the way of working on innovation can be different according to the size of the company. Indeed, we assume that there is a difference between working in a small company or a big one. This difference seems to impact on the types of innovation and the innovation process, and then on the work of the leader. We have noticed this fact during our first interview with leader 1 who has worked in the same unit but in two different types of structure; one start up that has been acquired by a multi-national company. He has explained to us the difference between these two organizations and it reveals that his role as a leader has changed. Indeed, it seems that working for a big company or a small company can imply different challenges and goals. In small companies, it can be assumed that a leader will highlight some qualities that do not appear in big companies.
That is why we need to add to our literature the fact that not only the degrees of innovation and the innovation process impact on the work of the leaders but also the types of company they are working in. We have not noticed this fact in the literature review. Yet, this finding appears to be very important in order to analyze properly the different degrees of innovation and the innovation process.

5.2.2 Types of innovation

As mentioned in the previous part, we assume that the size of the company would first have an impact on the types of innovation, and also on the types of responsibility, and then on leaders’ characteristics.

First, we assume that leaders who work in small companies such as leaders 3, 4 or 5, would be able to work on any degrees of innovation they want. Indeed, it seems that leaders from small companies can work on high degree of innovation or low degree of innovation. However, we assume that if they chose to work on higher degree of innovation, it would require them more work, more personal investment in order to get money to do research and to manage all the development process with the limited financial and human resources that small company most of the time implies. Then, leaders can also chose to work on lower types of innovation, still if they manage to find the sufficient resources to do it. So, the possibility of working on your own project, your own product, building your own team seems to be easier than in bigger companies. It can be assumed that smaller companies are more flexible, even if they might have fewer resources.

Moreover, thanks to our interviews, we have observed that in smaller companies as for example where leader 1 worked or leader 3, 4 or 5 are working, the decision to innovate often comes from the bottom, and is developed in a project manager level. So, we assume that this impacts clearly on the degree of commitment and responsibility of leaders. It seems to us that if they work on a project they are totally responsible for, they will be more involved than if they were just working in a small part of the project where decisions and production are made by other departments or in another location.

In big companies where leaders 1 or 2 are working, it seems that leaders are mainly involved in rather low degree of innovation, with incremental changes of successful products, but they can also be part of higher degree of innovation project. Moreover, we also assume that in big companies, the decisions about medium and high degrees of innovation are taken in a very high hierarchical level. This means that project leaders would not be responsible for taking decision and choosing in what project they want to work. So, it seems that the previous researches that we have reviewed about innovation from Wheelwright and Clark (1992), Moore, (2005), or Deschamps (2005) have been done more for biggest companies. Indeed, what we have learnt from their study seems to be verified: with a higher degree of innovation, the need of organizational change and investment will be higher, and as a consequence, the decisions are taken at a higher hierarchical level. However, it appears to us that for a lower degree of innovation, leaders in rather big companies do not necessarily need to wait for the approval of top management, and are more responsible. Leader 2 confirmed this information during the interview when he explained to us that small changes do not require to be approved by top management.
So, it seems that the complexity of taking decision seems to be higher in big companies than in smaller ones, especially when talking about medium and high degree of innovation. For example, if we take leader 3 working for one start up, leader 2 from a medium size enterprise and leader 1 from a big company, we can notice that for small companies working with high or medium degree of innovation, project managers are able to start a new project when doing most of the job by themselves, from the technical aspect to the marketing analysis through funds research. It can be complicated but not impossible. When we have a look to a medium size organization, we can see that the idea can come from mainly two ways, R&D or customers (Leader 3). In this case, the process is longer and needs to pass different types of decision meetings that involve every part of the company. This limits the chance of an acceptance and takes more time. When working in a very big structure, it can be assumed that it is really difficult to bring an idea to the market. Indeed, leader 1 who has worked with small and big companies explained to us that one of the main difficulties that reaches big companies is the lack of flexibility and the fear of failure. This issue in big company appears quite often when we heard our interviewees who have worked in both, small and big organizations (leaders 1, 3 and 4).

Linked to what we learnt in our literature review about innovation thanks to Wheelwright and Clark (1992), Moore, (2005), or Deschamps (2005), the degree of innovation has a big impact on the degree of responsibility and the level of decision making. For low degree of innovation, top management is less involved, the procedure is less heavy and project leaders take most of the decisions whatever the types of company. This has been confirmed by leaders 1 who is working in a big company, and leaders 2 who comes from a medium company and leader 3 from a small company. For higher degrees of innovation, we assume that the size of the company impacts more on the degree of responsibility and the level of decisions making.

Finally, it seems possible to link leader’s characteristics with the different degrees of innovation, the company structure and the responsibility of the leader. This will be supported by the table we developed in the literature review about the skills needed depending on the degree of innovation and responsibility.

First, it can be assumed that in small companies, a low degree of innovation would require the use of quite basic skills and traits. Indeed, it seems that a low degree of innovation is simpler to implement. Thus, it would necessitate less technical knowledge, or less determination to set it up. With a higher degree of innovation, that seems to be more difficult to implement in smaller company, we assume that leaders will need to use higher skills and traits. For example, as leaders will need to find more funds to finance their projects, they will need to be more determinate, and also maybe to have higher knowledge as higher degrees of innovation are more complex. Finally, in smaller companies, responsibility does not seem to be really impacted by the degrees of innovation. Leaders are generally responsible either for low degree or high degree of innovation.

Then, concerning bigger companies, it appears that with a low degree of innovation, leaders can have more responsibilities, as they do not necessarily need to pass by top management. Therefore, it can be assumed that leaders would necessitate using a mix of basic and higher skills and traits. For example, we assume that in lower innovation
degree, leaders do not need high technical knowledge skills, but as they are more responsible they can need to be more self-confident. With a higher degree of innovation, we assume that leaders from big companies would have less responsibility. However, it appears to us that they will still need to use quite strong skills and traits, such as high technical knowledge to manage the complex high innovation.

To conclude on this part, it seems that the statement made by Wheelwright and Clark (1992), Moore, (2005), or Deschamps (2005) implying that a higher level of innovation would require higher hierarchical level decision can be confirmed for big companies, but must be nuanced in smaller companies where the degree of innovation has less impact on the level of decision/responsibility. Moreover, as we have noticed in the literature review, leaders’ characteristics would differ according to the level of innovation. But in addition, we need to mention that the characteristics of leaders also differ according to the level of responsibility that is influenced by the size of the company.

5.2.3 Innovation process

Another important part of the innovation context that we have mentioned in the literature review, and that we have observed during our interviews, is the innovation process and its impacts on the leaders (Cooper and Kleinschmidt, 1993).

Every leader we interviewed explained to us their innovative process. When combining every data, we came to the conclusion that it is almost the same global process for each company. From the beginning, the idea needs to be accepted by top management, and then it has to be analyzed by several departments to study the market potential and financial return on investment. This first step corresponds to the preliminary investment and detailed investigation step that we have explained in the literature review (Cooper and Kleinschmidt, 1993). Then, when the project starts its development phase, leaders have to keep contact with their customers in order to react to any new wishes or problems they could meet. Until the implementation of the product, they need to pass some gates where top management get reports and have a look on what they are doing. It is the testing and validation step before the production and launch of the product (Cooper and Kleinschmidt, 1993). So, the process used by our interviewees confirms the innovation process presented in the literature review (Cooper and Kleinschmidt, 1993). Moreover, all the interviewees explained to us that they have been confronted to some problems and issues linked to their innovation process. That is why we assume that during the process, leaders need to be determinate, and have the skills necessary to deal with issues and failure.

Moreover, when reviewing the different steps of the innovation process in the literature review, we have assumed that leaders would use different characteristics during the process. First, in the preliminary investigation and detailed investigation stage, we have assumed that leaders would need marketing and technical skills, as well as financial skills to analyze the feasibility of the product (Cooper and Kleinschmidt, 1993). We can assume that these characteristics can be been found in each leader we interviewed, as all of them were able to analyze the feasibility of the product they wanted to launch. Then, during the development phase, leaders would need to help to solve technical problem and to have the ability to react and manage a team (Cooper and Kleinschmidt, 1993).
This seems also to have been confirmed, as all the leaders we interviewed own these characteristics, they all possess problem-solving skills or communication skills or sociability trait that allow them to deal with this phase. Then, we have assumed in the literature review that the testing and validation process, as well as the production and market launch do not require leaders too many efforts, and thus quite few leader’s characteristics (Cooper and Kleinschmidt, 1993). However we can notice that leader 2 takes part to the implementation phase of project, which asks him to use financial and marketing skills.

During the innovation process, leaders must also combine every demand from the customer, their teams, other departments and top management in order to create a smooth connection inside the organization (Leaders 1 and 3). During the interviews, it was interesting to observe that all the leaders create their project thanks to a similar theoretical framework with steps and gates whatever the type of innovation and the size of the organization. Also, we have noticed that the innovation process can last from few months until three years (Leader 2, 3) or even more in research area according to leader 5 (from ten to fifteen years).

Then, at each stage of the innovation process, before the development stage, leaders in innovation have different meetings with people involved in the project. Some meetings are created for R&D, marketing and finance (leader 2). Then other meetings are made with top managers and during all the process they continue to have regular meetings, weekly generally in teams and monthly or every two months with top management (leaders 2, 3, 5). The meetings would depend on the size of the company, the amount of issues they can meet and how well the communication is made. For big companies, it seems that the processes are more structured (leader 1) and for smaller companies, meetings and decision would be less structured (leader 3), that make them more flexible and more reactive.

In addition, we have observed that the context of innovation impacts on leaders in a way that they would need to work with all parts of the organization. Indeed, they can have close relationship first with their teams mostly composed by R&D people working on improvement or creation of the new product, such as leader 1 or 2. They can also have to work with marketing in order to identify target market, to analyze the environment, and launch the product in the right way (Leaders 2 and 3). Moreover, we assume that leaders can have close relationship with finance, because they need to estimate costs, reduce costs and price the product. It seems that leaders could need to be close to sales persons in order to get feedback from customers, but also to understand better how to sale the product. They need to give reports and have meetings with top management, in order to get their support in term of investment and resources management (Leaders 1, 2 and 3). All these relations inside the company show us pretty well the hard work a leader in innovation needs to face.

In a small company, there are limited resources and leaders need to learn all company aspects: to do finance, marketing and R&D by themselves (Leader 1 and 4). So we assume that it will require leaders to develop specific skills. In bigger company, you need to have permanent relationship with other functions (Leader 1 and 2), which can be linked to the sociability trait of leaders and their communication and relationship skills that we have observed in the literature review. Finally, we can state that with all types of innovation or organization a leader is working in, he/she is the real engine of
his/her project and needs to make everything go in the right way. From high innovative project as leader 5 from a small company is working in, to lower level of innovation that leader 2 from a medium company is working in, they both need to give all their energy to interact with others, and bring the project to success.

Adding to that internal aspect, we noticed through the interviews that a leader in innovation needs to keep an eye outside the company in order to get permanent information from customers and from the market. This is an aspect that we have not noticed in the literature review. In smaller companies, it seems that leaders would need to go to look for investors, they would need also to go to sell their previous products in fairs or exhibition in order to get revenue to progress in the new innovation they are working on (Leader 1 and 3). The context of innovation also obliged leaders to be very flexible and quick in their decision in order to react to any problems, to save money and give the best product to the customer (leader 1). Finally, we also noticed that working with innovation is very demanding for leaders, because they can have pressure from upper managers, they can need to get financial results, to finish the project on time. They also have to manage a team with setting clear objectives, and keep them motivated. Thus, we assume that innovation is a risky area where you are obliged to work with uncertainty and pressure; this seems especially true in small organization where the financial aspect for developing new idea is the most critical one.

To conclude, the world of innovation is quite complex and very demanding for leaders. Indeed, it appears that the size of the company, the level of innovation and responsibility as well as the innovation process impacts on leader’s work, and requires them to use different traits and skills that we will analyze more in the following parts.

5.3 Traits Analysis

Through the literature review, we have observed different traits that characterize leaders, and leaders in innovation according to previous research. We have assumed that the main traits of the leaders can be categorized under four main traits. First there are the cognitive abilities, then the confidence that a leader have and can release, leader’s sociability and finally determination. Moreover, we have noticed that leaders in innovation could have different traits that could in a way complement the main “basic” traits of leaders.

Through the interviews, we have observed the different traits of our interviewees. First we have tried to identify if the main basic traits that we have found were present in our interviewees, and then we have also tried to discover other traits that own our interviewees and could be related to the context of innovation in which they are working.

5.3.1 Identification of basic traits

First of all, we have observed that the basic traits that we have defined could characterize our interviewees. Indeed, concerning the cognitive abilities, we have
observed that the interviewees own the cognitive abilities that allowed them to perform their job. Obviously, it was impossible for us to ask them directly if they were intelligent, but by discussing with them, we were able to notice that they all own cognitive abilities necessary to perform their job. Indeed, they all possess the necessary educational background, or past experiences that are necessary to do their job well. Two of our interviewees, leader 1 and 5, possess a PhD, and the other ones had the educational background or past experiences required by their actual job and position. They were capable to gather enough knowledge to get their diploma but also to learn by themselves and get positive experience from their previous jobs. That shows us that high cognitive abilities are needed in order to get knowledge to perform their job. Moreover, some cognitive abilities are especially required in innovation, which is a particularly dynamic context. People working in innovation must be able to adapt rapidly to the situations. We have found this capacity in all of our interviewees. Indeed, we can argue that as all of them own backgrounds that were different from business, but they were all able to adapt themselves to the different business issues they needed to face. Cognitive abilities are important to gather information and use it in the right way, to then manage to perform their job in a complex context that is innovation.

Then, through the interviews, we have clearly identified that the interviewees were sociable. Indeed, we have noticed that it was really easy to talk to them. They have all spoken easily about their job, and made us feel comfortable during the interviews. Moreover, they all mentioned very good connections with other part of the organization, inside their team and outside the company. Leader 3 mentioned that his main objective when meeting a new customer or partner is to get friend with him, and leader 5 mentioned that she likes people, she likes the social relationships that are built during coffee breaks. Then, leader 1 declares that there was a “very smooth atmosphere” with his colleagues, as well as leader 2 who states that he works closely with other departments in a nice atmosphere. Moreover, we can notice that leaders 2, 3, 4 and 5 argue that it is really important that people involved in a project in the company could give their opinion easily. It is especially important in an innovative context, where the creation of new idea can emerge from interaction between people.

Confidence is also a trait that we have noticed through the interviews. First of all, self-confidence is a trait that appears quite clearly especially for leaders 1 and 2, where the interviewees have to propose new projects. Indeed, both recognized that they had the capacity to believe in the project they propose, which is particularly important in an innovative context. Also, we have observed in the literature review, when defining the four main basic traits, that leaders should release a certain confidence which is linked to the idea of honesty. This trait has been clearly identified during the third interview when leader 3 directly told us that he thinks as essential the fact to be honest. He explained to us that by being honest, he could gain a certain confidence from others. Moreover, he really declared that this trait was part of his personality, and not something that he has developed to gain business competences.

Finally, determination is also a trait that appears quite clearly for leader 1, 2 and 5. Indeed, the interviewees told us that when one of their projects was rejected, they tried to improve it in order to be accepted. They all try to find solution when meeting a problem, and do all what they can to keep a project alive. Even if they know to give it up when there is no other possibility because of legal reasons or financial reasons.
Determination appears as a trait particularly important in the innovation context, especially when you have to propose new products.

To conclude, the main traits that we had defined in the literature review as the most important traits of leaders were easily identifiable. Moreover, it is easy to link some of them with the innovation context, such as the cognitive abilities and determination.

5.3.2 Complement to basic traits

In addition, we have observed other traits that can come to complement the main traits that characterize leaders. The first traits that appear through all the interviews are the fact that the interviewees had a desire to improve themselves. Indeed, all of them own an educational background that was not linked to business. However, in their current job, they all needed to develop some business capacity. Some of them told us, especially leader 2 and 3, that they desire to improve their financial abilities, while other would like to improve the way they motivate people (leaders 4 and 5). Anyway, they all told us that they possess this desire to improve themselves to have better competences. This desire to improve their competences can be linked to the cognitive abilities. We can say that they are curious to learn new things that would help them in their job. This trait can be linked to the traits of leaders in innovation defined by Dubrin (2010, p. 351). Indeed, Dubrin states that leaders in innovation are usually intellectually curious, energetic, and persistent. We can link these traits to the desire to improve, because in order to improve themselves, leaders need to be curious, energetic and persistent. Persistence is also linked to the idea of determination that we have identified previously. This desire to improve is particularly important in an innovative context that is constantly evolving.

Moreover, this desire of self-improvement is also particularly adapted to the innovation context, where people need to be quite multidisciplinary. Indeed, we assume that working in the innovative context requires being particularly adaptable. It is a context that evolves quickly. Then leaders need to be able to adapt themselves and the innovation to new situation, by developing new skills. These skills are easier to develop if you own as personal trait the desire to improve yourself. We can notice that in small companies, leaders are particularly multidisciplinary. It was really the case for leaders 4 and 5. For example, leader 4 works in a small innovative company, which requires her to perform some tasks, such as the management of the salaries. Finally, we can notice that this trait has been observe by Bell (2010, p. 50) when he declares that leaders in innovation need to constantly adapt to the context.

Another trait that appears through the interview and which can be linked to the previous one, is the fact that two of the interviewees recognized to be hard-worker. Indeed, leaders 1 and 3 clearly stated that they are hard-worker. They have the capacity to set some goals and to work hard in order to reach them. Thus, as mentioned before if they want to develop a certain skill that will help them in their job, they would have the capacity to do that thanks to their trait of hard-worker. Moreover, if they need to make an offer to propose a new product, they would possess the capacity to work hard on this project in order that it was accepted. This trait is a new trait that we have not identified through the literature review. It seems particularly useful in the innovative context when leaders could have to implement new projects with high degree of innovation, such as leader 1 or 3, which can require lots of work.
This capacity to work hard can be related to the fact that leaders can be also defined as people who dare to start a project. They are **enterprising**. Indeed, this trait has been made particularly clear especially by leaders 3 and 4. They told us directly that it was important to be able to start a project, to do things. Even, if this includes taking some risks. Leaders must be able to take this risk and to embark in a project in which they believe. This characteristic can be included as a trait, and can be related to a kind of self-confidence. Leaders need to believe in their project, to have a certain self-confidence to dare to start it. We assume that the capacity to dare to embark in any project is a trait, even if it is something that can be developed by gaining experience. Indeed, even if it is a trait that can be developed through time, self-confidence, and the capacity to dare, is something that pertains to the personality of people. We can assume that, even with experience, some people would never dare to take decision, or to launch a project. This idea of taking risk can be linked to the trait “thrill-seeking” defined by Dubrin, (2010, p. 351). Moreover, we assume that the capacity to dare to start projects is particularly important in the innovative context. It is particularly important when it deals with a high level of innovation. Indeed, when there is a high level of innovation, you need to be able to take some risk, to dare to embark in a project in which you believe. However, this capacity stays important even in smaller level of innovation. Indeed, as we have observed during the interviews, especially in interview 1, 2, even if your aim is simply to improve existing product, you need to believe in your project, and dare to offer some improvements that you believe could improve the product.

To conclude, thanks to the interviews, we have observed that the main traits that we had defined in the literature review can be found in our interviewees. In addition, the interviews have enabled us to discover other traits, or some complements of the “basic” traits that appears to be particularly useful in the innovative context. But as mentioned in the literature review, traits are not sufficient to define a leader. That is why the next part will focus on the skills we identified in the leaders we interviewed.

### 5.4 Skills Analysis

During our readings about leaders’ skills, we have distinguished two main types of leadership skills (Weber et al, 2009; Gallagher et al, 2010). First, the technical skills composed by basic technical skills, business management and organizational skills, and strategic skills. Then, there are the non-technical skills that are composed by communication skills, relationship skills, managerial, problem/opportunity skills and vision skills. We assumed through the table we developed in the literature review named “Skills needed depending on the degree of innovation / responsibility” that the amount of technical and non-technical skills of a leader in innovation would depend on the degree of innovation and the degree of responsibility.

#### 5.4.1 Technical skills

We can start with the technical skills we have noticed in our readings and during the interviews.
First, we can focus on **basic technical skills** defined by Gallagher et al. (2010). We assumed in the literature that that these first basic technical skills are essential given that they permit to establish the basic knowledge that is necessary to enter a particular area. We assumed that all the leaders we interviewed possess these basic technical skills. Indeed, when we observed the educational background and past experience of leaders we have interviewed, we have noticed that they all have at least basic technical knowledge that allow them to perform their job. They all have engineering or technician university backgrounds. We can also observe that leaders who are working in the most highly innovative industry, such as leader 1 and 5 in pharmaceutical industry, are the ones who have the highest educational background in their area. Indeed, these two leaders have a PhD in their specific area. They told us that this high level of knowledge is necessary to perform their job well, so we assume that it is a basic technical skills. Moreover, in order to keep their knowledge updated in their area, they continue to read a lot about new research and about what their competitors do (Leader 1 and 5).

Moreover, as mentioned in the literature review, the basic technical skills are necessary for all types of innovation and responsibility. All the leaders we interviewed come from different companies and deal with different level of innovation and responsibility. Given that they all have basic technical knowledge, we can assume that it confirms that basic skills are found in all types of innovation and responsibility.

Then, **business management and organizational skills** concerns the global knowledge of leaders about business. First of all, we have noticed that all the leaders we interviewed do not have business educational background. No one came from business background and they had to learn everything about management and business administration by themselves. One of them uses the expression “learning by doing” (leader 1). That means that they all get basic knowledge about management thanks to their experience and not thanks to their education. It confirms that they own at least basic business management and organizational skills. Moreover, even if they have not study management before, they have, except leader 5, all several experiences in at least one to four other companies that give them the possibility to understand how a company works. They have also occupied several functions in these different organizations, such as technician, engineer, project manager, product managers, department head, leading position... All these working experiences have given to them a real overview of what is the organization, what problems or issues they need to face. Several of our interviewees (leader 1 and 5) mentioned the previous bosses they get, previous managers they had when they were working in different organizations. They told us that they have learnt a lot by observing these leaders.

Moreover, some of the leaders also had some extra education as managerial one (leader 3, 4 and 5). This was made thanks to companies’ trainings about management or basic university class. We already knew that innovation is a technical aspect of the organization, but we could have thought that leaders in innovation would get at least trainings from their company in order to have basic knowledge about managing a team, managing the innovation process, planning or know little about finance and marketing. Four of them told us that they had some lack in term of finance or marketing that they would like to improve (Leader 1, 2, 3 and 5). This means that only technical knowledge in their innovative area (such as bimolecular knowledge, or engineering knowledge) is not enough in innovation whatever the type of industry. Nevertheless, we assume these
technical skills help them in three parts of their job: one is the understanding of the product they are working on, then to be credible to their customer, and the last one is to be able to find solutions easily and quickly. As mentioned before, leaders 1 and 5 who are working in very precise and technical area explained to us that it would be impossible to manage a project without high level of technical knowledge. We can assume that this means that without enough knowledge in the area you are working in, it is almost impossible to manage well a team, plan a project properly or take right decision.

In the table we developed in the literature review about skills needed according to the types of innovation and responsibility, we state that business management and organizational skills must be found in medium and high degree of innovation and responsibility. All the leaders we interviewed deal with high or medium level of innovation, and have medium or high responsibility. As they all possess business management and organizational skills, we can assume that this statement is confirmed.

Finally, in the literature review, we have assumed that with higher level of innovation and responsibility, leaders would need some **strategic skills**. These skills are defined as the ability of leader to use technical tools to evaluate the company environment. It can concern financial tool or managerial tools (Gallagher et al., 2010). As all the leaders we interviewed did not have business educational background, none of them owns the strategic skills that give them the ability to use high technical tools. However, leader 5 who works with high degree of innovation and has high responsibility as head of department, told us that she would wish to know more about technical tools, and learn how to use them. So, she has a desire to develop her strategic skills.

To conclude, we can state that except for the strategic skills, the leaders we interviewed possessed the technical skills that we have defined in the literature. Moreover, it appears that the skills needed depending on the degree of innovation and responsibility that we developed in the table from the literature can also be confirmed.

### 5.4.2 Non-Technical skills

First, we can start to analyze **communication and relationship skills** of the leader in innovation. All leaders in innovation we met told us that innovation involves almost every part of the organization, and they also need to get feedback from the customer, make them tested the product and prepare them to buy future product. For the inner relationship and communication, everyone explained to us that there are good relationships between members of the organization while working on an innovative project.

Moreover, thanks to our interviews, we have observed that communication needs to be very well done by leaders, because there are lots of parties who are involved in innovative projects. Leaders need to keep them informed at each step of innovation process in order to avoid risks of misunderstanding. Leader 5 especially emphasizes this point. The importance of communication is also highlighted by the fact that all leaders we interviewed have everyday talk with other teams’ members, or weekly talk while giving report to top management regularly to explain them the advancement of the project. It appears that leaders must also have the ability to understand and to listen
Characteristics of leaders in innovation

others thoughts, and take them into consideration when taking decision, as leader 5 especially mentioned.

External communication is also important for the innovation and it can be assumed that leaders have to meet their customers often to understand what they want and make adaptation of their product during the process (leaders 2 and 3). They must also make their customer test the product and make them want the product or future product that can interest them. It is crucial for them to get the information from the market. They also need to keep very good relationships with their partners and customers in order to have long term and trustful relationship (leader 3).

Also, leaders 3 and 4 have mentioned something concerning communication that has caught our attention; it concerns the Scandinavian way of taking decision and communicating. This is for them very important that everyone involved in the innovation can give his/her opinion in order to take right decision in the project. From the employee to the CEO, everyone can give their opinion and say “I disagree”. Then they assumed that this method is a real advantage while working in innovation because it permits to be fast and very reactive throughout the innovation process. Working like that seems to help leaders to manage their team. All people who are involved in the discussion will give their opinion during the meeting and then everyone can move in the same direction without influencing the development of the project. That helps also for the internal communication between the project teams and with people involved in it.

Moreover, we have also noticed that two leaders that we have interviewed (leader 1 and 3) are working in an international environment. The first one who has some living and working experience out of Sweden was able to manage easily working in different language and with different culture. He has also to manage the communication about his project to other members of his team who are located in another country and have another culture. He told us that it is not always easy to work with a spread team and keep everyone involved in it. You need to have very good language skills as English speaking and writing. Leader 3 is working closer to his customer and need for that to travel a lot. When talking to him we could notice that he enjoyed relationship with people from all over the world. These two examples indicate that working in an international environment is very common in these days and requires language skills and relationship skills in order to manage it well.

So, we can assume that nowadays, with the globalization, leaders in innovation can need to work with people in multiple locations, organizations. It can leader them to develop new skills to deal with, such as being able to speak a foreign language, or to adapt to another culture. This point has been mentioned in the literature (Gallagher et al, 2010).

To sum up, we can assume that all the leaders we interviewed possess the communication and relationship skills necessary to perform their job. Moreover, we state in the literature that these skills should appear for all degrees of innovation and responsibility. As all of the interviewees deal with different degree of innovation and can have different degree of responsibility, and due to the fact that they all possess these skills, we can assume that what we have learnt in the literature can be confirmed.

Second, we will continue with analyzing the managerial skills. Thanks to our literature, we learnt that leaders in innovation would need to have managerial skills that
help them to organize, lead and control activities and team (Gallagher et al, 2010). As we mentioned in the non-technical skill part of the literature review (Gallagher et al, 2010), leaders need to set task and objectives in order to give a clear vision to their teams and conduct the innovation process in the right way. During our interviews, leaders, especially leaders 2 and 4, mentioned the fact that it is crucial for them to set clear objectives at each stage of the innovation process in order to make everyone involve in the project. Not only member of the team, but also top management. Indeed, we assume that top management must also know what their project leaders are doing and see if the project has the same objectives as what have been decided at the beginning (leader 4).

All leaders in innovation we have interviewed work as project managers, and know how to plan, how to organize and manage a team. The only thing is that they learn this more by doing rather than thanks to education or training. Here there is maybe a problem that we can highlight. It seems that companies who hire or make people working on projects in innovation look more at their technical abilities in their working area than their business qualities. However, all of the interviewees mentioned that they would really like to improve their business knowledge, finance knowledge or marketing knowledge in order to be more efficient, because after all they are making money and business. It is the main aim of their job to save money and make money. So it would seem logical that companies could also have a look on the business side of leaders in innovation, and propose training or partnership with university to offer some educational programs in order to complete the knowledge of their leaders in business administration.

To conclude, we can assume that all the leaders we interviewed own the managerial skills necessary to perform their job. In addition, we have stated in the literature review, through the table (table 3), that managerial skills would be more needed in medium and high degree of innovation and responsibility. All the leaders we interviewed work with medium and high levels of innovation, and have medium or high levels of responsibility. As a consequence, as they all demonstrate managerial skills, it appears that our statement would be confirmed.

Finally, leaders in innovation must also have problem and opportunity skills as well as vision skills in order to solve problems, find opportunities and manage their team. Our literature review highlighted the fact that a leader needs to be able to solve problems and identify opportunities (Gallagher et al, 2010). As we have seen previously, our interviewees own many technical skills and are able to react quickly when technical problems occur. They are even capable to identify them proactively in order to avoid some problem (leader 2 and 4). But when it concerned non-technical issues as human issues in the team, it is more complicated for them to identify them before they occur. In this case, it seems that leaders would need very good relationship, listening and also diplomatic skills in order to solve them quickly and avoid them to affect the project.

Concerning opportunity identification and vision skills, all the interviewees agree that they need to be close to the market, and to their customers. With only staying in their office, they would never be able to find out what the customer want, and visualize the market properly. This requests them very good qualities of visioning and observation. It seems to us that not all leaders in innovation have these skills; it depends on which part of the company they are and what were their previous experiences. When having sales
Characteristics of leaders in innovation

backgrounds or when they work close to the customers, travel a lot to meet partners, (such as leaders 2 and 3) it can be assumed that they are more able to identify new opportunities than those who are more focused on R&D or internal organization.

In the literature review, we have assumed that problem and opportunity, and vision skills should be more present with high degree of innovation and responsibility. However, the data that we gathered through the interviews do not allow us to confirm this assumption. Indeed, we have observed that leaders 2 and 3 would have opportunity identification and vision skills, yet leader 2 works with low or medium level of innovation, and both leaders 2 and 3 do not have a high level of responsibility.

To conclude, we assume that the analysis of skills has allowed us to confirm that the skills that we have observed in the literature part can be identified in the leaders we interviewed, except for the strategic skills. Moreover, we assume the assumptions that we have made in table 3 are for most of them confirmed too. Only the assumption stating that problem and opportunity skills as well as vision skills should be present with high degree of innovation and responsibility has not been confirmed.

5.5 Combination of traits and skills in the innovative context

Through the literature review, and the interviews, we have noticed that leaders need to own certain traits and skills in order to perform their job. It is essential to highlight that they are not independent characteristics, but a link exist between them.

First, the cognitive abilities have an influence on the development of skills. Indeed, it can help leaders to get knowledge necessary to perform their job. For example, all the leaders we interviewed did not have business knowledge, but thanks to their cognitive abilities, they have been able to learn how to manage business issues by themselves. So, thanks to the trait of cognitive abilities, leaders are able to develop technical skills.

Moreover, all the interviewees have the desire to improve themselves. Indeed, they want to update the knowledge they own (leader 5), or want to acquire new knowledge. So, the desire to improve themselves can help leaders to acquire technical skills.

This will to acquire new knowledge thanks to their cognitive abilities and their desire to improve themselves is really important for leaders in innovation. Indeed, innovation is an area that constantly evolves and that requires specific knowledge in order to perform a job well. So, in order for leaders to be performant, it can be assumed that leaders need to own cognitive abilities and a desire to improve themselves that enable them to get the necessary knowledge to perform their job.

Then, we assume that sociability is a trait that is really useful when working with others. Indeed, we have noticed through the interviews that working with innovation implies many relations with different persons inside or outside the company. It can be assumed that for managing their work well, leaders need to develop relationship and communication skills. This seems to be helped by their sociability trait.
Developing relationships and communication skills thanks to sociability trait is crucial in the innovative context. Indeed, all the leaders we interviewed declare that innovation requires a good communication inside and outside the company. This permits first to keep aware of what happens in the innovative field they are working in. Then, we can assume that communication plays an important role on creativity, which is a crucial factor in innovation. If every people in organization can share his or her idea thanks to a good communication, it can enable new ideas to emerge. So, sociability trait would enable to develop relationship and communication skills that play an important role in the innovative context.

Then, it appears to us that confidence is a trait that helps to get managerial skills. Indeed, leaders in innovation need to set the directions of a project to their team. For that, they need to be self-confident, and make their team trust what they say and decide.

Developing managerial skills thanks to confidence trait is really important in innovation. Indeed, when leaders want to launch a new idea, a new project, they need to be self-confident enough to make their team follow them. And, in order that the team follows them, they need to set up clear and right directions in which they believes. So the leaders need to release confidence. Moreover, they also need to be self-confident especially in high degree of innovation. Indeed, we assume that when they launch a really new product, leaders do not have a clear path, they are pioneers. So they need to be self-confident enough to build the first path. Thus, developing managerial skills thanks to confidence trait is crucial in innovative context.

Determination and the fact to be hard worker can be easily combined with problem-solving skills. Facing a problem, leaders should be able not to be discouraged, to work harder, and make the changes necessary to solve the problem. For example, when leader 2 proposes a project that has been refused by top management, he continued to improve it until success.

It is quite easy to understand how developing problem-solving skills thanks to determination and the fact to be hard-worker can be linked to innovative context. Indeed, when leaders start to work on an innovative idea, especially when it is a high degree of innovation, they are not following any path. They have to build it. This is not an easy process, and leaders would really likely face some difficulties. That is why being determinate and hard worker can help them to develop problem-solving skills.

Being enterprising helps leaders to develop vision skills. Indeed, it pushes them to observe and analyse their environment in order to choose the right opportunity to start a project. For example, leader 2 and 3 analyse carefully the needs of their customers to identify new opportunities, and therefore undertake a project that answer the demand.

So, developing vision skills thanks to enterprising trait is really useful for leaders in innovative context. Indeed, analysing the innovative environment where they are working in might help leaders to propose relevant ideas, which can therefore help them to be competitive in their field. Thus, developing vision skills thanks to enterprising traits is really useful for leaders in innovation.

Finally, innovation is a very changing and complex environment, where uncertainty reigns. Being adaptable is therefore a trait that is crucial for managing innovation.
Characteristics of leaders in innovation

project, and also solving problems. All the leaders we interviewed possess this trait, especially leaders 1, 3, 4 and 5, that were working in small companies, and therefore needed to be multitask.

To conclude, as mentioned in the literature review, traits and skills are closely linked. Traits can be viewed as bases to develop skills.

The scheme below, show the link between traits and skills explained before, and its practical consequences. The addition of all these traits, skill and practical consequences would reach to successful innovation leadership.

![Diagram showing the link between traits, skills, and practical consequences]

Table 5: combinations of traits & skills that lead to a successful leadership in innovation.
6 Conclusion

This last chapter will present and discuss the findings of this research as well as the contribution of this study to new knowledge. Finally, we will propose suggestions for further research.

The objective of this study was to answer our research question:

What are the characteristics of leader when managing innovation in organization?

This question has brought us to study three different aspects. One is the context of innovation where leaders are evolving, and the two others are the traits and the skills that a leader in innovation need to own in order to manage the innovation process.

Then, thanks to comparison and completion of our readings from the literature review with leaders’ interviews, we have managed to reach different findings that answer our research question.

First, after comparing our readings from the literature about innovation context, and the data from the interviews, we have made an important discover that was not mentioned in our literature review. It deals with the fact that the complex context of innovation is not the only one that leaders need to manage. Indeed, they also need to adapt to the types of company they are working for. So, the way leaders manage innovation would depend on the innovative context, including the types of innovation, and the innovation process, as mentioned in the literature review, but also on the size of the company. Indeed at the end of the context analysis, we came to the conclusion that the world of innovation is quite complex and very demanding for leaders and require them to use different characteristics according to the level of innovation, the innovation process and also the size of the company. Indeed, we can assume that the size of the company would also plays an important role on the way leaders manage innovation and impacts on the characteristics they use to manage innovation.

Secondly, after analysing the context where leaders in innovation are working in, it is important to distinguish which characteristics would help the leader to deal with the innovative context.

After our readings, we have distinguished some main basic traits characterizing leaders that help them to manage organization, project or team. Four of these traits have been confirmed after interviewing leaders in innovation: cognitive abilities, sociability, confidence and determination. Moreover, we have been able to identify four other traits that can complement the basic ones. Indeed, leaders in innovation need to have the will to continuously improve themselves in every area of their job, they need to have the capacity to adapt themselves to different situations and problems. They also need to be enterprising and have the capacity to work hard to manage any situation.

Thirdly, as we have mentioned in the introduction, traits are not sufficient to explain which characteristics a leader should own in innovation. It is essential to add skills to these traits in order to have a complete vision of leaders’ characteristics. Leaders in
innovation need to own two types of skills, first technical skills that are composed by knowledge necessary in the area they are working in. Completing technical skills, leaders in innovation need some non-technical skills. They are composed by communication and relationship skills, the ability to identify new opportunities and solve problems, managerial skills and vision skills. The analysis of the interviews has allowed us to identify most of these skills.

Finally, our analysis of the skills and traits of leaders in innovation has highlighted that there is a link between traits and skills. Indeed, traits would be a basis to develop skills. Leaders in innovation own some traits and skills that can be combined in order for them to perform their job in an innovative context.

Overall, we can conclude that no research has been made about leaders’ characteristics in innovation with analysing both traits and skills. In our study, we have managed to distinguish what are the main characteristics (that is to say a combination of traits and skills) that a leader should have in the very complex and challenging environment of innovation. According to our study, the characteristics that compose leaders in innovation would consist of the combination of the personal traits that we have identified with the skills that we have distinguished, which would depend on the level of innovation, the innovation process and the size of the company where leaders work.

Finally, the world is moving fast, and companies compete more and more in a global market where innovation is one of the keys to bring companies to success. Innovations will increasingly progress in companies and leaders in innovation will need to face more and more challenges. Leaders in innovation will need to consciously improve and get more skills. Recruiters will have to select people that have a high capacity of managing in a very complex environment. Companies will more and more look for high potential personalities who have specific traits that will make them ready to face any situation. Thanks to our interviewees, we have noticed that companies seem now to want complete leaders dealing with innovation, which have high technical skills, and also high managerial and business skills, that permit them to be global leaders.

### 6.1 Further research

After analysing leaders’ characteristics in innovation thanks to a combination of traits and skills, it would be interesting maybe to compare our findings about the innovation context with another context, in order to identify differences about types of leaders in organization. It would have been also interesting to have a more psychological analysis of these traits and skills linked to innovation, but it would be another subject area, where we are not competent in.
7 References


8 Appendix

Interview guideline:

Understand the context a leader in innovation is working in:

Can you explain us what the company is doing precisely? 
Can you tell us what is your job in the company and explain us what is your mission? 
Can you describe the innovation you are working on and how works the innovation process?

Find out Leaders’ skills:

*Technical:*
What education have you done and what working experience do you have? 
Have you followed training during your career? And about what? 

*Non-Technical:*
What is your reaction when you meet a problem or failure? 
How have you plan your project? Which decision you need to take? 
How is your relationship with your team and other member of the company? 
How you communicate between each other?

Find out Leaders’ traits:

Do you like your job? What do you like? What you don’t like? 
Do you think that your personality impact the way you take decision and manage your team? 
As a leader what would you like to improve to be more efficient in your role of leader? 
What are your strengths? Do you have some point that you would like to improve?