Drivers' match that foster Employee-Driven Innovation: A cross-case study of Product Performance Innovation

Authors: Karl Abi Karam
Juan Fernando Carrión Ullauri

Supervisor: Prof. Sujith Nair

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Umeå School of Business and Economics
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Acronyms

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<td>B2B</td>
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<td>B2C</td>
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<td>CIPD</td>
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<td>EDEI</td>
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<td>Emotional Intelligence</td>
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Abstract

Big, prosperous and outstanding notable corporations regularly rely on work climates that develop and encourage creative comportments and attitudes. Employees are the most important dynamic behind the creative innovation process; therefore, their engagement is seen as the combination of emotive, lucid and social extents of enthusiasm level, commitment, and attachment to their job tasks. Additionally, firms progressively empower their workforces to conduct research and generate creative ideas. The purpose of this research is to recognize drivers’ combinations and mechanisms directing the employee-driven innovation concept.

Understanding employee-driven innovation relies on grasping and understanding the connection between employee engagement and innovation or creativeness. Therefore, in the proposed study, understanding each of the concepts is crucial so to recognize and investigate the link between the theories.

The first section of the study is related to employee engagement. Many researches have focused on the connection between human resource management (HRM) and organization creativeness and innovation. Scholars have determined that human resource procedures, when applied jointly in a system form (i.e. high-performance work scheme) have a substantial and constructive influence on a firm's creative outcome. The aim of this part is to assess, discuss and examine existing empirical literature while emphasizing the different employee engagement mechanisms, drivers and shaping factors.

The second section is related to innovation and creativity. The literature associated with innovation management led to a rising number of diverse and distinctive models of innovation types and processes. This research relies on a 10 type of innovation model proposed by Keeley et al. (2013) in which the innovation dimensions interrelate and interconnect so to create distinctive, and interesting creative approaches.

The third section relates to employee-driven innovation. While some scholars argue about the definition, dependencies, and origin of the concept, the authors argue that employee-driven innovation find its source in the combination of a healthy employee engagement structure and a strong desire of the organization to innovate. The research proposes seven key drivers of employee-driven innovation: Managers and leaders attitude, Team culture - spirit and social environment, Work process - resource allocation, Job design, Corporal environment, Employee suitability, and Organizational values; each of these drivers has a certain impact in specific and critical innovation cases.

Consequently, the last part of the dissertation is based on four structured case studies, focusing on product performance innovation, that assess all the different concepts already proposed. The authors evaluate the different innovation patterns, the working environment governing the society, the firm and culture at the time of the innovation and the employee innovative process that lead to the materialization of his creativeness.

It is found that from these examples, different drivers supported creative, innovative and inspiring employee behaviors, depending on the technology, sector and organization vision. While there is no single driver inciting employees to innovate, there is a whole framework that should be understood and investigated by an organization so to lead the way for employee-driven innovation.
From a practical viewpoint, the research has eased the way for future studies and the development of management guidelines, which firms aiming to foster their employee creative behaviors can rely on. Moreover, the dissertation postulates valuable perceptions into a significant area of study as firms look for techniques and methods to realize competitive advantage through their employees and workforce.

**Key words:** Employee-driven innovation, Innovation, Employee, Work environment, culture, involvement, engagement, drivers, process, and mechanisms.
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I. Introduction

1. Context

In the era of globalization, race for competitive advantage, quick modernization and new emergence of business shapes, there is always a factor that drives change: Innovation. Yet, companies should seek strategies to reinforce their independence and proactive activities that can encompass an advantage over competitors (De Spiegelaere et al., 2014). Consequently, firms are counseled to look after any accessible source of innovation. However, although managers' ability to delegate projects, innovation, and implementation has often been well documented; to date, the manifold potential of employees' involvement and innovation development has hardly been studied in detail (Evans and Waite, 2010).

Employee-driven innovation, commonly known in the literature as EDI, refers to the creation and execution of noteworthy, original and innovative concepts, products, designs, processes, and ideas arising from the combined efforts of personnel and teams who are not already appointed to perform this task (Hull Kristensen, 2010). Accordingly, EDI notes that novelties and innovative concepts can arise from "normal" staff workers, coming from different backgrounds, cultures and across the borders of existing division branches and professions (Kesting and Ulhøi, 2010).

While quality management (QM) methods have arisen from the belief and conception that considerably redundant effort has been settled aside to adjusting errors (Kesting and Ulhøi, 2010), EDI has no specific techniques, but fortuitously and informally happens in distinct units of the organization from work performance and daily activities practiced in the workplace (Buhl et al., 2016). Moreover, EDI is a new character, practice, and sort of innovation that is likely to be overlooked by companies (Høyrup, 2010). Yet, in the technology development sector, where no clear targets can be foreseen, EDI importantly relies on the collaboration, involvement, and participation of the entire workforce (Evans and Waite, 2010).

EDI is principally an inverted process that firms and organization choose to adapt for multiple reasons from growth to innovation and competition. It embraces the theory of 'open innovation', where businesses struggle in relying only on their own research departments and training and look for joining forces of their private knowledge with external information and knowledge (Chesbrough, 2003). This philosophy of external expertise can be generated by forming networks between teams, workers and staff in businesses and between organizations, and institutions interaction (Høyrup, 2010).

In contrast with universal and commonly known business practices, EDI places the prominence of a new innovation driver: the organization’s personal workforces. This business-type innovation method fits in the wide group of non-technical improvements and modernization with high-involvement progression (Bjornali and Støren, 2012), which leads to the conclusion that EDI and innovativeness are important foundations of competitiveness (Aaltonen and Hytti, 2014). It gives a constructive vision of the readiness and enthusiasm of workers to be involved in innovative tasks and ideas while exploring the diverse tools and mechanisms that will help and boost their capabilities (Kristiansen and Bloch-Poulsen, 2010).

2. Research justification
The following study aims to deepen the academic knowledge of employees driven innovation, therefore contributing to setting and defining drivers that engage employees to create innovative products and services within their workspace. The calls of the following researchers were addressed by the study:

- Høyrup et al. (2012) emphasized the emerging, yet limited, drivers' character of Employee-Driven Innovation in the literature (p.188). Moreover, they highlighted the necessity of having EDI in a world without borders and with ease of access to information and technology. They state that machines, with all the technology that we arrived at, are not able to innovate, while people do enjoy creativeness (p.4).

- Directors looking for general performance improvement indisputably have to rely on their human assets intelligently (Stanley, 2016). Therefore, if effectively encouraged and engaged in their daily tasks, employees should come up with innovative and creative ideas. Therefore, Stanley invites researchers to question the conditions that foster creative behaviors and drive employee engagement.

- The last decades were revolutionary, and the employee-company relationship has changed considerably, inducing changes in the work structure and in the firms’ identity. Therefore, employees should anticipate taking work accountabilities outside their job boundaries (Li, 2016)

3. Research objective and question

As highlighted in the theoretical framework, up to the present time there are barely few and very wide, advanced studies and connections between employee engagement and innovation. Therefore, this study targets to refine the topic understanding by elucidating how an organization can manage its assets and capabilities so to boost their employees' creativity in an intrapreneurial context. The study helps discovering the firm's responsibility towards its employees and the importance of applying employee-driven innovation within organizations. Per se, it explores the process of inciting employees to create innovation. In particular, an analysis of the employee engagement mechanisms will be conducted, while exploring the outcomes of such the engagement. Furthermore, an analysis of the types of innovation proposed for an employee to rely on will be conducted, while investigating the innovation process that should be followed. Acquiring such research insights will enable understanding the pillars of EDI, and provide pre-requisite to understand the values proposed by the EDI conception. To begin with, the study objectives can be outlined as follow:

1) Discover the mechanisms, limitations, and drivers of the employee engagement concept within the product performance innovation frame, while outlining its positive outcomes.
2) Explore the drivers’ patterns behind EDI in the product performance context, and the opportunities of generalization of the findings.
3) Understand the power impact of each driver and look for the existence of primary and secondary drivers.
Hence, considering the above-mentioned research objectives the central focus of this thesis research will be followed by the following research question:

**What drivers' match does foster employee-driven innovation within a product performance innovation context?**

To answer this question, the proposed objectives will direct the investigative study, which aims to improve the knowledge on this contemporary, not well-investigated concept.

**4. Literature selection**

The aim of the literature review is to grasp offered works of literature in both employee engagement and innovation. There are contrasting opinions on the significance of a literature review because of a possible bias that may result from a deep research study into literature; however, Webster & Watson (2002) highlight that a former review of pertinent and appropriate literature is a crucial and fundamental feature of any scholastic task.

Limited literature has been conducted on the Employee-Driven Innovation topic, resulting in a scarce number of key journal articles and papers regarding the subject. To face the challenge, a set of journal articles regarding employee engagement was chosen from one side, and another set of papers regarding organizational innovation was selected on the other, so to be sure to cover all the academic aspects regarding EDI. The article search relied on Umeå library web engine and Google Scholar as the two source of literary material.

For the chapter related to employee engagement, the literature has numerous articles in the field, as well as case studies of renowned firms. The principal keywords used in this chapter were (also in permutation): employee, involvement, employee engagement, organizational attachment, worker participation, and contribution to decision-making.

For the innovation chapter, the principal keywords used for this chapter were (also in permutation): innovation, organizational invention, firm’s creativity, drivers of innovation, project manager innovative roles, and organizational innovative strategies.

And finally, the EDI section was the most challenging one in terms of the literature search. Therefore, the principal keywords used for this chapter were (also in permutation): Employee-driven innovation, employee creativity, worker self-development, EDI, employee’s skill development, employee learning, employee’s opportunities, driver for innovation, and creativity factors.

Selecting relevant papers that characterize “good theory” is crucial; therefore the chosen articles have to (Whetten, 1989, p. 494):

1) Be peer-reviewed articles
2) Have contributed to other knowledge development in different articles
3) Be published in ranked journals.
However, given the emerging study extent of employee-driven innovation, and the subsequent limited scientific articles that propose multiple views on a subject, conference papers and other non-conventional sources such as interviews, presentations and blogs were included.

In conclusion, it is important to point out that the literature review was based on back-and-forth process, where throughout the study when there is an important concept to be evaluated, it was consequently added to the literature part. For instance, when the concept of intrapreneurship was mentioned in the first case study (Post-it), it was relevant to discuss in the literature review the difference between EDI and intrapreneurship. The wide literature study presented concluding implications to the research question and exhibited the existing gap existing in literature, thus defending the drive of this research.

5. Research outline

Section One: Introduction
The aim of this section is to propose the theoretical background of this study and familiarize the reader with the concept of Employee-driven innovation. It provides an overview of the work, identifies the research gap and clarifies the research objectives and question, in addition to the work organization.

Section Two: Literature review
The literature review presents the theoretical framework that supports the recognized study propositions, providing new insights due to the combination of viewpoints and joint analysis. It strives to study and map the theoretical key perceptions and focuses to lead the research further. It splits into three parts, first it defines the employee engagement aspect, and second, it presents the organizational innovation aspect and finally proposes the EDI framework that relies on the perspective linkage of both concepts.

Section three: Methodology and theoretical framework:
This section will frame the motivations that drive the authors to lead the research study. It will outline the selected research philosophy, approach, and design of the research. Moving forward, the chapter will expose the data collection approach and techniques, by discussing the case studies designs and the rational choices made when selecting the contributing cases. Further, the section elucidates the data analysis procedure, guiding to emphasizing the ethical considerations that guided the research.

Section four: Empirical data
This section elaborates the analysis of the collected case studies’ data, regrouping different concepts provided in the literature review section starting from the employee engagement drivers to the application of the innovation types and categories.

Section five: Data analysis
The data analysis section examine and investigate four case studies related to EDI so to find and conclude recurring patterns and differences that emerge from the studies.
Section six: **Findings and conclusion**
First, findings from the data analysis section will be proposed, aiming to answer the research question by proposing a graphical model that enable visualizing the relationship between case studies of different backgrounds. Then will be presented a summary of the discussion in addition to the research limitations, authors' recommendations and recommendations for practitioners and future studies.
II. Literature Review

1. Employee engagement

1.1 Employee engagement definition

Engaging employees in business decision making and critical company resolution is gaining popular appraisal, however, it is a severely debated concept. On the one hand, it is well known because it had grabbed the attention of academics, was widely documented in the literature (Macey & Schneider, 2008), and was the center of attention of consultants and professionals working on improving the human resource management (Shuck & Wollard, 2010); it is a debated concept on the other hand, because of the absence of a universally agreed definition of employee engagement (Stanley, 2016) or the lack of agreement on a characterized clear method that measures employee engagement (Masson et al., 2008), or even on how and why employee engagement is a positive driver of organizational success (Rowley, 2014).

The literature discussing the model of employee commitment, engagement, and involvement is an emergent field. The attractiveness of the expression employee engagement grabbed the literature attention so to explore the conception supporting the terminology. Definitions and analysis of the wording understanding when referring to employee engagement vary considerably. It remains blurred and vague whether it is a stance, a conduct, a performance or a combination (Macey & Schneider, 2008). Due to this ambiguity, foreseen results of employee engagement remain dubious. However, it is commonly agreed that employee engagement is a human resource management (HRM) tool that creates a positive relationship between two parties: the management of the organization and the employee (Gallup, 2008).

Employee engagement is often described in the literature as a form of inspirational exercise, a communication scheme, and a form of psychological state (Rowley, 2014). Harter et al. (2002) advocate that the engagement and involvement of an individual is a form of satisfaction as well as enthusiasm to push work forward shifting them from being regular individuals hired by a firm to task owners and involved employees. Thus, it can be deduced that employee involvement intervenes in creating a contentment and cheerful factor between the firm and the work-engaged employee (Shuck & Wollard, 2010).

Employee engagement can be classified in a psychological context as suggested by Cook (2008). Cook believes that involvement is related to the internal state and inspiration feeling of an employee. He argues that employee involvement is related to the critical positive thinking of an employee, his mood and humor, and the results that the employee is providing. Involvement exists in one context according to Cook (2008) and this is when an employee switches from his willingness to achieve personal targets, to objectifying a passion. The passion in this context is converted into a power that boosts the employee into becoming more and more engaged within the organization (MacLeod & Clarke, 2009).
In contrast, Seijts and Crim (2006) describe employee involvement as a desire to work and create. They suggest that to be actively involved, it necessitates more than objectifying satisfaction. Rowley (2014) and Maslach et al. (2001) expand the idea further suggesting that employee engagement, and through combining energy and determination can create an effective sense of improvement wanting.

The employee engagement definition that will be adopted in the case of our research is described as the combination of various emotional (Kahn, 1990), balanced, social and interactive ranges of an employee’s dependable level of determination, association, commitment and motivation to perform assigned tasks (May et al., 2004). Motivation is the core of the employee engagement and is defined by Castellano (2013) as a motivational forceful driver, advising that an involved employee is an individual who has attained a great internal motivational status. Motivation eventually defines whether this worker's effective work potential is achieved or not. MacDuffie (1995) claims that skillful, well-informed and educated employees who lack motivation from the firm's principle and HRM are unlikely to add any innovative value in an effort to move the company in the right direction. In contrast, Employee with limited knowledge and narrow skills do try to go above and beyond the requirements when pushed to show an impact (MacDuffie, 1995).

Employee engagement showed through multiple definitions that it guides projects and organizations to valuable and positive outcomes. Understanding the concept, aspects, components, and drivers is crucial and will be evaluated in the upcoming chapters.

1.2 Mechanisms of employee engagement

Intellectual engagement, Affective engagement, and Social engagement are three contributing facets of employee engagement (Alfes et al., 2010). The intellectual engagement is introduced as the concept of attachment to the job and looking for improvement in the job tasks. The affective engagement characterizes the sentiments and positive attitude and emotion while performing a task. The social connections are described as taking advantage of occasional scenarios and experiences so to relate them to work practices and look for window of opportunities to improve (p.5).

Emotional intelligence (EI) is part of the affective engagement and is widely discussed in the literature. Ditchburn (2009) suggests that employee engagement relies on the emotional attachment to the work tasks from one side and to the firm on the other. He emphasizes that staff and workers should comprehend and appreciate the business's goals and core values, so to support the firm's business development and achieve a competitive advantage. Moreover, this EI can take different forms and in the employee engagement context, it is defined as enthusiasm to work. However, this enthusiasm should be complemented by a desire to seek improvement in their performance on personal and organizational aspects.

In contrast, Saks (2006) proposes that employee involvement covers both managerial and job engagement. However, in his studies, Saks claims that employees are more likely to be more attached to their job position or tasks rather than the organization and its values. From this perspective emerges the role of Human Resource (HR) and
HRM as a significant crucial driving factor and facet of employee engagement in boosting a firm's performance and development (Huselid, 1995), and accordingly, its sustainability (Appelbaum et al., 2011).

HRM can be viewed by certain critics in the literature as a cost center in firms and not as effective as other departments, however, research has statistically proven that HR plays a fundamental role in principally refining an organizational performance and boosts its bottom lines (Soltesz, 2016).

Consequently, the value of HRM inside a company can be regarded as a crucial element or driver of competitive advantage by creating more employee value than competitors. Thus the central duties of the HRM are simply procedural vis-à-vis employees (Soltesz, 2016). In other words, HRM's task is to empower new and existing value generating divisions and departments with new competent adding value employees or develop the skills of existing one in terms of guidance, monitoring and leadership directing.

Consequently, there are numerous interceding mechanisms that are to be referred to when describing innovative implementation work schemes and their influence on an organizational outcome. It can be concluded that HR practices (HRP) and HRM are essential to increase employees' expertise in the field of work, knowledge, and aptitudes. Furthermore, HRM through multiple practices can advance employees' inspiration, motivation and incentive to perform in consistent and innovative ways that go with the firm's strategy, vision, and objective. HRP has an indirect role in shaping the organizational framework or ambiance so to improve cooperative and team behavior and works as a motivating mean (Huselid, 1995). Actually, some academics advocate that high-performance work schemes are related to structural results in an organization by having an impact on the proficiency, capabilities and skills of workers and on their joint motivation to make use of their abilities in an unrestricted or unstructured method so to understand their strengths and make use of them for the advantage of the firm (Lepak et al., 2006).

1.3 Engagement limitations and shaping factors

A study conducted by Robinson et al. (2004) reveals that an employee's degree of engagement takes a header, as they grow old. Additionally, the study shows that the longer the length of attachment to a task or stagnation within a position, the more employees lean towards decreasing their level of engagement accordingly. There are empirical studies advocating and supporting the concept of differences concerning ethnic and cultural origin from one side and implication and commitment levels on the other. Robinson et al. (2004) made it clear that minority ethnic individuals, who form small cultural groups, exhibit a high involvement level in contrast with other "local" co-workers. Arvey et al.'s (1989) analysis shows that a person's genetic factor has an effect and impact on contentment, satisfaction, and engagement. They propose and challenge the hypothesis that character behaviors are genetic and can be inherited from generation to the other, hence mediating an apparent degree of satisfaction. Studying and investigating job contentment revealed that while extrinsic gratitude is not genetically related, broad satisfaction is only slightly related to genetics, and intrinsic gratification is considerably correlated to genetics. These discoveries exemplify the significance of externally derived aspects of the manifestation of employee engagement. In conclusion, it is clear that age, character,
specialized career, heredities, and self-ability, are argued to be secondary drivers or shaper factors for driving employee engagement. Chaudhary et al. (2012) stress that the encouraging nature of the work environment, ecosystem, and milieu of an employee can similarly support a safe engagement framework.

1.4 Organizational prime drivers for employee engagement

Most employees' engagement literature studies state that it is the firms' duty to encourage, connect, and exploit the involvement of their personnel (Chaudhary et al., 2012). It is implicit that throughout the practice of multiple schemes, plans, and approaches, firms can increase their employee's level of commitment. Even though Saks (2006) indicates that employee commitment is somehow connected with the worker's individual position performance, it is agreed that the drivers behind a successful employee engagement are a set of structural factors that combined drive engagement. According to Robinson et al. (2004), employee involvement is heavily influenced by a set of organizational factors provided by the firm's management team. The greatest facets of involvement relate to having a sense valuation. These crucial factors that derive from the management operations are listed as: Culture, Line manager role, Recruitment process, and organizational support and resources.

a) Organizational culture

The culture of a company is a central value for an organization so that it leads to the establishment of a suitable environment for involvement to prosper (CIPD, 2012). This company's culture is commonly known to have an impact on an individual performance level, behavior and interaction with co-workers within the workplace (Lok and Crawford, 2004). Moreover, the "philosophical" character of an organizational culture character has an echo on employees' behaviors and fosters standards that are difficult to reproduce and which stipulate an outline of orthodoxy (Torrington et al., 2008). A firm's culture, in other words, is a set of practices, norms, habits, and patterns to which the company personnel, no matter what rank or position, have to adhere to. Culture is an evolving concept that changes over time regarding the company's needs, objectives, mission, vision and external environment.

b) The role of the line manager

In order to improve global performance of the company and their department in specific, managers refer to their resources and assets, especially their team of employees, and make use of them intelligently (Gebauer & Lowman, 2008). Highly inspired, ambitious and encourage employees to engage in their day to day tasks in very innovative and creative ways, leading to the generation of new ideas that may drive the work in easier and more efficient ways (Davenport & Prusak, 2000). The literature findings rouse inquiries such as: the ways managers promote supportive condition that drives creative behaviors and promote employee involvement; and the environments that foster employees to adopt a creative behavior (Sveiby, 1997).

Alfes et al. (2010) promote the idea of line managers and state in her 2010 CIPD report that: "line managers act as the interface between the organization and the
employee, can do much to impact on engagement" (p.3).

Primarily, at a basic level, the studies of Robinson et al. (2004) propose that line managers who look forward and aim to promote and realize an agreeable co-working environment for employee engagement, do:
- Care about their workers and look after them,
- Communicate intensively with their team and involve them in decision making,
- Encourage employees to make use of others co-workers experiences and knowledge as long as the project or task is being developed.

Communication is crucial between employees and line managers and referring to an open communication and co-operation between the different classes of employees within an enjoyable working environment, commitment to success, devotion to improvement, and a set of clear human resources policies are known to please the organization’s responsibility in the employee involvement relationship (Robinson et al., 2004). After the huge role of the HR department in preparing the psychological side of an employee to foster development through employee engagement, it is argued that psychological contracts need to be satisfied by managers’ dedication to their team workers so to stay on the development track and equip them with an appealing work environment to promote development and engagement (Macleod & Clarke, 2009).

Involving managers in the employee engagement process is essential so to offer clarity, gratitude for the employees’ effort and so that workforces and teams feel they are appreciated, well appointed and braced to accomplish their tasks (Macleod & Clarke, 2009).

In conclusion, the majority of scholars approve that the line managers have a critical and decisive responsibility in fastening and fostering employee involvement. Nevertheless, to come in help for these line managers and guide them in this interest, having a person-fit with employees is beneficial to attaching and connecting staff workers and improving the firm’s cultural environment (Woodruffe, 2006).

c) Recruitment process

Because employees are considered by the HRM as a long-term investment, managers should invest in employees through high salaries, trainings, and durable career outlooks while aiming to create an extremely creative and pioneering association (Kochan, 2015).

Because engagement starts at the employment phase (Robinson et al., 2004), Woodruffe (2006) argues that employing the right person at the right position increases the chances of making the engagement happen as soon as possible. This implies that going through an in-depth enrolment procedure that analyzes values and not just knowledge and proficiency, supports ensuring that the fit of the employee and organizational is realized (Kochan, 2015).

d) Organization values, support and job resources
Rich et al. (2010) argue that involvement relies on multiple managerial models so to be done at a professional level. In their study, it is proposed that commitment facilitates interactions between organizational value, managerial support, employee evaluations, task and job conduct and organizational citizenship conduct. Rich et al. (2010) concluded that employees fully emerge themselves in their role within the organization and look forward to boosting the brand image of the organization they represent.

These conclusions contradict the findings of Robinson et al. (2004) who argue at the end of their studies that workers in work-related responsibility are more involved in their task or occupation and not to the organization.

Critics link engagement to job offers and job description, organization resources and assets, employee burnout, and care outcomes (Nahrgang et al., 2011). In their research study, Nahrgang et al. (2011) discovered that an encouraging working environment is optimistically correlated to employee engagement. This innovative work environment is expressed as being communal, well led by competent managers with distinctive capabilities, and a safety aware ambiance.

Firms have a strong power when it comes to employee support (Robinson et al., 2004). Nahrgang et al.'s (2011) analysis demonstrated that the role of organizational encouragement goes further to enclose other organizational factors such as job resources and organizational values that will boost employee engagement. Job resources are a facilitating aspect of realizing employee engagement as proposed by Harter et al. (2002). Moreover, Nahrgang et al. (2011) propose that job resources do actually have an encouraging impact an employee's level of engagement. Job resources can be classified as knowledge material, feedback, autonomy, and supportive advice... Bakker et al. (2007) explore the firms need to provide fitting job resources for their employees. They proved the hypothesis that thankfulness, manager support, organizational environment, and innovativeness can facilitate and drive employee engagement. They argue that employee accessibility to job resources can reduce the effect of negative external dynamics that go outside the firm's scope.

1.5 Outcomes of employee engagement

Employee engagement is widely discussed in the literature as a driver to positive outcomes on both organization and individual level. This Involvement is connected or related to corporate key performance pointers that include bottom line increase, consumer/manager/CEO satisfaction, efficiency, decreased turnover, and a high level of commitment (Soltesz, T. 2016). Harter et al. highlight the significance of commitment and involvement to be done at an individual position so to achieve positive outcomes. In accordance, Kahn (1992) reveals in his works that increased levels of work involvement have shown positive return outcomes at both individual and corporate levels. These outcomes that Kahn (1992) refers to can be classified as “excellence”, “experience” of work, and “well-being” (Alfes et al., 2010) on an individual level, and “efficiency” and “development” on an organizational level. Moreover, Robertson-Smith & Markwick (2009) propose the concept of a connection between employee engagement and customer engagement as one lead to the other. While Harter et al. (2004) and Czarnowsky (2008), validate through research that employee and customer
engagement have positive financial performance outcomes.

The only negative aspect of employee engagement is employee burnout and becoming workaholic (Langelaan et al., 2006). However, firms should understand the limits of employee engagement and should aim to secure a safe environment for its employees (Maslach et al., 2001)
2. Innovation

2.1 What is innovation?

Various definitions of innovation are developed by academics. The innovation concept is commonly assumed as the conception or creation of something “revolutionary” in different topics or fields such as technology, corporate, science, culture, and arts (Oke, 2007).

According to Petrescu, (2017) an innovation is the concept of converting a person’s idea into something useful, such as product, process or service, and that is understood to be an opportunity to bring something new, or add value to existing products (Drucker 1985); while Stern and Deimler (2012) note that innovation is the fastest way and opportunity for a company to grow and gain competitive advantage over competitors.

On the other hand, Burgelmann and Maidique (1996) have a wider view on the innovation topic and argue that an innovation is a result of passing through the different steps of the innovative process. They, later on, define the innovative process as the unity of different activities within the organization that lead to the creation of marketable results.

According to Satell (2016), innovation is the very primary overview of an empirically new service, product or process in the market. Gross (2017) believes that innovation goes beyond resources and includes the time aspect. Time is crucial because it limits the duration of steps to be taken in the innovation process from invention, production, market entry, and expansion.

Looking for innovation from an organizational perspective, scholars agree that it is a team sport. In fact, a firm that relies solely on individual innovators is taking a header. The secret of a healthy innovation scheme is to understand innovation, employees’ capabilities, and the organization as a whole; so to create strong internal capabilities that can compete in a very dynamic work environment (Li, 2016).

Henry and Walker (1991) share an interesting opinion on innovation, stating that innovation is complicated, complex and problematic. Innovators have to think beyond the product and encompass new ways to generate revenues, new interactions and forms of engagement between product, company, and customers. They dispute the idea that innovation is limited to invention because innovation includes multiple other stages from market understanding, financing options and distribution channels.

The following interpretation of innovation by Narvekar and Jain (2006) will be adopted as the complete definition for our studies. They propose that innovation is the system on which firms rely to create new products, systems, and services compulsory to meet the needs of a changing market, adapt to new technologies, and remain aggressive when it comes to competition and rivalry.

The literature review will continue by introducing the function of the R&D department in driving innovation, proceeding with the types and genres of innovation, the components of an innovation capability, and then concluding this part with the innovation process.
2.2 R&D: a driver behind innovation

According to Howkins (2001), 7.3 percent of the world's economy is driven by creative ideas. It accounts for nearly $2,240 billion and is annually increasing by 5 percent so that at present time it accounts for nearly $ 5 billion. Howkins adds that around half of this creative economy is based on Research and development (R&D) and software related activities.

Innovation is being the central attention of all companies and managerial groups. CEOs and business owners add innovation to their priorities but often struggle in applying it wisely (De Bono, 2008). Capon et al. (1992) revealed that expanding and investing in R&D has a positive outcome when it comes to innovation. The majority of the firms at present time relies on the R&D department and describes it as the source of innovative ideas. (De Bono 2008.)

Leifer, (2000) stresses that even though R&D is frequently connected with the innovation of new products, the improvement, and evolution of existing product and services is similarly important due to the advancement of technology and the customer's ever-changing empathy for change. The newly created or improved products should be able to foresee the upcoming desires of today's customers.

Jain et al. (2010) suggest that the R&D department is responsible for three activities:

- Applied research, (get to know new knowledge with a specific goal in mind)
- Basic research, (focused research in a new field, not knowing the real outcome)
- Experimental development (based on previous findings collected through sensible experiences)

The R&D strategy used by an organization can have multiple impacts and outcomes regarding the way it is applied and the factors that govern around. Johansson and Lööf (2008) researched that topic and concluded that:

i) Organizations that are determined by excessively investing on R&D, have better financial outcome than companies that lack R&D.

ii) Irregular or intermittent research for innovation or product development is perceived as having excessive bad financial results in terms of costs.

iii) There should be a linear relationship between the company’s R&D and ability to innovate and turning the conceptual innovation into reality.

2.3 The different types of innovation

The literature specifies that two types of innovations exist: True innovators and minor modifications (O’Conner, 1998; Rice et al., 1998). These two types necessitate diverse core competencies and capabilities to lead a positive outcome (Ottenbacher & Gnoth, 2005).
While true innovations are entirely original concepts, and/or within an absolutely new market, minor modifications are rudimental adjustments and adaptations to new technologies.

Nevertheless, distinguishing innovations based on two categories is relatively inadequate, narrow and insufficient, while at the same time, it does not highlight the indirect important alterations between types of innovations, it does not to clearly illustrate where the originality and innovation lies. Keeley et al. (2013) specify that understanding where to innovate is as crucial as understanding the way to innovate, by identifying the right innovation prospect occasion.

In order to generate an organic sustainable growth in a company, Keeley et al. (2013) proposed ten types of innovation that explore innovation insights and analyze creative archetypes within businesses and activities, so to spot innovation prospects and evaluate the companies' competitive advantage. The proposed innovation type structure is organized into three categories going from left to right: Configuration, Offering, and Experience. Innovations go from the utmost internally engrossed and distant from the product users (backstage), to increasingly pass through innovations that are more ostensible and perceived to customers (onstage). Every category is divided into subcategories that are addressed in the next section.

**Figure 1**: 10 Types of Innovation, retrieved from: *Ten Types of Innovation: The discipline of building breakthrough* Keeley et al., (2013).

### 2.2.2 Configuration

Configuration combines four subclasses of innovation that address the innermost mechanisms of a company and its business and managerial structure.

#### a) Profit model

Inventive profit models discover innovative methods, approaches, and processes to transform a company's offerings and value sources into liquidity. Exceptional profit models or better known as business model patterns (Johnson et al., 2017) mirror the customer's needs and expectations and investigate revenue streams and pricing opportunities. Moreover, it is essential for directors and innovators to grasp the business model pattern they are implementing and how it could give them a competitive advantage over competitors (Johnson et al., 2017). The profit model encompasses multiple concepts from pricing to strategy. Therefore it is crucial to understand the market and the product offered (Lindgren, 2012). An example of innovative business model pattern is Gillette's razor and blade or a printer's ink-jet that relies on selling two mechanically interlinked products distinctly so to increase
revenues and sales. Managers and innovators should always seek to look for what the customer is wishing to pay and how much worth is the product or service worth, thus giving innovators space to introduce price premium and take advantage of the situation (Johnson et al., 2017).

b) Network
The expression "networking" denotes the methodical establishment and management application of domestic and extraneous connections among communities, people, societies, and firms so to increase performance. These connections rely on information exchange, collaboration, and cooperation between different nodes that form a company’s network web (Keeley et al., 2013). Network innovations are based on the concept of taking advantage of other firms' business component from practices, technologies, contributions, distribution channels, and brand image. These innovations mean that a company is exploiting its resources by using others capabilities and resources (Keeley et al., 2013). An example of innovative network is franchising, choosing the suitable associate firm that the company can take advantage of through partnerships or relationships. The networking innovation process is taking huge attention nowadays because companies and organizations are incapable to innovate alone, and with a complex technological working environment, innovations encompass a set of creative firms at the same time” (Borrás & Lundvall, 1997).

c) Structure
Structural innovations emphases the value of systematizing a company's intangible and human assets in an inimitable approach that generates value (Keeley et al., 2013). They are defined as covering new, ground-breaking facets of recognized, ascendancy and configuration relations within an innovation structure (Howells, J. and Edler, 2011), and encompass factors from excellent aptitude management systems, institutional frameworks, governance arrangements, and creative arrangements of wealth equipment; however, they bend to have one shared feature in common: commitment. While Keeley et al., (2013) refer to strategic aspects of structural innovation, the origins of this innovation start in a firms' believe in differentiation. If talent and assets are organized in a structured and regulated way, it becomes extremely hard for competitors to copy (Keeley et al., 2013).

d) Process innovation
Process innovation tackles the firms' core operation or the way they manufacture or create their products and services. Organizations may consider patents, copyrights, and advanced production methodologies, which harvest advantage for years and decades to come, as process innovation. According to Keeley et al., (2013), process innovation is in relationship with the primary activities of Porter's value chain, and more specifically from idea generation to activities, operations to commercialization (Hoyrup et al., 2012). Hullova et al., (2016) argues that process innovations frequently shape the firms’ core competencies that rivals find it complex to replicate.

2.2.3 Offerings
These innovations focus mainly on the firms’ core offerings from products and services.

a) Product Performance
Product performance innovations tackle the worth, quality set, and attributes of a firm’s product. People usually confuse innovation with product performance; however, it is only one of the ten types of innovation proposed by Keeley et al. (2013). This type of innovation is considered as the easiest for competitors to reproduce but allows organizations to keep ahead of competitors on the feature and value level (Keeley et al., 2013). Nevertheless, product performance innovations revolve around the research and development department and are the main drive of an organization for growth; therefore, it has to be used judiciously (Woods, 2015).

According to Friar (1995), excellent product performance does not automatically certify business success. Firms should convince customers about the efficiency and advantages of using effectively these products; therefore, product performance innovation alone may not be sufficient to create significant differentiation. Keeley et al., (2013) define adequate products as being: simplified (ease of use), sustainable (not environmental harmful) and customized (tailored to the customer's needs).

b) Product system
Product system innovations are related to the way products and complementary offerings are linked together, thus forming a strong and scalable offering structure, and adding more value to it. In other words, it reflects the way a firm creates added value by combining multiple products and services from different sources. It is a way of retaining customers over time, as these innovations create a tight connection with the user or customer. A quite common example is the open-source model that relies on decentralization development and inspires open collaboration. Therefore, Product system is encouraged throughout interoperability (the ability of computer systems or software to exchange and make use of information), modularity (the use of individually distinct functional units, as in assembling an electronic or mechanical system), and integration (Keeley et al., 2013).

2.2.4 Experience

These innovations focus essentially on the customer side part of an organization and its business model.

a) Service
Service innovation is based on adding value in the customer's experience from the way the organization supports its potential clients on how you support customers notice the product, understand its value, purchase it, and enjoy its features (Keeley et al., 2013). Service innovations include offering usage improvements, maintenance schemes, customer care, information and customer tutoring (if applicable).

According to Utterback (1994), individuals are frequently the drivers of service innovation, however, its delivery is increasingly demanding automated technologies. It is the noticeable part of the client experience.
b) Channel Innovation
This innovation is exclusively dedicated to the mode offerings that are provided to final users. While it can take multiple channel form from B2B (business to business), B2C (business to clients) or P2P (peer to peer), the channel innovation also encompasses e-commerce, partner or franchise stores. Relying on the Internet to boost the distribution channel is a poster child of channel innovation. It connects long distance customers with product distributors and manufacturers (Alibaba.com).

c) Brand Innovation
Brand innovation is a crucial competence in today’s business. Many firms consider their brand as their core asset; evolving and leveraging this asset in disrupted markets is what they are looking for (Fisk, 2014). Triumph, however, is not limited to brand management, but how to successfully custom and develop the brand to accomplish big steps.
Inventors can brand innovate on multiple levels:
Brand concept level (the reason behind its existence, its identity, how it's noticeable and articulated),
Brand business level (how is it delivered to users, how it can outspread, and what impact it has on society) (Fisk, 2014).
According to Keeley et al. (2013), brands should be agile, approachable and reactive to shifting environments.

d) Customer Engagement Innovation
Fostering persuasive interactions is a poster child for customer engagement innovation. This innovation finds its roots in listening to customer rather than talking to them. (Keeley, 2013).
Sawhney et al., (2005), argues that the Internet has different distinctive capabilities for customer engagement, embracing interactivity, improved range, tenacity, pace, and elasticity. Businesses can make use of these potentials to involve customers in cooperative product innovation through a variety of online-based mechanisms (Online survey, virtual communities, and virtual market testing).

2.3 Innovation categories

Henderson and Clark (1990) highlight the connections between market component and technology knowledge by understanding four categories of innovation. They refer to a two-dimensional matrix. On the X-axis is represented the technology knowledge situation, while on the Y-axis is represented the market component.
a) Incremental Innovation  
Incremental Innovation is the most commonly used form of innovation. It relies on current knowledge, tools, and technology and proposes additional value to the buyer like added features or better design form, within the current market. Incremental innovation is a transformation that depends on a company's proficiency and know-how in module technology within a recognized architecture (Christensen, 1997).

b) Disruptive Innovation  
Disruptive innovation, known as modular innovation, is understood to combine new technologies to a firm’s local and current market. It is stealthy in nature since newer tech will often be inferior to existing market (Basu, 2009). There are a big number of examples when it comes to disruptive innovation in multiple industries such as: Smartphones, hotels and accommodation, taxi services, and security. However, scholars argue that it is not always the first mover into the market who disrupts the industry, but the company that can convince users that the features provided are the best on the market mover who ends up disrupting the existing market (Henderson & Clark, 1990).

c) Architectural Innovation  
This innovation genre is based on applying lessons learned, using acquired skills and technical knowledge within a new market. This innovation is amazing at increasing new customers as long as the new market is receptive (Henderson & Clark, 1990).

d) Radical Innovation  
It is the most challenging form of innovation and is the driver behind new industries (Henderson & Clark, 1990). It is behind the creation of revolutionary technology. Diesel cars were not the first mode of transportation but they were groundbreaking as they indorsed commercialized transportation to go faster and grow. Rothwell and Gardner (1989) advocate that about 10% of innovations are classified as radical since we live in a very technological, scientific and high-tech era.
When talking about a new innovation in a certain sector, it is critical and complex to specify one single category or genre. The innovation genres proposed in this framework are not watertight (Henry & Walker, 1991) because of the overlap and judgment about the genre an innovation should be referenced to.

### 2.4 The four components of an innovation capability

**a) Approach**
The approach is the first line and is understood as the way the work is presented. For instance: a clear definitions of the work schedule and framework of tasks to be accomplished in crafting innovations, the stages, actions, deliverables, and tailor mid activities and methods to be used (Keeley et al., 2013).

**b) Organization**
According to Keeley et al., (2013) the organization is a set of entities that are the basis of innovation capability. These innovation capabilities can be working groups or teams, departments, and leadership, in addition to the link between the firm and the customers or the external environment.

**c) Resources and competencies**
Employees involved in the work of creating and establishing innovation do require a set of skills, training, and a wide range of abilities in analysis, as well as organizational support in providing the best environment and resources to fuel it (Keeley et al., 2013).

**d) Metrics and incentives**
Metrics and incentives are defined by Keeley et al., (2013) as the aims and objectives that guide employees and managers in benchmarking their performance, measuring and evaluating their work/innovation progress, and the intellectual and material motivations that drive a supporting behavior. Moreover, Stern and Deimler (2012) note in their book: “Knowing the average margins and market share isn’t enough; look at the entire range of outcomes—across customers, geographies, products, and the like. This allows you to surface out-of-the-ordinary results for closer inspection.” (p. 178)

### 2.5 Innovation process

The process of creating an innovation is understood as the progress and choice of designs for novelty and the conversion of these thoughts into the innovation (Eveleens, 2017). To highlight the ambiguous character of this process, other scholars use the terminology innovation project. Van der Ven (1999) state that there are many innovative methods currently in use, but they all use in common with others, the same ambition. This determination is to convert a concept in mind to a concrete and real product that fills customers needs. (Zahra & Das, 1993). Scholars developed multiple innovation funnels that have the same concept but differ in the structure of driver and influencer that push the application or the development of an innovation.
Chesbourgh funnel model relies on 4 phases in addition to phase 0: concept evaluation, planning, development, test and evaluation, and product release, while Zandoval Bonazzi, and Zilber's one consists of 3: search, development, and implementation. Concept evaluation is the equivalent of search; where a conceptual idea is investigated, evaluated and studied by experts and people of knowledge within the research and development department. The funnel starts becoming narrower along the innovation phases, allowing the firm to plan the product and evaluate the conceptual innovation by proposing a prototype; this is the first phase of
Chesbrough's model. Later in the future phase, the prototype is developed and proposed as a softly launched product. The soft launch will provide the company with enough time to tests its product or service, its reliability and its interest in the market. Phases 1 to 3 of Chesbrough's model are the equivalent of the development phase of Zandoval Bonazzi, and Zilber. The last phase of both models is the last stage of implementation of an innovation when a product or service is ready to compete or make an effective entry to the market. What is interesting in Zandoval Bonazzi, and Zilber's model is the presence of a marketing/scouting arrow that goes along all stages of innovation process. As it is understood in the OSLO manual (2005), innovation embraces organizational marketing and technology. Losing one of the factors may have very negative impact on the product or service sales image.

As it can be concluded from the innovation funnels, the process starts always with a broad and blurred view coming from the external environment, with a lot of ambiguities and gaps. While the funnel narrows, company should always look if they are going in the right way, should they stop and reconsider some parameters and variables, should they continue, or should they drop the project down? The more a company push along the process, the fewer gaps they have and the more they approach to producing a substantial stable service or product. (Gales & Mansour-Cole 1995.)

However, Andrew and Sirkin (2006) concluded in their research that the process of innovation is in a way complex for organizations because prior going into the process, firms have to comprehend and study external variables that positively affect the process and can the product further, creating a competitive advantage.

2.6 Transition to EDI

The proposed framework on innovation was till now developed at an organizational level; however, the objectives of innovation processes at an employee level are of bigger interest for scholars and researchers due to the interconnection and correlation of different factors that drive employees to innovate. At an individual level, scholars look for factors such as job requirements and responsibilities, abilities, talent sets, involvement in external activities, passion to explore, and knowledge. Consequently, an employee can drive innovation in multiple ways, whether by providing ideas, contributing to the development or add value during the realization. However, it is really interesting to explore cases of employee-driven innovation through all the steps of innovation, from conceptualizing to realizing (Narvekar & Jain, 2006).
3. Employee-driven innovation

3.1 Introduction

Nowadays, we live in a competitive world, where innovation stands out as a crucial instrument for survival and growth in a highly competitive environment in public and private organizations (Høyrup et al., 2012). Inside organizations, a key source for innovation is "Employees" (Sorensen, 2012), they have hidden capabilities for innovation (Ford, 2001; Cohen et al., 1972), which means that they are not exploited as they should be. Employees at all levels of a firm are recognized as "innovation capital" or "innovation assets" (Rumelt and Wernerfelt, 1984), they are an important and effective source of creativity, however, they are usually ignored in innovative approaches. Starting from this argument, it is of interest to look for what type of strategy or methodology can be applied, to potentiate employee's skills to improve results or organization's growth. Introducing Employee-driven Innovation (EDI) is a methodology that takes advantage of employees' spoken and tacit knowledge in the progress of new tools and structures (Sorensen, 2012). EDI approach is a bottom-up process that focuses on innovation directed by the employees' ideas, creativity, competences and problem-solving abilities (Høyrup 2010). In other words, Employee-driven innovation defined by Høyrup (p. 8) is "the generation and implementation of ideas, products, and processes originating from interaction of employees, who are not assigned to this task, without any obligation". This methodology is applied in organizations for the exclusive benefit of the firm and its employees. (Rumelt, 1984; Wernerfelt, 1984).

According to the Kesting, P, and Ulhøi, J. study (2010), there are two key groups of organizational members: managers and employees. Managers are the special agents who have formal authority to make decisions about strategic routine and innovations. On the other side, Employees have no responsibility for decision-making, their fundamental role is to follow instructions and implement management decisions, in charge of various supportive activities. Hence, if manager’s decision-making were perfectly rational, there would be nothing left for employees to contribute. The main objective of employee participation is to minimize the imperfections or deficiencies of management decisions. (Kesting, P, and Ulhøi, J. 2010). The reason why EDI methodology is required for organizations and within its application is to surprisingly improve the company's results. In addition, the research, introduces the concept of EDEI (Buhl, A, et al. 2016), which is the equivalent concept of EDI, but with the incorporation of environmental care. In this methodology, employees are expected to behave in an eco-conscious way.

For employee-driven innovation (EDI) there is an expanding interest, however, there is a lack of empirical studies covering innovation from the employee perspective. (Wihlman, et al., 2014). The past literature centering on EDI is surprisingly rare. It looks that there is no research stream that would exclusively focus on the topic (Axtell et al., 2000; Wihlman et al., 2014). Employee-driven innovation activity is usually seen as part of continuous improvement and total quality management (TQM), but not so much as a driver or a ‘tool’ for coping with continuous change (Lloyd, 1999; Rapp and Eklund, 2002).
3.2 The learning employee-driven innovation process

The Learning Employee Driven Innovation process proposed by Hasu et al. (2014) is designed to enhance innovation analogous education at the workplace among workers and managers on a cooperative and organizational level by offering opportunities and an innovative organized environment where they are able to innovate and practice innovative ideas. The process encloses the following (Hasu et al., 2014 - Høyrup, 2010):

1. Expanding the routine and repetitive work framework.
2. Spontaneous learning throughout continuous involvement
3. Perspective looking and investigating customer understanding behavior
4. Producing and sustaining collective learning

Buhl et al. (2016) argue that the learning EDI process activity is not limited to bottom-up processes that arise far from the superior management teams. In the majority of cases, directors schematize innovation procedures and take decisions on employee ideas so to alleviate the risk of incoordination in the process development. Therefore, a collaborative healthy relationship between management teams and employees is crucial in the employee-driven innovation processes (Kristensen et al., 2010).

3.3 Values created by EDI

In the EDI framework and continuous employee development context, values mean understanding a set of personal attributes that will create success, happiness in working life, create a culture of knowledge, self-development and innovation, and financial growth for the company (Chesbrough 2003). When workers and personnel take part in an administrative decision-making process, they will grow their operating incentive and motivation while at the same time will increase their willingness to invest mental and physical power in the organization so to create "innovation" (Tzu-Shian et al., 2010). However, Stacey (2001) stresses on the fact that innovation is not to be mistaken and considered as creativity that is followed by a process implementation because it is an on-going, multifaceted complex feedback activity.

Kristensen et al. (2010) proposed linked criteria that define the values coming from EDI:
– It should generate value for the business
– It should boost work organization
– It should increase work-life quality for the workers.

Work life quality is defined as a grouping of participation, important and significant support from co-workers and management teams, necessary material as regards major change practices, remuneration, a suitable equilibrium between demands and resources, and rewards (Kristensen 2007).

According to Li (2016) Firms could profit from EDI for multiple purposes:
EDI originally relies on a broad and varied group of facts, information, and material. It is due to the involvement and interaction of subordinate level employees with customers and end-users of the product or service. This domain-specific knowledge is crucial to creating innovative concepts that will echo positive feedback and appreciation from the market. According to Kesting and Ulhøi (2010), EDI is able to add comprehensive, appropriate, and assorted assortment of data to the innovation process.

EDI synchronize assorted skills and the innovation process. This synchronization will generate a wide set of designs and concepts. A big set of philosophies is a prospect driver to remarkably and out of the box viewpoints (Li, 2016).

EDI increases employees' encouragements to dynamically get new set of data and participate more effectively and efficiently in their tasks responsibilities. (Kesting and Ulhøi, 2010).

### 3.4 Flexibility in the context of EDI

De Spiegelaere et al. (2013) found an interesting research gap and investigated the relationship between flexibility and EDI. They found out that not all forms of flexibility could be drivers for the employee involvement in decision making or boosting forward the work. The different types and an analysis are proposed below.

**Functional flexibility:**
- It denotes the degree in which firms can rapidly reassign their workforce in several roles to meet changing demands.
- Having a broad spectrum of skills would enhance creativity, however companies and managers especially should increase the chances for these employees to prove their abilities.
- Job-related variables such as work difficulty, independence, and role opportunities are best associated with employee-driven innovation, thus functional flexibility and EDI are two sides of the same coin.

**Contractual flexibility:**
- It is not the contract form that directly affects EDI, but rather the subjective relation between the manager and employee and the amount of job security that the employee recognizes while doing the work.
- Contractual flexibility is not expected to increase employee innovativeness; on the contrary, results suggest that focusing on contractual flexibility has a negative effect on EDI.

**Financial flexibility:**
- Wage flexibility can have both positive and negative effects depending on multiple intervening variables.
- Specific forms of labor flexibility can seriously undermine EDI.

### 3.4 Innovation increasing potential

Kesting and Ulhøi (2010) found a couple of drivers behind the emergence of EDI. The first is related to the business workplace that is becoming more and more challenging and complex. In developed countries, manual work does not longer exist. Scientific development frequently and constantly changes the limits and norms of substituting human-operated with machine-operated practices (Hull Kristensen 2010), resulting in the increasing demand for employees to prove themselves as an innovator and an important asset in the continuity and prosperity of the company, which lead to the second point. Prospect workers progressively expect to achieve their full potential at their job, in order to test their prominent talents and to be looked at as professional members. This progress process is possibly assumed to be a characteristic of the on-going democratization of the business path (Kesting and Ulhøi, 2010).

3.5 Triggers of innovative and motivational activities

Innovation is the practice of switching an occasion into new concepts and setting them into exercise more usually (Bjornali and Støren, 2012) to guide new or enhanced products and services processes. Some identified important internal aspects that to push innovative behaviors comprise encouraging an innovative culture within groups, teams, and firms. (e.g. Leadership), charming organizational structure system (allowing an improved sharing of information and easier communication), cooperation, external direction concerning clienteles and the presence of innovation intrapreneurs (Bjornali and Støren, 2012 – Buhl et al., 2016).

Manso (2011) proposes that the trigger for innovation within an organization is the motivation; therefore he created a motivational model for innovation. Motivating these employees to develop meaningful innovations involves both directly motivating innovation activities and indirectly handling their challenging execution requirements.

Explicit incentives have been widely studied in the literature and have showed impact on motivating innovation (Li, 2016; Bjornali and Støren, 2012). Incentives in form of bonuses support increased employee creativity and productivity (Kachelmeier et al., 2008).

Scholars have proven through research and studies that suitably proposed incentives are crucial to managing innovation at an individual level (in addition to the HR department) (Li, 2016). When approaching EDI these incentives are diverse in form, from monetary incentives to social, psychological and managerial incentives.

Maslow (1954), on the other hand, believes that each individual behaves within a hierarchy of needs. These requirements are physiological needs (survival), safety and security, social needs, confidence and self-esteem, and self-actualization, as shown in Figure 5.

1) Physiological needs are the rudimentary requirements of a person's
2) Safety and security are related to personal protection and reassurance.
3) Social and interpersonal activities help individual creating a sense of fitting in a society of intercommunicating and interacting people.
4) Self-esteem goes with people’s ambitions to achieve, to create something in the society and to get appraised for what was achieved.
5) Self-actualization is the person’s necessity to reach his full potential at tasks that he can perform and excel at.

![Maslow's Hierarchy of Needs](image)

**Figure 5:** Maslow’s Hierarchy of Needs. Retrieved from: *Motivation and Personality*. Maslow (1954).

Maslow's hierarchy of needs suggests that each inferior level of the pyramid has to be fulfilled prior to the one on the upper position. This implies that employees' motivation increases as the number of needs levels increases. Moreover, the Self-Determination Theory (SDT) assumes that the more psychological needs are fulfilled, the more active they will be, the more involved and motivated to create change in the workplace, leaning toward creativity and innovation (Gagné & Deci, 2005).

According to Maccoby (1995), there are two types of motivation, Intrinsic and Extrinsic. While intrinsic motivation is related to self-satisfaction and self-pride when enjoying accomplishing a work (Self-determination, Self-control, and gratification), extrinsic motivation is performing a task so to achieve external objectives and overcome imposed constraint (expected remuneration, future manager evaluation or feedback…). There is a thin line between the two motivation types because theoretical intrinsic motivation infers working for free, while theoretical extrinsic motivation infers that employees would not be motivated without being remunerated. Therefore, it will be more interesting to look at the motivation factors that drive employee in going above and beyond the given tasks rather than looking at the type of motivation.

### 3.6 Drivers for EDI

The proposed literature and intensive research of the authors led to the following set of EDI key drivers:
- Managers and leaders attitude
- Team culture, spirit, and social environment
- Work process - resource allocation
• Job design
• Corporal environment
• Employee suitability
• Organizational values - culture

a) Managers and leaders attitude

Judge et al. (2001) argue the existence of a strong correlation between an employee's contentment with their line managers and his degree of engagement, motivation, creativity, and performance. Moreover, Andriopoulos (2001) claim that management and team leaders' comportments and conducts do have a noteworthy and sustainable influence their employees’ force. These Leader performances inducing employee creativeness comprise exchanging ideas, information, philosophies, and thoughts, in addition to taking part in target setting, inciting and leading teams find innovative ways of reaching objectives and providing constructive feedback (Judge et al., 2001). Managers should also support employees' decision to develop additional skills and abilities separately from work and to follow studies and educations with the expectation that they will broaden their innovation and vision capabilities and knowledge base, resulting on a positive impact on the work and task outcome (Chesbrough, 2003).

Giving employees feedbacks is also crucial and one of the essential pillars of a healthy employer-employee communication. The more the employer and his team are involved in providing helpful feedback, training, and data for employees, the more they develop skills and come up with creative attitudes. (Keeley et al., 2013). Therefore, managers understand their working environment and organizational culture, so that they can transfer the firm’s vision and communicate properly with their teams (Ahmed, 1998).

b) Team culture, spirit and social environment

Team culture, spirit, and social environment are frequent criterions of behavioral attitudes of an organizational climate. (Isaksen et al., 2001) A relation exists between organizational environment, ethos, and culture to employees' creative attitudes. This culture and organizational believes will define the extent to which employee can measure their risk-taking boundaries, freedom space, team honesty and reliability, and experimentation support (Isaksen et al., 2001).

Firms or organizations looking for innovation and creativity should encourage its employees to take risks, without sternly judge their findings or outcomes in case of a failure. Risk taking could have negative effects, thus the extent to which a company can take risks depends on the industry and on its capabilities (Edmondson & Mogelof, 2006). Failing and learning from failure is essential for the development and success of a product or service, therefore companies should not stop and should be able to face failure, understand the failure and set a strategic plan, model its strategy structure and overcoming failure (Ahmed, 1998).
According to Stanley (2016), co-workers relationship elaboration, affection to colleagues, workplace positive environment and favorable chances for knowledge development and learning windows are crucial for an innovative engagement. Thus, it is essential to note that a job position is a continuous learning position, where employees learn from practices, managers, colleagues, and more essentially from the workspace as a whole.

c) Work process – Resource allocation

Lager (2016) proposes that work process is what defines a company from A to Z. It is its business identity and what defines it. Work processes define, the way a company approaches a work, the way it wants to grow (organically or inorganically), how it responds to competitors, how it markets its products…

Work processes have an impact on the technique and methods used to achieve tasks at work, creatively and innovatively. Additionally, this work process can happen in different sectors within a single organization from work structure, strategy, delivery process, customer support, communication, supply chain and the human resource process, human resource planning (Recruitment, Selecting, Hiring, Training, Induction, Evaluation, Promotion and Layoff), Employee remuneration and Benefits Administration, performance management, employee relations) (Stanley, 2016).

A firm’s main work processes are often related to its core competencies and areas of greatest expertise, to the drivers behind the organization's competitive advantage, and to the business growth factors. In other word, work processes are everything that creates or add value to managers, chief officers, and stakeholders (Lager et al., 2010).

From that perspective, it can be seen that the way the work process is done relies heavily on the resources that a company provides. Accessing a firm's resources can have a huge impact on employee's innovation behaviors. Resources are the catalysts of creativity. These resources include equipment, time, capital, properties, data availability, and connection to powerful and experienced people (Lager et al., 2010). McKinney (2016) state that an innovative firm looking to be dedicated to innovation and a pioneer in its industry has to be fully committed, make use and commit to a baseline of resources on a continuous basis and not when some are available.

Time is a driver for ambitious employees to jot down ideas, think about their development and creative ways and perspectives of breaking tasks down so to innovate in a sustainable way (Amabile & Gryskiewicz, 1987). Firms should urge innovation. The idea of referring to innovation in spare time is driving innovation not to take place. Thinking, processing, experimenting, creating and designing a product or service require time; and the more employees find time, the more focused they are and the more it incites their creative endeavors.

Dedicated capital is essential in creating and transforming employees’ ideas from concept to reality. Thus McKinney (2016) argues that Money is an essential resource
that assists innovation, however, the lack of a team of innovative thinkers who can approach specific support equipment on a regular basis and be fully dedicated for innovation, the investment will either be worthless or simply valueless.

The greatest asset a company can have is its people. They are the brain behind every strategic step taken further in creating innovation. These "brainers" are the top performing personnel of a company, who knows the markets, the customers and have a long experience in the work process. They have been trained to be players who guide creativity and mentor innovators in the progression of their ideas (Ahmed, 1998). An investment of talent is compulsory according to McKinney (2016); it is a motivational factor for employees who look always to work on projects that are of interest to them.

Lager (2010) specifies that being effective (do the right thing) and efficient (do things right) when addressing innovation is a hard process that combines different variables. Therefore companies should take rational decisions on applying the best practices and resources. Moreover, there is a deficiency of practical and robust models for resource allocation, and corporates struggle in finding the optimal configuration to adopt, therefore few companies who clearly understand their values, the market needs and there employees behavior are able to create a competitive advantage and be noticeable in the market. As McKinney (2016) says: an excess of innovation funding or an inappropriate balance of valuable resources would kill the innovation.

d) Job design

Job characteristics are reflected as significant promoter to employee's intrinsic innovation and inventive attitude at the workplace (Amabile & Gryskiewicz, 1987). Scholars found that the psychological attachment of an employee to his/her work status has some repercussion on his/her innovative work behavior (IWB) (Drucker, 1985).

Hackman and Oldham (1976) came up with the Job Characteristics Model (JCM) to understand and study the direct effect of job enrichment on IWB. They found that a job should provide:

- A set of varied tasks, so that employees perform a wide array of duties and responsibilities. Therefore an interesting job incorporate different task activities makes it more enjoyable and challenging for the employee.
- A task identity that reflects an idea of the outcome of a project and where does the job take part in the work process.
- A task significance that reflects the degree to which a job has effect on the society and how it can improve customers' experience. Employees involved in jobs that have perceived impact on others are more expected to experience more involvement in their task work.
- The feedback that directs employees on the best way to perform.
- The autonomy that specifies the degree of freedom and independence from the work schedule, decision making, and work framework (methodology). Scholars recognize job autonomy as an
originator of employee's IWB and creativity (de Spiegelaere et al., 2014)

e) Corporal environment

The physical environment has been recognized as influencer on innovative behaviors. (Amabile et al., 1996; McCoy & Evans, 2002; Vithayathawornwong et al., 2003). As in many professions, the workplace environmental design varies from firm to firm based on its culture, location, and capabilities (Høyrup, 2010).

The corporeal environment can be defined as the combination of interior design components, interior surroundings, and ambient aspects. Harrington (1999) advance that each of these three environmental aspects plays a separate role in the innovation ecosystem.

- Interior design components rely on: equipment, furniture, florae and artistic appealing objects.
- Interior surroundings include the object appearance from volume, color, form, convolution, and material, the disposition of workspaces, leisure and conference areas.
- Ambient aspects combine lighting and brightness, noise and sound distribution, climate conditions and air quality.

Dul et al., (2011) validated through their research that the corporeal environment of a firm is a self-reliant source of innovation and creativity advancement through its impact on psychosocial factors. Nature view, break areas, spatial distribution and ease of access to communication between co-workers are environmental drivers to freedom, and social needs (third in Maslow's pyramid). According to Gallup (2008) constantly adding or changing factors in the firm's working environment manage to support innovative conductive and engaged behaviors.

Stokols et al., (2002) evaluated the connection between psychology and work environment stating that the fewer the environmental distractions, the better and the more creative are the employees. The environmental disturbances are associated with noise, lack of confidentiality and circulation around workspaces.

Dul et al. (2011) suggested that a firm's environment should go with the industry that it operates in. The environment surroundings are usually known to be unfamiliar and complex with plenty of colors, designs, and forms when art is involved. However, in a business or financial environment, it is serenity and clarity that governs, with the most basic design.

f) Employee suitability

Keeley et al., (2013) state that when a company is recruiting, it should not look at getting the highest number of innovative individuals, however, it should have a clear methodology and attitude towards guide these newly hired and synchronize their efforts within team, and use suitable metrics and encouragements to lead them into a creative and innovative process.
However, HR personnel have to look first for the best suitable person able to drive innovation, take a new approach and look at things creatively. Scholars have widely discussed the topic, however, the list of ideas and drivers that define the most suitable employee for an IWB.

Mburugu (2015) believes that innovative employees should be rational and confident risk takers. They should be bold and determined, not afraid of taking a step further and fail. According to him, they should:
- Believe in their abilities.
- Be anxious to explore new ideas
- Believe in the product or service they are developing

It is through determination and willingness to explore new concepts that employees may find a potential value for the company. Therefore, according to Chamorro-Premuzic (2013), hired employees should have an opportunistic mindset that empowers them spotting issues and gaps that the company could take advantage from. Opportunities create the basics of entrepreneurship and creativity, and some individuals are more passionate about spotting opportunities and transforming them into a challenging advantage in their favor. Because finding opportunities are quite complex in nature, Mburugu (2015) advocates that employees should crave for curiosity and persistence. He adds that innovative people have a different perspective when looking at things, and are continuously thinking outside the box. Because of their dissatisfied with a status quo situation, avant-gardists employees are able to positively readdress methods of doing things, and thus creating an impact.

Keeley et al., (2013) state that innovators are self-driven, and enjoy learning from experiences. What they truly aspire for is to create a positive impact on their environment, in their society or to mankind.

g) Organisational values, culture and innovative capabilities

Numerous scholars consider culture as a pillar of organizational innovation. Managers and firms’ leaders look at Google when thinking of cultural integration, and to their innovative philosophical working environment (Keeley et al., 2013). Organizational value and culture have an indirect influence on employee engagement (Shuck & Wallard, 2010), and creative behavior (Amabile & Gryskiewicz, 1987). However, deciding to introduce innovation is not as simple as it sounds; it requires the creation of an environment that boosts creativeness. Organization's culture plays a big role here since it enhances the innovative and creative tendencies of the innovator. Culture generally denotes the philosophies, beliefs, and values of a firm (Ahmed 1998). It is somehow complex and unrealistic to change the culture of a company, especially if it has been in a certain market for a certain time. It has already its own identity, rituals, and values. These firms are encouraged to use an adaptive culture (Ohr, 2016) that promotes risk-taking and experimentation, innovation, decentralized and quick decision-making and the ability to take advantage of opportunities.
3.7 Assumptions that directs EDI

The basic assumption of EDI states that workers have hidden potential of skills for innovation (Ford, 2001). This potential can be seen, documented, and manipulated to the advantage of both the organization and its workers (Kesting and Ulhøi, 2010). Thus, any "regular" employee has the potential of creating a positive innovative impression because of his knowledge, practices and his creative competences. Such approach infers that personnel at all stages and ranks of the company are seen as “innovation assets”.

All innovation categories, whether related to product development, service creation, technology research and market growth or related to radical, incremental, architectural or disruptive innovation, they all can be considered as employee-driven innovation providing that their initiator is an employee and they are in conformity with the previously proposed theory.

3.8 EDI barriers

The research on EDI gives credit to the assumption that every worker has the talent required to be able to innovate, regardless of his job position or educational level (Kristiansen and Bloch-Poulsen, 2010). The context and working environment can create some barriers that limit the efficiency of a potential innovation driven by employees during their work practice (Aaltonen and Hytti, 2014). Examples of these limitations can be:

- Working shift periods (Aaltonen and Hytti, 2014)
- The miscommunication and limited interaction between teams (Aaltonen and Hytti, 2014)
- Arbitrary repartition of work and responsibilities (Aaltonen and Hytti, 2014)
- Organizational structures (Aaltonen and Hytti, 2014)
- Tight deadlines (Li, 2016)
- Nature of the work (Aaltonen and Hytti, 2014)
- Financial issues (Aaltonen and Hytti, 2014)
- Degree of dynamism and changes in the market (Triguero et al., 2013)
- The unwillingness to believe in the innovation potential of all workers. (Hull Kristensen 2010)
- Proliferation of the same ideas (Li, 2016)

3.9 EDI and intrapreneurship

Intrapreneurship is the processes of employees using entrepreneurial conduct within large organizations (Hasu et al., 2011). Thus intrapreneurship is a synonym of employee-driven entrepreneurship and not employee-driven innovation. Employee-driven innovation and intrapreneurship do share some traits in common, as they both involve the improvement of new products or services and their manufacturing procedures (Antoncic & Hisrich, 2003). Both innovation and intrapreneurship
concepts emphasize the importance of employee engagement and novelty. On the other hand, EDI labels inventions that institute restitution inside an existing structural boundary of a given firm. Therefore, employee-driven innovation creativities are generally related to the firm's compelling business strategy (Ginsberg & Hay 1994). Controversially, intrapreneurship goes behind the EDI's boundaries (Ginsberg & Hay 1994). The vital differentiation between both concepts is that intrapreneurship comprises and encourages the conception of innovative and independent sub-units or businesses within or as a subsidiary to the current organization, leading to a potential modification in the strategy, vision, and values of the current firm (Keeley et al., 2013). Therefore, intrapreneurship is a more general concept than EDI, which can be looked at as a division of intrapreneurship.
III. Research methodology

1. Research motivation

Numerous motives directed the authors to choose the employee-driven innovation topic. After having both worked on a project basis within international organizations, they were intrigued by organizations’ culture in managing creativeness, innovation and flexibility, so to sustain organic growth and create an impact on the workforce.

However, based on personal previous contact within the workplace with practitioners, managers and organization leaders, in coordination with a glimpse on the academic side of the topic, the authors discovered a lack of standardized framework that guides innovative companies to walk through consistent creative organizational path. Therefore, understanding the link between a firm's resources and employee-innovation drivers is an interesting area of management development and can potentially have a wide audience due to its implications for employee innovativeness.

Moreover, the authors, who are both entranced and driven to work within an intrapreneurial and entrepreneurial ecosystem, were able to grasp the compulsory theoretical and knowledgeable background that will boost them to be ahead of other employees, develop crucial skills and understand the path to create a personal innovative environment within their work climate. Yet, improving the value of future research within the EDI context from one side, and practically stimulate SMEs (small and medium enterprises) and large organization to start or develop their employee-innovative culture and foster innovation workplaces.

2. Research philosophy

The research philosophy reinforces the study strategy; it regroups the philosophical postulations regarding ontology, epistemology, and axiology of the scholar (Creswell, 2013). According to Eriksson and Kovalainen, (2015) the research philosophy understanding advances the research design, which objects a hypothetical and/or pragmatic contribution (p. 12). The practical considerations: ontological, epistemological and axiological, represent a uniting sight or a theory of an academic (p. 14).

2.1 Ontological considerations

Ontological assumptions define “the science or study of being” (Blaikie, 2010), and it deals with how the world is socially operating (Saunders et al., 2012). There are two ontological standpoints on how social entities are perceived: objectivism and subjectivism.

According to Saunders et al. (2012), objectivism (also known as positivism) portrays the external existing position of social regarding social actors. Likewise, Bryman (2012) proclaims that social occurrences have a subsistence that is objective regarding social actors.
Alternatively, subjectivism (also known as constructionism) recognizes that observations and subsequent actions of social actors are at the base of the social phenomena. A constructionism philosophy relies on representational approach of data collection such as observations and secondary data research (case studies). In this form of research, connotations arise frequently near the end of the study process (Saunders et al., 2012).

For the proposed study, the authors see the employee-driven innovation phenomenon as the outcome of social interacting entities. Employee-driven innovation can be perceived as continuously varying reality molded by the progressing standpoints of its actors (the working network). Therefore, embracing an objectivist viewpoint is misrepresentative, since it underestimates the interactions that form the pillars of EDI.

Because this research relies on investigating the drivers that prompt EDI in a managerial and intrapreneurial context, thus reflecting the employee innovation involvement process in the context of the workplace, the authors consider that adopting a subjectivist position will permit the assimilation of pertinent concepts enabling to deal with and answer the research questions more methodically and meticulously.

2.2 Epistemological Considerations

According to Bryman and Bell (2011), epistemological stance denotes what adequate knowledge is in a research field (p. 15) and in what approach this knowledge can be communicated to others. Saunders et al. (2012) characterize three different main epistemological positions (p. 108): positivism, interpretivism, and realism.

<table>
<thead>
<tr>
<th>Positivism</th>
<th>Interpretivism</th>
<th>Realism</th>
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<tbody>
<tr>
<td>Close to natural science relies on the objective tangible reality and accepts the independence between observations and processes</td>
<td>Iterative method that reflects a deep understanding and reflection upon a contextual framework</td>
<td>Deem objective reality, and sees the reflections of a phenomenon as a way to claim liable conclusions</td>
</tr>
<tr>
<td>Based on pragmatism, where theories are challenged from observation to collecting data in a value-free way and verification</td>
<td>Interpretation of meaning – interaction between the scholar and the study perspective</td>
<td>Stress the causative explanation rather than emphasizing description, through qualitative research.</td>
</tr>
<tr>
<td>It is usually based on a quantitative research method</td>
<td>Sensitivity to a combination of speculative models, theories and perception that guides the study</td>
<td>Is connected to the theory of truth, which suggests that the universe endures, independently of individuals’ perceptions of it</td>
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Table 1: XX Characteristic of main philosophical standpoints (adopted from Wainwright & Forbes, 2000, p. 261)
Concerning this proposed research, an interpretivism stance will be embraced. As the research strive to structure a philosophy in the intrapreneurial area by linking business-environment drivers and employee innovation, thus refining the corporal structure including the manager's role, organizational culture, and value, in addition to the work process, the interpretivist stance fits the best. Furthermore, interpretivism reinforces and defends the perception of both intrapreneurship and entrepreneurship as composite and vigorous research fields affected by the interaction of social actors and interpretation of meanings.

2.3 Axiological Considerations

According to Saunders et al. (2012), Axiology is a part of the philosophy structure that studies “judgments about values” (p. 116). And is involved in evaluating the scholar’s personal value on the different stages of the study process. Axiology is the philosophical study of values. In terms of the research methodology, it informs the reader of any potential biases the researchers bring to the research project (O’Gorman & Maclntosh, 2015). It reflects the work principles, codes, beliefs and morals in terms standards in the study and the researchers’ standpoint to the research aim (Li, 2006). Because this work adapts an interpretivist approach when analyzing the different drivers and the milieu of work at the time of the innovation, it is common for certain bias and value-led decisions to occur. However, it is crucial for the authors to be as objective and neutral as possible. Therefore, acknowledging the existence of certain biases and working on minimizing their impact on the research is must for the authors.

3. Research approach

The use of research approaches so to postulate and identify the rapport between theory and research is crucial to specify the theory aspect (Bryman & Bell, 2011) and echo the intention of data collection within a research design framework (Saunders et al., 2012, p. 124). According to Saunders et al., (2009) scholars can gather information whether to build, shape and construct a theory or test and analyze one. While the former is referred to in academia as inductive approach, the latter is denoted as a deductive approach (p. 124).

Scholars often rely on the deductive approach as a scientific research approach (Bryman & Bell, 2011, p. 23). The deductive approach relies on inferring hypotheses from a presented body of knowledge in the literature, which are subsequently tested so as to acknowledge or refute the hypothetical theories (Ghauri & Groenhaug, 2010, p. 15). The deduction approach starts with an expected pattern that forms a set of broad ideas narrowing it down to precise and detailed assumption. On the other side, the induction approach arises from observations and look forward to identifying a pattern from within, therefore moving from particulars to general (Bryman & Bell, 2011).
Studies relying on an inductive approach are usually intrigued, attracted and captivated by behavioral context of the proceedings (Saunders et al., 2009, p. 126). The approach motivates researchers on studying human interaction with the climate in which they operate. While generally a deductive approach is recognized as correlated with quantitative methodologies, an inductive approach is perceived as related to qualitative methodologies of data sampling and analysis. (Bryman & Bell, 2015), According to Bryman and Bell, (2015), the theory is the result of the study in the inductive approach.

A third approach stance exists in the literature under the name of abductive reasoning, which attempts to overcome the limits of existing approaches (Bryman & Bell, 2015, p. 27). It mainly relies on moving backward and forward between induction and deduction (Morgan, 2007, p. 71), therefore seeking to choose the most suitable and adequate description from a set of challenging explanation.

As stated in the introduction, the thesis objectives are to: Discover the mechanisms, limitations and drivers of the employee engagement concept within organization, while outlining its positive outcomes, understand the innovation concept from a research and development perspective, while outlining its types, categories, process and link to firm’s aiming to gain competitive advantage and finally explore the relationship between employee engagement and innovation, the pillars or EDI. Therefore, develop a framework of the EDI process, values, barriers and triggers in an intrapreneurship context, an emerging area of study that relies on scarce theoretical foundations. Consequently, the aim is to shape a new theory that advances the understanding of the drivers in different context regarding the industry and organizational aspects governing the innovation climate.

With an absenteeism of academic theories, hypotheses or proposals based on the reviewed works, the authors consider that the thesis study should be mainly oriented to use an inductive approach. Therefore, the approach is going from observed aspects, deduced from case studies to generalizations of views and assumptions. Besides, the research is favorably context definite as case studies are set in different industries, within different countries, and different organizational capabilities.

4. Research design process

The aim of the research design is to propose an outline for data collection and analysis processes, thus illuminating the significances of a variety of dimensions within the study process that is, for example in the thesis case, understanding managers’ behaviour in boosting the work process so that it offers more creative environment for employees (Bryman & Bell, 2015, p. 49). The section is formed from two main area of interest: the research strategy and the choice of methodology. On a side note, the authors stress on the homogeneity of the work and its consistency with the principally chosen research philosophy, supported by the research question and purposes (Saunders et al., 2012, p. 161).

The authors designed the following framework so to conduct their research process (Figure 6). The proposed five dimensions will be further developed in the research data methodology, data collection, and analysis sections.
4.1 Research data methodological strategy

Qualitative and base-field case studies form the primary data collection method of the thesis study. According to Ghauri and Gronhaug (2010), case studies are the most suitable approach, when it comes to answering case studies defined by "how" and "why"; moreover, scholars have limited power over events and when the emphasized context is on a real-life phenomenon. Therefore, according to Bryman and Bell (2011) an inductive approach and a subjective ontological viewpoint assorted with an interpretivist epistemological stance, will structure the case study strategy on one side, and will help define factors involved in behavioral aspects of different companies on the other.

The literature defines situations that are the most suitable for case studies:

- Case studies are first of all appropriate when authors need to follow an assumption that that stipulate a particular outcome in specific situations. Therefore, authors will be evaluating their theory and its application to the organization (Yin, 1994).

- Second, case studies are appropriate when scholars want to analyze particular facets of an emerging or rare situation; thus it will allow the researchers to compare and contrast the findings (Ghauri & Gronhaug, 2010).

- The third situation is when scholars research firms that are somehow unique and have not been widely reviewed, in order to learn interesting and exclusive insights that define the company's structure and culture.

**Figure 6: The research design dimensions followed**
A case study can be defined as: “a description of a management situation” (Ghauri and Gronhaug, 2010, p.109). Eisenhardt (1989), on the other side, defines it as "a research strategy that focuses on understanding the dynamics present within a single setting". However, the case study strategy cannot be applied to all types of research studies. Ghauri and Gronhaug (2010) argue that the research question and the research goal and aims are the drivers that choose if a case study is suitable and of interest for the hypothesis development and testing.

4.2 Ethical considerations

Denscombe (2009) clarifies that social researchers must refer to an ethical method when conducting their research. This includes using a moral perspective when scheming and leading the research study. In this manner, the authors act beyond what will construct the best set of data, to also reflect what is morally and legitimately acceptable regarding the ethics of humanity.

Ethical issues surface in all studies and must be methodically addressed and mitigated. The authors of this study were devoted to their professional integrity, reporting manners, involvements, and attitudes with honesty (Denscombe, 2009). Regarding the ethicality of the research findings and conclusions, the authors of this research have identified any possible biases and restrictions of the study, to ensure that the readers are well informed. Moreover, the limitations of this study are clearly stated in an effort to avoid any misunderstanding of the study findings. In this way the readers are advised not to make any general suppositions beyond the setting of the investigation. As the research is investigative, its purposes are to drive future research and not to develop generalizable results.

5. Empirical method

5.1 Data collection preparation

Bonomo (1985), proposes a preparation process that goes through four different stages:

- Drift
- Design
- Prediction
- Disconfirmation

The drift phase happens at the very first step of the study process. At that phase, the authors understand the research field, the concepts behind it, and the terminology in the context of the study. It helped the authors widen their perspective and therefore adapt these perceptions to the research question. The second phase: design, reflects the authors' choice of data collection approach so to clarify the research question. The researchers begin by refining the main research field, so to conceptualize the study problem (Ghauri & Gronhaug, 2010).
At the prediction phase, authors have a decent and consistent knowledge of the factors aspects and dynamics on which information gathered from different cases can be categorized, and can thus continue with the analysis and case composition. At the prediction stage, the writers can predict and formulate some tentative explanations of the findings, therefore, be generating particular generalization of critical circumstances.

The final phase is disconfirmation. It denotes the analysis and examination of previously suggested findings and hypotheses. It covers mainly the generalization of the results.

The EDI data collection preparation followed Bonoma linear process model for case study. As long as the authors were investigating cases, the research question was modeled so to encompass different points of view gathered from the cases.

5.2 Classification and case selection

Ghauri and Gronhaug (2010) suggest that "target groups" should be specified prior starting the investigation. In this study case, the target groups were the industries and companies that are related to manufacturing and technology. Out of these target groups, the authors had to research and select cases or companies that would go along with the study. It is crucial to specify that in the EDI case, what the authors look for is the firms' culture in general and the department's attitude towards its creative employees, therefore studying the behavior of managers and employees within their work environment.

As most scholars may argue, there is no ideal number of cases that should be adopted; it all depends on the answer to the research problem and aims. According to Yin’s design for case studies (1994), the case study design that will be adopted in this research is the multiple cases, embedded. This form will allow the authors to understand the different factors of an employee-driven innovation in different sectors.

The choice of the case studies depends on multiple variables: the types of innovation involves, the category of innovation that governs the case, and the innovation drivers that are referred to. While it may be obvious that it is the combination and mixture of the seven proposed drivers that lead creative employees to innovate, some drivers in peculiar cases do effectively play effective roles.

In order to direct the study in a specific direction, the authors adapted the “product performance” innovation as their main type. Big renowned organizations do not rely on solely one innovation; therefore they use one prime innovation (product performance in the case of this study) and complement this main type of innovation with bolder subordinates dependent types that enable boosting the firm’s strategy faster, more effectively and more sustainably.

From a broad perspective, the cases chosen are all product focused. Where employees do effectively create and innovate features and attributes related to a product. However, the authors searched, scanned and examined different employee-driven innovation cases so to spot other critical types of innovation strategically involved so to support the product performance driving force.

The authors investigated the way firms focus on joining and finding connections within their capabilities so that employees can generate product value for customers.

As discussed in the literature section, the "product development" innovation falls in
the "offering" section, right in the center of the adopted framework. Therefore, the
connection should be linked towards both ends of the framework (configuration and
experience) in order to create an optimal level of sustainable innovation.
Consequently, the authors investigated multiple product performance cases, from
different sources, backgrounds, industries, and contexts. Accordingly, the chosen
cases were the ones that present the broader types of innovative designs, thus creating
a quasi-complete framework. The idea was to identify patterns within different
employee-driven innovation context (industry, period, social environment, technology
advancement, etc.) and identify the drivers that most define the creative product
innovation.
The authors’ set of investigation relied on four EDI cases selected from a list of more
than fifteen.

To sum up, the authors developed a structure, which each case was analyzed
according to the following theory: First, among the ten Types of Innovation (Keeley,
2013), the authors focused in one type of innovation; “Product Performance
Innovation” and after were identifying the associations between the main innovation
with the other types of innovation, in other words, the connections between them in
order to recognize their influences. Second, in the literature, the authors proposed
seven EDI drivers and we identify what drivers the company used to turn into reality
the innovation. Following this structure helped us to organize the information and
proceed with the cross-case analysis efficiently.

5.3 Data analysis

The multiple cases - embedded data collection approach that was adopted in the study
combines various sources of data, an approach that decreases the bias comparing to
the single approaches and increases the overall reliability of the information gathered
and accordingly the study findings.
In order to run over the chosen case studies, a cross-case evaluation is required. It is
effectively a study approach that aims to assemble knowledge from different
particular case studies.
Khan and VanWynsberghe (2017) suggest that gathering case data enables
researchers to gain knowledge on an individual basis, relate and find dissimilarities
between cases. Therefore, scholars can generate new understanding and knowledge.
Relying on a cross-case analysis as a data analysis approach will assist the evaluation
of harmonies and alterations in the procedures, happenings, and practices that form
the basis of case studies (Khan & VanWynsberthe, 2017).
According to Stratton (1969), using a cross-case approach outspreads and increases
the researcher's proficiency, skills, and knowledge far more than by relying on an in-
depth single case approach. The method incites the scholar's creativity and ingenuity,
thus stimulating and inspiring him to question his pre-requisites and revealing new
research scopes, proposing alternative point of views, and generating new concepts.
Moreover, the cross-case approach will empower scholars to outline the grouping of
aspects that underwrite the conclusions and case deductions. It will help in explaining
the differences and similarities between cases, therefore, puzzling exclusive findings,
and enunciating new perceptions and theories from one side, and boosting academics’
abilities to recognize the connections and interactions between cases on the other side.
To sum up, a cross-case data analysis approach associates situations from different situations, backgrounds, or company units, therefore offering opportunities to understand different views from the multiple workplaces and assemble analytical evidence that changes scholars’ perspectives.

The cross-case analysis used in the case of this research study will create a comparative design that will compare the innovative environments of different companies, looking for their creativity window and the way they create a pioneering innovative climate that boosts employees to go above and beyond their work requirements. Different companies have different perspectives on innovation, based on their culture, vision, mission, and aims. Therefore each will have a different innovative standpoint, and the aim of the cross-case approach will be finding common grounds to these different creativities.

The aim of the analysis conducted was to identify first the connection between the cases, based on the independent variable associated. These variables are the ten types of innovation, the employee-driven innovation drivers and the categories of innovation.

Each proposed case would be introduced within its industry context and managerial background, reflecting the employee engagement side within the company.

From an innovation point of study, each case will be analyzed separately using "product performance" as the main type of innovation. Secondary innovation types will be annexed to "product performance" in each case and an analysis and evaluation of each of them will be conducted so to understand the climate that governs the innovation.

The EDI drivers will complement the study and will reflect the product development situation. While there is no strict or direct data or information stating the drivers involved in each study, the proposed drivers are deduced from extensive research conducted by the authors, whether about the industry, product or company itself. After classifying the cases and perceptively and judiciously attributing the proposed variables to each and every one, the authors analyzed the different outcomes of the cases, looking for patterns and similarities, while at the same time understanding the causal factors that create differences (industry, time period, culture…). Finding the links between variables is crucial in a cross-case analysis, and the authors investigated the outcomes and impact of each driver on the product development. The aim was to understand if there are drivers that do have superior effect on EDI while others are just secondary and their impact is somehow limited.

The authors, throughout the case studies, will develop a combined matrix (see Appendix 1) that will exhibit the shared variables with the others (innovation types and EDI drivers). These matrixes will enable the reader to understand the outcomes of the cases and understand the links that do exist between them.

To sum up, the data gathered, and so as to deliver a comprehensible finding of the cases, the authors propose a Heptagon reflecting the seven EDI drivers on its peaks and four different shapes reflecting the impact of each driver within the different case contexts (see Figure 16). An analysis of limitation of the studies and recommendation for future ones is conducted in the conclusion.
IV. Empirical study

Empirical study case overview

For the empirical study was selected 4 different EDI successful cases detailed below (Table 2) from a list of more than fifteen cases found in the research. For the selection the authors considered “Product Performance Innovation” as the main focus of innovation, being one of the 10 types of innovation framework developed by Keeley (et al. 1998).

<table>
<thead>
<tr>
<th>EDI SUCCESSFUL CASES</th>
<th>COMPANY</th>
</tr>
</thead>
<tbody>
<tr>
<td># PRODUCT</td>
<td>COMPANY</td>
</tr>
<tr>
<td>1 POST-IT NOTES</td>
<td>3M</td>
</tr>
<tr>
<td>2 WALKMAN</td>
<td>SONY</td>
</tr>
<tr>
<td>3 IPOD</td>
<td>APPLE</td>
</tr>
<tr>
<td>4 COLOSTOMY BAG</td>
<td>COLOPLAST</td>
</tr>
</tbody>
</table>

Table 2: EDI successful cases

For the analysis of the cases, the authors first explain the industry where belongs the product, and how was the industry before the innovation. Second, the authors described how the innovation came into a reality. And, third, the analysis of each case was developed. The analysis follows the structure mentioned previously considering the 10 types of Innovation, the 7 EDI drivers, and the 4 categories of innovation.

Further, deepening the analysis, regarding the 10 types of innovation framework by Keeley (et al. 1998), the authors recognized the relation with the other types of innovation that are directly linked with the main type of innovation (Product Performance Innovation). After, from the 7 EDI drivers proposed by the authors in the literature were identified the three strongest drivers or at least one that may influence the innovation execution identify, in other words what drivers the organization used to turn the innovation into a reality, to illustrate the impact of the drivers was developed the "Heptagon EDI drivers" (See Figure 16). And finally, was identified the category of the innovation, which is illustrated with a figure in each case (Figures 7, 9, 12, and 14).

For a better understanding the authors summarize each EDI case analysis with a "Poster", which is integrated at the end of each case (Figures 8, 10, 13, and 15). The structure helped the authors to organize the information gathered and proceed with the cross-case analysis in the next chapter. The table below illustrate the structure of the Cases analysis.


<table>
<thead>
<tr>
<th># CASES</th>
<th>PRODUCT</th>
<th>COMPANY</th>
<th>INNOVATIVE EMPLOYEE</th>
<th>EMPIRICAL STUDY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Case #1</td>
<td>POST-IT NOTES</td>
<td>3M</td>
<td>Art Fry</td>
<td>1.1 INDUSTRY</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.2 INNOVATION</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.3 CASE ANALYSIS</td>
</tr>
<tr>
<td>Case #2</td>
<td>WALKMAN</td>
<td>SONY</td>
<td>Kozo Ohsone</td>
<td>2.1 INDUSTRY</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2.2 INNOVATION</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2.3 CASE ANALYSIS</td>
</tr>
<tr>
<td>Case #3</td>
<td>IPOD</td>
<td>APPLE</td>
<td>Tony Fadell</td>
<td>3.1 INDUSTRY</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3.2 INNOVATION</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3.3 CASE ANALYSIS</td>
</tr>
<tr>
<td>Case #4</td>
<td>COLOSTOMY BAG</td>
<td>COLOPLAST</td>
<td>Elise Sørensen</td>
<td>4.1 INDUSTRY</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4.2 INNOVATION</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4.3 CASE ANALYSIS</td>
</tr>
</tbody>
</table>

Table 3: Structure EDI successful EDI Cases

1. Case: Post-it Notes

1.1 Industry

The Post-It Note created by Art Fry in 1974, is a simple product, which its main function is to hold important information that keeps track of simple notes as reminders, lists, ideas, etc. This start product is made-up by a small slip of three by three inch paper with an adhesive band, for its particular components is part of the manufacturing industry. According to the National Aeronautics and Space Administration (NASA, 1996) the Manufacturing Industry in general is the branch of manufacture and trade based on the fabrication, processing, or preparation of products from raw materials. This mainly includes all type of foods, textiles, chemicals machines, equipment, refined metals and minerals derived from extracted ores. As well as all lumber, wood, and pulp products.

To be more specific the Manufacturing Industry is divided into twenty different categories. Being the “Paper and Allied Industry” the category that corresponded directly to the Post-it Notes product. This industry is mainly involved in the manufacture of pulps from wood and other cellulose fibers, such as the manufacture of paper and paperboard. Moreover, the establishments engaged in manufacturing bags of plastics film and sheet, are also included. However, there are some exceptions, for example; the carbon paper, photosensitized paper, blueprint paper and the abrasive paper, that become from stone, clay, glass, neither concrete products.

To produce paper, one of the two main components of wood, lignin, must be removed, this process is generally done by heating with alkalis and bleaching (Kleiner, 2002). The pulp and paper industries are two of the largest in forest products trade. The role of the industry in the sector is getting better, as the forest industries are
inclined to shift from producing raw materials to goods with more value added (Chao, W. and Buongiorno, J. 2012)

However, the pulp and paper Industry has been extremely criticized to damage and destroy forest ecosystems and habitat for various animal species. For that reason, 3M Corporation found a way to avoid this existing barrier, innovating with many different colors and sizes of Post-it Notes produced with paper containing a minimum of 30% postconsumer recycled content. Furthermore, the company offers a 100% eco-friendly option with 100% recycled content notes in canary yellow and some pastel colors. This option is made of 70% pre-consumer and 30% postconsumer fiber. Likewise, the Post-it ¨Easel Pads¨ are similarly produced with 30% postconsumer content paper. This behaviour from the company demonstrates sustainability and compromise with the environment, as an example of an eco-friendly firm.

1.2 Innovation

Minnesota Mining & Manufacturing Co., known as 3M Company, is an American multinational corporation, founded in 1902. The firm was born as a small-scale mining venture, focusing in industrial abrasives and adhesives however it has grown into a global powerhouse whose products help to improve the daily lives of people around the world In 2009, the organization was structured into six different operating business segments: Industrial and Transportation; Health Care; Safety, Security and Protection Services; Consumer and Office; Display and Graphics; and Electro and Communications (Boh, W. Evaristo, R. and Ouderkirk, A. 2013). Today, the company offers over 60,000 products with innovation as a key driver for growth (Boh, W. Evaristo, R. and Ouderkirk, A. 2013). One of the most recognized and successful consumer items at 3M is the well-known brand ¨Post-it Notes¨ developed by employees internally. The three by three-inch self-sticking pieces of yellow notepaper, have become a standard part of the office, showing up in all corners; on desk lamps, computer screens, doors, telephone receivers, memos, windows, fridges, etc.

In 1968, Dr. Spencer Silver, a 3M researcher, was endeavoring to invent a particularly strong adhesive to use in aerospace technology, rather than that, he unintentionally created a light adhesive that stuck to surfaces well but didn't leave an awful residue. After several years of insistence, in 1974, the idea originally began to take shape when Art Fry, another 3M’s corporate scientist, as a part of the choir at North Presbyterian Church was using pieces of scrap paper to mark hymnal responses, for him was a big problem because they constantly fell from the book or slip between pages. In that moment he thought about Spence’s adhesive; a movable, adhesive marker (Fry, 1987).

After a few years of experimentation, testing and refinement of the tiny canary yellow color notepaper, Fry was prepared to present samples of his product inside the organization. At first, was difficult to convince their superiors, the client’s necessity of a sticky note pad that would have a higher price compared to the normal scratch paper. One of the major issues an inventor confronts is describing ideas, concepts and tactile or sensory things that are completely new. He provided the entire organization with the new adhesive notes; colleagues and employees of different departments
loved them. Afterwards, in mid-1980, Silver and Fry’s product debuted in US stores, distributed nationwide (Fry, 1988). Now for over 35 years in the market, Post-it Notes has helped people be more productive, communicate better and express themselves in a number of creative ways (Company webpage).

Art Fry in his speech at the Society for Advancement of Management (SAM) Conference (1987) stated about "Intrapreneurship: there are more ways to be an intrapreneur than an entrepreneur". The main issue for an employee innovating internally is to transmit to the team and supervisors their vision to achieve their objectives. This type of employees are interested in large companies: with a representative capital base, with equipment and technology available, and they like the opportunity to work with people, diverse talents. They are very ambitious; generally, focus on long-term projects, always looking to change things, also curious to learn in consequence to be disruptive. They usually are more motivated to take the chance to make something happen, rather than gain money or power, which are conventional motivations.

3M promote a creative environment? The company believed that innovators are not just found in management (Fry, 1987). Actually, very few breakthroughs come from top-down decisions. Original things require new ways, perspectives, associations, and information that do not always exist in the high levels of the organization. In the case of an established market with an existing technology, Top-down judgments are adequate, for example, the Koreans entering into the existent electronics or automotive markets (Fry, 1987). However, for innovative things usually come from the inside-out, in other words from employees dispersed throughout the whole organization. Furthermore, innovation starts with the initial idea from an individual internally about a new product or service, usually is required more endeavor, creativity, and execution to build the idea into a business; it is a process. Art Fry indicated in his speech that Innovation and Intrapreneuring must be allowed at all the corporate levels (1987). If managers of the company are not innovative or if they not encourage innovation supporting the environment for creativity, then employees have little or zero inspiration and support to develop their ideas.

3M’s organization is integrated by a series of small companies or divisions, each of them sells to specific markets and have their own business plan and profit and loss statements. A division vice president has the equivalent responsibility as a normal CEO in other company. Within the division, employees are very close from either the top or the bottom of the hierarchy. The main objective of this type of structure is to improve communications and the individual activities can have a superior impact on the achievement of division results. Of course, it has an incredible effect on the total success of a project (Fry, 1988). Employees have a responsible feeling and they are empowered by the position; this has a remarkable influence on workers.

At 3M is established a policy which allows employees to spend up to 15 percent of their time on personal projects. Fry to develop the Post-it Note, took advantage this internal company policy. This revolutionary policy was instituted by William McKnight the 3M’s CEO in 1923 and is supported by the company until today. He recognized when employees are interested in the projects they give their best efforts. As a result, the organization had established a corporate culture that encourages innovation (Fry, 1987). This internal atmosphere of creativity in the organization
permitted Art Fry and other employees to learn, develop and grow successfully in the organization. A 3M strength comparing with another firm is that they have been extremely cautious to develop a remarkable habitat for its employees. This made possible for the development of the Post-it Note as a star product.

The motivation for an employee fulfills an important role in the process to achieve their goals. Since Art Fry started to work on the Post-it Notes, he was promoted on three occasions until the present position of corporate scientist, which is the maximum title on the technical side of 3M Corporation. This encourages employees to innovate and grow in the company. In addition, there is an established goal in 3M, that 25 percent of sales should come from new products that did not exist in the last five years (Fry, 1987), this challenge employee’s creativity to develop new products. As a recompense for the extra efforts, employees are soon officially asked to present what they developed and wanted to do. Several of 3M’s new products were developed by employees that gave an extra effort to stand up for something new. Furthermore, to promote competitiveness, 3M award the prize “Golden Step Awards” to the employees that create products that sell $2 million, at a profit, in the first two or three years nationally in the market. In 1981, “Post-It Notes” won a Golden Step Award, and thirteen other products also won the same award. Around the country, just a few products achieve those standards. For example in 1987, 3M had over fifty Golden Step Winners (Fry, 1987).

According to Fry, in an interview for The Journal of Business Strategy (1988) he mentioned, “first, you need a product champion to get that core vision going, then, you need the facilities that the company provides you and a disposition to pull the concept together”. 3M is a company with that capacity, the majority of the technology was already there. 3M is an organization that fosters Employee-driven Innovation, as a result of innovative founders, who hired others like themselves. This particular mentality was transmitted from the very first employee to the most recent; it’s in our company’s genes (Fry, 1987). 3M love to create a product that is easy for the customer to use, but difficult for competitors to make (Fry, 1987). Today, Post-it Notes are available in more than 150 countries and as a Post-it Brand collectively offer more than 4,000 Post-it Products. The technology advances and 3M Company continue to innovate; the Post-it Brand teamed up with Evernote and offers an organizational note-taking app, which can be used in smartphones, laptops, etc. Covering the same functionality of the Post-it Note, but on the web.

1.3 Case Analysis

According to the ten types of innovation framework developed by Keeley (et al. 1998), which the main objective is to analyze and enhance innovation achieved making the process more simple and effective or to examine the current competitors. In order to apply the cases studies selected; Post-it Notes from 3M, Walkman from Sony, iPod from Apple and Plastic Colostomy Bag from Coloplast, following the theory, first we identified what type of innovation was done by the company involving Employee-driven Innovation, after we recognized the relation with other types of innovation that are directly linked with the main type of innovation and at the end we mention the main characteristics of each of them.
10 Types of Innovation

In the case of the remarkable 3M’s product; the “Post-it Note” was developed by an internal employee; Art Fry in 1974. 3M as a recognized organization because of their innovative and creative environment encourages employees to develop new products. The Post-it Note was identified as a “Product Performance” Innovation, this type of innovation mainly give or create value for the company’s products or services. Exist two ways to execute; as a completely new product, as well as an update of existent product contributing significant value to it. Clearly, 3M’s product was a new technology creating a new market for it. This type of innovation is often the easiest for competitors to copy, however, Post-it Notes is one of the Product Performance innovations that deliver long-term competitive advantage, which is the exception of the rule for its incredible performance during the time. Today the Post-it Brand offers overall more than 4,000 products (Company webpage).

Overall the product met the main characteristics of the Product Performance innovation. The Post-it Note is recognized a superior product, it offers to the customer a unique design; a three by three-inch yellow paper high quality with an adhesive strip, where the user can experience its main function. It simplifies and makes easy the consumer’s life, helping them to improve in some way. Also, it is a sustainable product using a 67% plant-based adhesive by weight, helping the wellness of the environment. The product was created and customized to satisfy the user’s necessity, especially people working in offices.

The Post-it is a pioneer product, it was completely new in the market in 1980, nevertheless was challenging for the company to find the way to communicate the product’s functions to the consumer. For that reason, at the beginning, 3M assigned a budget to test the product offering for free samples to the people as a reformulated marketing strategy; this included a brochure within a ten-sheet pad. Fry stated; “We found type of strategy for new things, especially tactile things that require touch, taste, feel, etc”. (1988). In some way, the company had to justify the higher price compared with the normal scratch paper. The link between a new product in the market with a successful marketing campaign, that specifies the usage of the product gives an important role to the first associated innovation named: “Channel”. A “Channel Innovation” is the bridge, which encompasses the connection between the company’s offerings with the clients. E-commerce and different types of physical stores are the main channels for Post-it Notes. They diversify and expand the product into new and different channels. Managers at 3M had the wisdom to manage this connection, where users can buy what they want, with minimal friction and cost and maximum satisfaction from the very beginning. They distributed the required stock of product to the right stores, and today they are able to sell by Internet benefitting from the technology.

In addition, the main innovation is connected with the “Process Innovation” part of the configuration category; this is internally focused on the organization, which involves activities and operations that produce the main offerings making them unique. At 3M is stipulated a user-generated policy connected with EDI that allows employees to invest up to 15 percent of their time on personal projects. This policy foster employees to work in creating and curating the content that powers the company’s products. Fry utilize this EDI’s benefit to developing the Post-it Note. An internal
environment of creativity in the organization endorsed employees to develop successful and innovative products. A remarkable habitat for employees is essential for 3M (Fry, 1987).

When appears a piece of yellow paper stuck somewhere, the first thing that comes to people’s mind is a Post-it Note. The impact of a pioneer product might be stronger compared with other competitor’s products trying to copy. It is linked with the “Brand innovation”, when the name of the brand is well positioned in the market, it is easy to remember and recognize this makes difficult to the consumer to think in another brand. The values of the product are aligned, showing an ambitious idea in a simple piece of paper. It was the result of particular innovative strategies that were implemented, including communications, advertising, service, interactions, channel environments, etc. Moreover, Post-it Notes was a 3M’s brand extension; the firm supported the product since its inception, is an example of many others products under the umbrella of 3M.

The small notepaper from 3M, has become a basic part of the office, appearing everywhere. It is a product that in recognition of its value becomes part of people lives. Furthermore, Post-it Notes has helped users to be more productive, communicate better and express themselves in different ways (Company webpage). It is directly connected to the Customer Engagement innovation, demonstrating simplicity and making life easier for the consumers. The attractive strong yellow color gives personality to the product. Afterwards, 3M rapidly expand their catalog of Post-it Notes offering more colors adapting different customer’s needs. Moreover, the company worked hard to make the customer experience simple, reducing complexity and focus on delivering good quality and functionality.

7 EDI Drivers

The seven key drivers for Employee-driven innovation guide the process of the product development causing a phenomenon in the market. In this analysis, we identified what type of EDI drivers were applied during the process of the product innovation.

Managers and Leaders attitude

“We were blessed with innovative founders, who hired others like themselves” mentioned by Art Fry in a speech given to the 1987 SAM conference. This reflects a strong managerial influence of what the company is looking for. This way of thinking was instilled from the first hired employee to the most recent. Supportive, and always open to new ideas, describe 3M’s leaders, who believe in their employees. The innovative manager's attitude influences the employee's performance, inducing creativeness.

Fry always had support from his lab supervisor, for example, he gave him the permission to charge expenses to the company’s accounts (Fry, 1987). In general, the company encourages innovation investing in employee ideas; it provided Fry with just enough time and money to develop his thoughts. In addition, the system was
supportable enough that things would easily come up in the lab when employees needed. According to Fry (1987), an employee always needs someone in management as a sponsor. If weren't for Geoff Nicholson, his lab director, Bob Molenda, his immediate supervisor and Joe Ramey, his Division Vice President, Post-it Notes never would have emerged from the internal lab. They were very supportive, especially when Fry received disappointing results from an initial market test (Fry, 1987). If managers do not encourage innovation with their example providing a creative and inspirational environment, employees, in consequence, will not be stimulated to innovate.

In 3M divisions, as a particular case, employees are under constant pressure to generate new products, fostering EDI from the managerial personnel, it is an initiative that comes from the company personality. Communication skills among employees and their supervisors are also vital in the process of innovation. It is important for the innovator to be able to transmit a clear message to their team and management.

Work process

The business identity of 3M is innovation, following established rules and policies that made the difference compared with other companies. For example, the internal rule of 25% of sales, it must come from products that did not exist in the last five years (Fry, 1987), this proves employee’s creativity to come up with new products. In addition, in the organization is well-known a policy which permits employees to invest the 15% of their time just in personal projects. Fry utilized this EDI ’s benefit to developing the Post-it Note. These types of initiatives talk about the business personality, which defines the approach of the organization, or strategy that the company uses to grow in the industry, using the “Work Process” EDI’s driver utilized by the company many years ago.

Organizational Values, culture and innovative capabilities

3M since its beginnings have been established an EDI’s driver “Organizational Values, Culture and Innovative Capabilities”, which have an indirect effect on employee engagement (Shuck & Wallard, 2010), and creative behavior (Amabile & Gryskiewicz, 1987). To introduce innovation at 3M, they created an internal environment that boosts creativeness and originality. The Post-it Note product was an example of the strong alignment between employees and the organizational culture, values, and beliefs established. During the process of innovation, employees are confident to take decisions; they try their theories and take advantage of the opportunities presented internally.
4 Categories of Innovation: Radical.

The Post-it Note perfectly describes a "Radical Innovation", being a completely new simple technology in a new market. It was a revolutionary product for its impact on the market and its current daily use in the office, showing up everywhere. Fry had the cunning to connect the client’s necessity with a good quality product, showing simplicity. It was a whole new concept in pressure sensitive adhesives (Fry, 1987). Before the invention, people didn't have the necessity or in some cases, they were using normal scratch paper to leave a note, but it was annoying for them. This proves the tremendous impact of the product in the market.
Figure 8: Post-It Note Poster Summary
2. Case: Walkman

2.1 Industry
The Sony Walkman is part of the electronics industry, which attributes to the organizations that create, design, produce, and sell technological devices. Such as radios, televisions, stereos, computers, etc. From the technological and technical angle, the evolution from portable radio-cassette or car stereo to the Walkman was unimportant. In general, the technology itself was not brand new, opposing to the clear transformation on the practice level, the idea of a portable music player without a recording function was unique (Company webpage).

Sony Walkman was a revolutionary device that accurately changed how people listened to music, the product enabled listeners to take easily their music with them wherever they went (Albright, 2015). In addition, with the first Walkman, and its two-headphone inputs option, the user was able to enjoy music with a friend. As a result, users started to forget the large home record players or inconvenient portable tape decks. The Walkman have changed culture and communication over the last time becoming a symbolic development since the innovative product belongs to a long list of new media; the new technologies of producing, storing and circulating images and sound (Du-Gay et al., 1997, p.17). Today, the user’s majority uses a smartphone to listen to music, thus, it is easy to forget how drastically the Walkman changed things, however, it generated the “mobility” concept, which users were able to take music with them (Reed, 2015). As a result, music consumption became outward-speaking (Klara, 2015).

2.2 Innovation
The Walkman was created by Sony Corporation; the successor of Tokyo Telecommunications Engineering Corporation, founded in 1946 by Akio Morita and Masaru Ibuka. The company started with approximately 20 employees within a short capital. Despite, of all the stories about the Walkman's birth, differed considerably as to the persons involved, the rationales and even the events (Morita, 1986; Klein, 1989; Sony, 1989a; Amanuma, 1990).

The first Sony Walkman emerged in the late 1970’s it revolutionized the way people listen to music. According to New York Times, Kozo Ohson was the "man known within the organization as the father of the Walkman" (Sanger, 1990, p.61). Nevertheless, Ohson himself (Sony, 1989) and former Sony coworker Shu Ueyama both mentioned that the Walkman emerged from a more collective process in which the organization contributed to innovate with ideas for new products (Du-Gay et al., 1997, p.37) through employee-driven innovation. It does not differ too much from the company version, where tells that the Sony’s co-founder Masaru Ibuka was a regular user of the TC-D5; a device; source of high-quality portable music, but without suitable lightweight headphones, and its large size and high price as the major weaknesses. He used to use one for long trips, however, he found it very uncomfortable. He asked Norio Ohga; the executive deputy president for a simplified version of it, approximating to the “Pressman”, the small, monaural tape recorder, but
as a playback-only stereo version (Company webpage). Ohga instantly contacted Kozo Ohsone to work on it.

Sony introduced the first Walkman in 1979 (Sanderson and Uzumeri, 1992). The users loved the product, and it became an icon of cultural freedom and mobility, this also was a result of an exemplary marketing campaign (Smith, 2012). The product was focused on ordinary consumers, rather than professional journalists, who were the main target for portable tape recorders at that time. From this conventional cassette tape recorder, the Walkman was created excluding the record function and speaker, replacing it with stereo circuits and a stereo headphone terminal. It can be mentioned that the Walkman was Sony’s big transformational innovation, the only thing that really put Sony on the map as a radical innovator (Wang, 2015). Many observers contemplate Sony to be one of the most consistent and remarkable innovators of consumer and industrial products (Cope, 1990; Fairhead, 1988; Cianarca et al., 1989; Nozu, 1991; Schlender, 1992). Indoors Sony Corporation, there has been no greater success than the Walkman. Sony has led the personal portable stereo market, worth over $1 billion around the world, for more than ten years has remained the leader, both technically and commercially, despite strong competitors.

Sony's pattern of innovation was well suited to achieve dominance in personal portable stereos (Sanderson, S. and Uzumeri, M., 1995). Product planning, industrial design, product manufacturing engineering and marketing and sales are connected and interact with them, in order to understand customer’s needs. This organizational structure Sony used to generate that pattern of innovation. However, according to Sanderson, S. and Uzumeri, M. (1995) stated that was difficult to understand how the system internally worked, they arrived to the conclusion that Sony innovate and does design in several different ways, depending mainly on the nature of the change (Sanderson, S. and Uzumeri, M., 1995).

The founders wanted to establish an optimal factory emphasizing the spirit of freedom and open-mindedness, in cooperation with technology, will contribute to people’s culture (Sanderson, S. and Uzumeri, M., 1995). This represents Sony's innovative spirit of challenge that motivates to do something that has never been done before. In addition, Masaru Ibuka embraced the spirit of innovation, when he said, "Creativity comes from looking for the unexpected and stepping outside your own experience." The company has always looked forward, designing innovative products for their customers (Sony webpage). The focus of Sony's philosophy was to manage design and manufacturing of products, preparing and planning for future changes and investing in manufacturing systems to simplify the model changeover (Sanderson, S. and Uzumeri, M., 1995). As a result, the company reached to produce every twenty seconds a new Walkman from each production line (Hitakawa, 1988). The objective was to assemble a Walkman fastly, but more important to be capable to change quickly from one design to future models, even considering significant changes.

The Sony’s team has frequently line-up meetings, which are opportunities for EDI; reviewing innovative product ideas that become from employees and evaluate the market situation involving predictions and analysis to understand industrial trends. For example, in the Design department, in order to keep ideas fresh, industrial designers and design engineers are rotated from one product to another (Sanderson, S. and Uzumeri, M., 1995). Furthermore, Sony through the marketing and sales team
collect ideas and keep track of customer needs considering the diverse market regions where the products are sold. From customer inquiry cards, contacts in distribution channels, direct customer surveys as well as sales force meetings with their distribution accounts are some sources where come up new ideas for innovative models (Sanderson, S. and Uzumeri, M., 1995). The marketing and sales department works jointly with industrial design department to create products that address customer needs. Together, they gather information in order to continue with the product planning and engineering. Employees are frequently pushed to innovate and provide new models in order to satisfy particular channels.

**2.3 Case Analysis**

10 Types of Innovation

The walkman was the first portable audio player that surprisingly transformed the way people listen to music. An internal employee Kozo Ohsone through Employee-driven innovation is the creator of the walkman, he was asked by management to develop a portable audio player. Kozo Ohsone and his team were supported by the organization since the beginning to develop new products, in order to satisfy customer’s needs, as a result, they developed the walkman in 1979. Quickly, the innovative portable audio player became a symbol of cultural freedom and mobility, hence in the analysis is identified as a “Product Performance” innovation. Customers were very attracted by the new device; it recognizably was a superior product, demonstrating a new experience to the listener. In addition, Walkman created value to the Sony’s product portfolio, offering a customized item, which fulfilled all the requirements of simplicity, is easy for the user to manage.

Sony by that time was already involved in the music industry producing and selling music through cassettes. In general, the technology was already there, people were buying cassettes to use in their portable radio cassette or car’s stereo. However, the innovative idea of mobility, a product that enabled users to listen to music wherever they want, was a completely a new concept in the market. It was not created as a device to boost music sales, however, in some way Walkman’s sales cooperate the Sony’s music incomes, imposing culture to listen to music through the Walkman. Partly is connected with a Profit Model innovation in the fact of connecting the music market, where Sony was involved and the creation of the Walkman to boost sales. This motivates evolving from driving adoption to extending the product lifecycle (Keeley et al., 2013, p. 20. e.g.: Gillette) Walkman dominated the personal portable stereo market for more than a decade.

The development of the Walkman is also associated with the “Structure” Innovation. Considering the United States and Japan, two distant countries where are established the principal company’s offices, despite the big challenge to connect them and work efficiently, Sony formed a strategic structure to drive innovation, linking different areas with a common objective; to understand customer’s needs. This organizational design enables Sony to align the infrastructure with core qualities and business processes. For instance, they believe in the personnel rotation, in the Design Department employees such as industrial designers and design engineers rotate, from one product to another, in order to conserve ideas fresh. As a post-case example were
the new features added to the first Walkman, satisfying the different type of customer’s needs.

Sony used a variety of outlets, including department stores, mass merchants, and catalogs (Sanderson, S. and Uzumeri, M., 1995). The “Channel” innovation was part of the Walkman; management tactically connected the product with the final user. The big majority is an example of physical stores, where the client has the opportunity to see, touch, and even try the product. Managers had the competence to allocate and diversify Walkman into the right stores, where will be easy for the customer to get a new device. This was linked to an effective marketing campaign, which the objective was to touch customer’s hearts showing life experiences.

The “Brand” innovation was part of the big success of the Walkman, Sony as a well-known internationally brand, helped to connect directly to their customers with the product. However, not everything was a success from the beginning, initially, the product was introduced as “Sound-About” in the U.S. and “Stowaway” in the UK, but with lack of recognition, it was a failure. Afterwards, Sony changed those names and replaced with the new term “Walkman” addressed for all the markets worldwide, it generated a huge impact around the world, the word was easy to remember for the customer and it referred precisely what Sony was trying to communicate. Even the word “Walkman” had entered the Oxford English dictionary for it common use among users. Walkman was a brand extension under the support of Sony Corporation that already was established the brand in the market, representing innovation and technology. Sony believes in a strong emphasis on the quality of the design of their products, which are connected with their values. According to Liz Powell the former Director of Sony Design center, designers are expected to design models that are aligned with the Sony 'look' and consider what the customer really wants to use (Sanderson, S. and Uzumeri, M., 1995). The organization focuses on industrial designers who have capabilities of expressing corporate policy and Sony’s identity through design (Sony, 1989b).

And also is connected with the “Customer Engagement” innovation, the Walkman device understood desires and substantial aspirations of listeners or music fans. Sony offered a new culture, personality, and comfort for the person who purchases a Walkman, in other words, they innovate engaging customers through those strengths. The entire model and its classic blue color gave identity to the product introduced in 1979. Moreover, after the first Walkman, Sony through internal innovation in different departments developed a variety of specific new models of Walkman satisfying needs of different types of customers. Encouraging a good relationship and affection between the customer and the product. For example, the Sports Walkman characterized by a bright yellow waterproof case.

7 EDI Drivers

Managers and Leaders attitude
Starting with the fact that Sony’s co-founder was using products, which his company was producing, gave us an idea of loyalty. Playing the role of customer, as a regular user of TC-D5 devise, Masuru Ibuka came with a brilliant idea in consequence of dissatisfaction with his own product. In that moment he contributed with cleverness for the next remarkable innovation that his company created through EDI in hands of Kozo Ohsone, the general manager of the tape recorder business division.

One of the indispensable pillars of a healthy employer-employee communication is to giving employees feedbacks, for an idea success is fundamental an effective interaction and constructive criticism between them. Sony’s employees received constructive feedback from management and started to work innovating new products, a cause of learned mistakes or weaknesses of previous Sony’s products. When managers and employees share helpful feedback, knowledge, data, and personal experiences between them, they improve personal skills and creativity (Keeley et al., 2013).

Sony used the “Managers and Leader’s attitude” EDI driver at the moment of setting line-up meetings, this is an opportunity for a communicative sessions between management and employees, they can evaluate personal opinions and collected customer’s reviews about an existent products, as well as new ideas for future company’s offerings, giving chance to EDI execution. Here employees learn from the experience and helpful feedback from managers. Furthermore, in order to foster creativity. Sony’s managers decided to rotate personnel from one product to another for the purpose of keep freshness in their ideas (Sanderson, S. and Uzumeri, M., 1995). Many observers have admired the Sony manager’s team, especially its founders, Akio Morita and Masaru Ibuka because of their leadership achievements (Sanderson, S. and Uzumeri, M., 1995). This is an example for all the employees in the organization, which might have a positive influence on their personal leadership skills.

Team culture, spirit and social environment

Kozo Ohsone, known as the Walkman’s father define his product creation as a “collective process”; which a team worked together and contribute to this exceptional innovation. In a big corporation like its Sony, employees have the opportunity to feel a team spirit atmosphere. As consequence of the Sony’s strategic corporative structure between the departments in the company, which connects most of the areas, help to the internal culture and social environment of the company boosting innovation. Co-working affects directly to innovative engagement (Stanley, 2016), which will motivate creativeness for ideas in benefit of the organization. “Team culture, spirit, and social environment” was the second EDI driver used by Sony Corporation for the Walkman creation. The Sony’s internal working environment for its frequent contact and effective communication between employees is helpful to raise innovation. The area such as product planning, industrial design, product manufacturing engineering and marketing and sales are associated and work together for a common objective: satisfy customer’s needs.
Organizational values, culture and innovative capabilities

The leader and managerial Sony’s team showed from its beginnings a mission that encourages, inspires and fulfills curiosity (Sony webpage). Specifically, in the technological sector, they established a company based in a spirit of freedom, giving no chance to limit creativity. To make innovation a reality demands the construction of an environment that encourages creativeness. For Sony Corporation, the EDI driver “Organizational values, culture and innovative capabilities” fulfilled an important role to foster progress and innovate new products. The Sony’s spirit aims to realize something that has never done, which directly is connected with innovation. To satisfy customer needs is the main objective of the organization. It is aligned with Sony’s co-founder philosophy; he mentioned that creativity is about live new experiences that come from unexpected things.

4 Categories of Innovation: Radical

Sony's Walkman illustrates a potential example of a "Radical innovation", which refers to a technological change or technological advances that improve a product, creating a new market. However, the innovator team was based far more on market insights than on technological breakthroughs (Sanderson, S. and Uzumeri, M., 1995). After Walkman, Sony’s next innovation was the double-cassette Walkman, allowing users to put two cassettes in the cassette case and play up to 180 minutes of music, doubling the efficiency compared with the normal Walkman. However, it was an incremental innovation, rather than a disruptive innovation, that would have been the "MP3 player".

Figure 10: Walkman Poster Summary
3. Case: iPod

3.1 Industry

Previously, the idea of portable music concept was already a market reality with the introduction of the Walkman in 1979, however, the iPod following the Walkman’s concept, increased the customer’s comfort with new facilities and improved features. Likewise, Apple’s invention corresponds to the Electronic Industry, offering a superior technological device. The transition from Walkman to iPod was a huge progress in various terms.

The period between 1980’s until the end of 1990’s is considered as the evolution of music technologies (Peng and Sanderson, 2014). The firms, Sony and Philips lead the music industry for almost 20 years, as a result of the creation of the Compact Disc, which they developed cooperatively in 1982. After few years they realized that CD’s sales were decreasing showing in Figure 11, because of two particular product limitations: low recording capability and lack of skipping function. In the late 1980’s, they wanted to address those limitations introducing some new products; Sony presented the MiniDisc and Philips the Digital Compact Cassette. Both didn't succeed showing low impact and unexpected results in the market.

In the technological industry, before the iPod’s conception, MP3 was established as the standard for compressing digital music at the end of 1990’s (Peng and Sanderson, 2014). In Korea were produced the first portable MP3 players by the inventors Kwang-su Moon and Jung-ha Hwang, in 1997. Two Korean companies; Saehan and DigitalCast received separately patent rights from Moon and Hwang (Anonymous, 2006c). Saehan and DigitalCast introduced the “MPMan” and “MPStation” MP3 players. MPMan initiated with the first MP3 hardware players, however the company's efforts didn’t have success. Other technology companies such as Diamond Multimedia, Creative Labs, and Sony introduced their own MP3 players. Later, HanGo and Compaq worked together and announced the PJB-100, in 1999. As well, Creative Labs and Archos presented hard drive MP3 players that year. They were fighting to lead the market of portable MP3 players (Peng and Sanderson, 2014).
However, these types of MP3 players were capable to carry have more storage carrying more music but they have some inconveniences; big size, heavyweight and need a long time to charge. Apple Inc. recognized those competitors' limitations and worked on an MP3 prototype that would solve these problems. As a result, Apple introduced the iPod; it has a small size like a flash memory MP3 players and includes much more storage memory. The difference was enormous, 64MB of an existent MP3 with 5GB of the iPod. Furthermore, the iPod was much lighter and had a higher data transfer rate than all of the other MP3 players in the market at the time (Peng and Sanderson, 2014).

3.2 Innovation

The “iPod” of Apple Inc. was introduced to the market at the end of 2001, this remarkable innovation was a new technology, an exponential improved version of the simultaneous MP3 models that were already existent in the market, but with some limitations. This means that the market by that time was not new, however, the exceptional organizational cooperation of the company made Apple innovate a fantastic disruptive product. Apple Inc. is an American multinational corporation focused in technology, which design, develops, and sells consumer electronics, computer software, online services and personal computers (Cojocaru, C., and Cojocaru, S, 2014). Today, the company has an extensive product portfolio such as iPod, iPhone, iPad, Mac computer, apple watch, Apple TV, etc.

Through EDI, the iPod innovation was in hands of Apple internal employees led by Tony Fadell, however, they never received deserved compliments for the astonishing iPod’s success. Tony Fadell was an independent designer known as “one of the fathers of the iPod”. Previously, he formed his own company called “Fuse” and was trying to sell his MP3 player idea to Sony and Philips, with no success he went to Apple and was hired to lead the development of the original iPod. With that invention, he changed the manner the world uses entertainment. Fadell and his team understood that current users of MP3’s devices wanted simplicity and comfort, they wanted to get their music library into a lightweight portable player quickly and without any difficulty. They were looking for a better customer experience, including more facilities, and improving limitations of actual devices. The iPod's success is undoubtedly due to the satisfaction of customer needs; the combination of its polished and fancy design, its simple way to use, and its easy operative system of find, save, and hear music.

The iPod is a technological device that broke new ground in the existent market of portable MP3 players. Through a marketing campaign, this extraordinary product was strategically thought to launch for Christmas Eve, the best season of the year. Apple started with the first prototype; a classic all-white model of 5 Gigabytes capacity, able to store approximately 1000 songs in MP3 format, with 10 hours battery life. It was part of the first generation of tenth generations created. It charmed new customers in the MP3 category; its unique model with tiny size, great capacity, fast speed file transfer rate and simple of use differentiate the Apple’s device from the competitors (Mick and Fournier, 1998). A strategic strength among Apple's innovation comparing with other MP3 players was its superior portability and memory capacity (Isaacson, 2011: 385). In addition, iPod worked with “Firewire”, guaranteeing fast control and
speed music transfer, this technology was previously developed. And Apple developed an innovative scroll wheel, as the main controller to manipulate music and control easily the device (Isaacson, 2011: 388).

In addition, Apple developed a compatible operating system named iTunes; a digital jukebox software, that permits Mac users to store music in the computer’s hard drive in MP3 format through the process of importing and transforming audio files from CDs. This gave users the chance to transfer their music from a computer to an iPod device through a cable. By that time the software was already working in computers, few months before the iPod release. The only organization to possess the technology; software; iTunes and hardware design capabilities; computer and the iPod, was Apple (Isaacson, 2011, p. 393) with incredible success. This strategic combination gave the Apple’s CEO the credibility to negotiate with music big firms and commercialize single songs, rather than albums. The customer could do it in the Apple's iTunes Store (Isaacson, 2011).

Nevertheless, a sort of customers and industry experts were criticizing iPod’s high price and Windows incompatibility (Anonymous, 2004a; Hiawatha, 2001). At the beginning, Apple ranked fourth in units sold in 2002. Rio, RCA, and Samsung were leading the ranking, however, after Apple face with iPods' Windows incompatibility problem and offered a Windows version of iTunes (Apple Computer Press Release, 2003), in 2003 they reached the first position. After 3 years from its launching, iPod overtakes competitors globally and become the new market leader in portable players. The iPod has changed the way people listened to music. It also contributes and gave a push to the iPhone: the next Apple big innovation. Tony Fadell, the extraordinary Apple employee in 10 years of work developed 18 versions of iPods and the first three versions of the iPhone for the company.

### 3.3 Case Analysis

#### 10 Types of Innovation

Apple Inc. innovated through employee's support and external help coming from Tony Fadell, who was hired by the company to develop particularly the iPod. The company focused on a “Product Performance” Innovation, creating a new product in an existent market. The main factor that transforms iPod device a success, was to reach a competitive advantage over the competitors improving substantially the current weaknesses of existent MP3s, adding functionality and new capabilities. Especially in terms of weight, size, capacity, speed file transfer rate, which involves simplicity and comfort for the customer at the moment of use. This converts iPod to a Superior Product satisfying customer needs, making the experience gratifying. In addition, according to Peng and Sanderson (2014), the innovative design of the original iPod enabled Apple's next models to continue with advances that formed the evolution of the MP3 product classification in general. For example, the incredible scroll wheel controller, a fast adaptive feature included for easy usage operation.

The iPod creation is identified that has a direct link with the “Profit Model” innovation by reason of the connection between iPod and iTunes. iTunes software was active for
customers since 2001, this guided Apple to start with "The iTunes Store", launched in 2003, a virtual music store, which enable customers to buy songs for $0.99 without any obligation to buy the whole artist album, it helped to promote and cooperate iPod device sales (Isaacson, 2011), as well as decreasing illegal downloads and supporting the companies in the music industry (Nash, 2011). Competitors found difficult to copy the intelligent Apple’s strategy, which connects iPod and iTunes to ease the way people listen to portable music, in consequence, some of the companies that had pioneered the MP3 devices were forced to leave the industry.

Apple is characterized by the excellent management skills of its managers, especially when they make decisions and identify opportunities. Apple applied the "Network" innovation, for the iPod birth. It happened when the company identified Fadell’s strength, an expert designer with a huge business vision: “The MP3 player idea”. Apple hired him to develop the iPod, satisfying a common goal; Fadell with lack of resources wanted to make reality his MP3 idea, on the other hand Apple had the capabilities to make it happen. They worked in terms of collaboration, as a team for a mutual benefit; he got the position of vice-president of the iPod division. As a curious fact, Fadell before to present the idea to Apple, he went to Sony and Philips to show his idea, both of them ignored him, those companies didn't have the vision for the future disruptive innovation. Afterwards, Sony turns into an Apple supplier providing approximately 80% of iPod’s technical parts, which were produced by simultaneous companies within the Sony group, for example memory, storage media, etc. (Cojocaru, C and Cojocaru, S, 2014).

The iPod innovation is also connected directly with "Channel" innovation aligned with the company vision. The first Apple Store was founded in mid-2001, before the iPod introduction, for Jobs was fundamental the customer experience as a characteristic of the company. He supported the idea to have a physical space where the customer can have the opportunity to interact with Apple’s offerings. In addition, the iPod was diversified in a list of other stores related with technology, for example, "Best Buy", which was converted as the second authorized reseller of Apple's products. However, the Apple was against channel partners who don't provide the buying experience that the organization expects, demanding high standards to their retailer partners. Furthermore, Apple supported e-commerce channel, by that time they counted with their own online store launched in 1997, where immediately the company uses this facility to sell its iPod devices.

A big part of Apple's success can be recognized to Apple's strong brand reputation (Peng and Sanderson, 2014). The iPod innovation is aligned with "Brand" innovation, making customers recognize the device as part of a well-positioned brand. Apple was already recognized around the world for their particular innovative and creative designs. The logo consists in a bitten apple being one of the most well-known company’s symbol, even more than Google and Coca-Cola, after 40 years from its creation. The iPod innovation expressed strongly the organizational values, being an improved MP3 version that offering entertainment and comfort with superior features. The iPod was one of the most influential Apple’s products (Cojocaru, C and Cojocaru, S, 2014).

Apple worked on "Customer engagement" innovation in the meanwhile they developed the iPod device as a part of the product objective. They understood
customer’s aspirations, simplifying existent MP3 versions. They over-fulfilled user’s expectations adding new features and facilities; they strongly made the difference in comparison with competitors. Apple with an extraordinary design always takes care of small details that customers can live closely, from the product’s package till the effective external advertising. A post-innovation example is illustrated when Apple identified the problem regarding incompatibility between the iPod with Windows system, it was an obstacle for a representative amount of users, and the main reason to don’t purchase the product. They arranged the problem with the creation of iTunes software for Windows in 2003. In this specific case, Apple identifies a particular customer’s need and gave solution reducing user’s complexity. As a result of this strategic decision, Apple became the new market leader of portable players in 2004.

7 EDI Drivers

Managers and leaders attitude

Apple Inc. is a representative organization of technological innovation and management. Without the internal presence of Leader attitude of their management team would be very complicated to achieve remarkable goals as they did. According to the famous author, Brian Merchant "Jobs was a powerful source of inspiration, a fierce curator of good ideas and rejector of bad ones, and a savvy and potent negotiator". Various institutions, organizations and business schools make reference and learn about Apple success from a management perspective. With this model to follow, Apple employees feel engagement for the company they are working for, as well as motivation to improve day by day. Regarding the iPod innovation, manager’s strengths were applied in practice, making the product a reality. The iPod innovation had the support of company’s leaders, making the process easier. In the other hand, considering a top-down point of view, manager’s team lead by Jobs believed in an extensive diversity of talent, and new blood enabled to contribute with new and fresh ideas for innovation.

Even Steve Jobs, one of the most intellectual and influential managers around the world, was looking for skilled people to work on his projects and collaborate him to take the best decisions. Through employee-driven innovation, Jobs in participation with Fadell and his team worked in the iPod development. They knew how to associate with strategic stakeholders that would provide the components and coordinate the innovation processes with them (Nambisan, 2005). Most of the components of the iPod become from a wide international network of companies. For example from Silicon Valley startups came the platform design from PortalPlayer and the operating system from Pixo. The hard disk came partially from Toshiba, the flash memory chip from Sharp Electronics, the planar lithium battery from Sony, etc. (Nambisan, 2005). The network of partners became really important for the iPod innovation, and Jobs and his team had the brilliant competences and skills to deal with it.

Team culture, spirit and social environment

"Diverse teams make innovation possible“ (Company website). Apple believes in "Team culture, spirit and social environment”, an EDI driver that the company applied
during the iPod conception. Tony Fadell known as “one of the fathers of the iPod” worked with an internal team to develop the product. It was challenging for them, however, the positive workplace atmosphere and the relationship with their co-workers helped the team to come with creative ideas and realize the next innovation. Apple Inc. awaits contributions from their diverse and high skilled personnel; they trust and support their people. In addition, Apple encourages employees to take risks and allows them to be whom they are. In case of failure, they support employees and learn from the experience to improve. Failing and learning from mistakes is indispensable for product success (Ahmed, 1998).

Job design

Apple used “Job Design” as Employee-driven Innovation driver. Fadell an independent contractor, was hired by Apple Inc. in 2001, specifically to develop the new MP3: “The iPod”. Between Apple representatives and Fadell defined the job characteristics from the beginning, he knew his mission and responsibilities in the company: to success with his idea that wanted to come true. Before enrolling to Apple, he was trying to sell his idea to Sony and Phillips with no answer. His failures showed his persistence to follow his beliefs. When he got the opportunity in Apple, he showed huge compromise with the organization and came with the iPod invention in the same year that he was hired. In some way, his job characteristics influenced and had repercussion for the iPod innovation. Apple supported giving him autonomy to decide and freedom to come with new ideas.

4 Categories of Innovation: Disruptive

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**Figure 12:** 2x2 Categories of Innovation Matrix. Retrieved from: *The Reconfiguration of Existing Product Technologies and the Failure of Established Firms*. Henderson and Clark (1990)

Taking the previous EDI example of “Sony Walkman”, which in terms of the technological music portable device the MP3 is the next innovation. Theoretically, by
that time Sony Corporation was capable and had all the resources to innovate the portable players new technology and be the new market leader, however, Apple Inc. did it with the iPod, and absolutely disrupt the market (Cojocaru, 2014). The iPod represents a “Disruptive Innovation”; it was a new technology in an existent market. Competitors as Saehan, DigitalCast, Diamond Multimedia, Creative Labs, Sony etc. were already in the market selling MP3 devices, however, after few years Apple in collaboration with Tony Fadell as a senior vice-president of the iPod division and his team disrupt the market with a new technology.

Figure 13: iPod Poster Summary
4. Case: Plastic Colostomy Bags

4.1 Industry

The particular product “Plastic Colostomy Bags” is part of the Pharmaceutical and Medicine Manufacturing Industries, which mainly develops and produces a variety of medicinal and other health-related products that help people from various diseases and allow them to recover. However, the product is made principally of plastic, which is connected directly with the “Plastic Manufactory Industry” for medical equipment. This particular bag is focused on patients diagnosed with colon cancer, especially to use after colostomy operation. Before the 1950s to keep an appropriate sanitation after the surgery was an issue, previously the creation of the Plastic Colostomy Bag, patients were exposed to infections, bad smell, and risk of leaks. As a result, most patients avoid contact with people to prevent any complication.

4.2 Innovation

Elise Sørensen, a recognized Danish nurse that born in 1904, created the first adhesive “Ostomy bag” or “Plastic Colostomy Bag” in 1954. As an employee who worked in the home care sector, as a visiting nurse, she came with a simple solution that made the difference in thousands patient's lives. She was motivated by the dramatic case of her sister Thora, which with just 32 years old was diagnosed with colon cancer, and have to be hospitalized for a colostomy surgery. At that time, with the lack of the Ostomy bag, patients post-operation were exposed for various difficulties such as; inappropriate hygiene using dirty cloth bandages, inadequate protection for any infection, a risk of leaks, and bad smell as an effect of a bad management of the bandages. As a result, a high number of patients tries to avoid social contact in their lives.

In order to help Thora to avoid any inconvenience that could happen after the operation, she developed a technological product that will solve and remedy the actual issues of colostomy patients. She came with the remarkable innovation of a disposable plastic bag with an adhesive capacity to be placed on the body with an enclosed passage from body to bag protecting the patient from dirty linen, smell and leaks (Høyrup et al., 2012, p. 140). Elise designed and patented this fantastic product in collaboration with Aage Louis-Hansen Company; a Danish producer of plastic products led by the owner Aage Louis-Hansen. However, when Sørensen a nurse introduced her idea from her own simple practiced-based experiences, Aage was not interested in the idea. Afterwards, through his wife Johanne Louis-Hansen, a trained nurse who also understood the situation of the patients, convince her husband to support Sørensen’s idea. It was the beginning of the plastic colostomy bags production.

At the beginning the company produced 1,000 bags to introduce the product into the market, it was the first step to a big success. Amusingly, the organization rapidly had complications of lack of stock, they didn't have enough product to complete all the requirements. Then in 1957, after a few years, the new company "Coloplast" was founded focusing just on Sørensen’s idea. Quickly the company became a great export success around the world. Nowadays, Coloplast has more than 7000 employees.
worldwide, they support innovation creating a workplace culture that encourages innovations that emerge from bottom-up processes and are connected to the everyday work practice of the employees, rather than management participation (Høyrup et al., 2012, p. 140).

For Elise, understanding the "work was never just something to be done, but a practice-based experience which built up values, artifacts and emotions of understanding and caring even when disease and symptoms of old age were hard to bear". In general nurses’ ideas are contemplated innovative, they use their practice-based learning experiences about patients’ situations to create new gadgets to solve their patients daily problems adapting their needs. Nevertheless, Elise was never benefited significantly from her explosive development for the society. This is a classic situation of the creative innovative worker who comes up with a creative idea with no organization support its development into an organizational innovation (Høyrup et al., 2012, p. 140).

To illustrate another example where the same company innovated considered nurses’ practice-based experiences is the case of the nurse Tine Ritcher Friis. Her experience as an employee takes places when she realized that as a nurse she was incapable to give a solution for the bedridden patients suffering from the painful pus-filled wounds. In this case, nurses could not help patients because the treatment was too painful. Nurses are the only individuals that can live this type of experiences, which cooperate to their practice-based experience to come with an innovate solution. In collaboration with Coloplast, the nurse Tine came with the idea to produce a plaster with encapsulated painkillers. In this situation, through employee-driven innovation, managers were proud to support and realize employees’ creative ideas, based on their work life experiences (Høyrup et al., 2012, p. 140).

4.3 Case Analysis

10 Types of Innovation

The creation of the “Plastic Colostomy Bag” developed by Elise Soerensen, a home care Danish nurse, is identified as a “Product Performance” innovation. As a new product in the market, it created value for patients replacing an old style and problematic method of using cloth bandages. It represents a Superior Product customized for colon cancer victims, which helped to improve immensely their life’s quality after surgery. She found the way to make the solution stick to patients skin and the plastic bag. With a simple idea that came from Elise’ personal experiences dealing with her patients, it helped to simplify and support the development of healthcare equipment.

The conception of the product to make it a reality is directly connected to the “Network” Innovation. Sørensen looked for a manufacturer that can help to realize her vision. Despite the several rejections that she received at the beginning, most of the plastic manufacturers ignore her, no Danish manufacturer wanted to mature her idea, some of them even laugh out loud about it. However, her insistence on her work and the potential of the idea make one of the manufacturer’s wives herself a trained nurse Johanne, persuades her husband. It opened an opportunity to work with Aage Louis-
Hansen Company that through Johanne believed in Sørensen’s innovation. In collaborative strategy for a mutual benefit, they started to produce the product and distributed to different hospitals.

After Sørensen found a partner manufacturer to produce her product, she found the best way to distribute almost a thousand samples to different hospitals and expand her product to satisfy patient’s needs. The Channel innovation for this type of product took an important role in the process of the success and Sørensen had the certainty to make the connection between the manufacturer and the customer. As a consequence of the great results on sales, ironically they just struggle with shortage problems. After 2 years, two-thirds of the production was for export and the manufacturing of the Aage Louis-Hansen company was only concentrated just in Elise’s idea. That was the main reason to found Coloplast.

The invention has revolutionized the lives of ostomates, satisfying their needs. The product is connected to the Customer Engagement innovation, demonstrating to be simple, disposable and practical. The plastic colostomy bag is a personalized innovation as a result of a practice-based experience which understood and cared about patient’s needs, especially to ease ostomate’s situations. People sent messages to Sørensen, telling her their life has become easier (Company webpage), this represents an example of customer satisfaction, which will make the customer return to buy the product and even more satisfactory, made the customer spread the voice and recommend to more people.

7 EDI Drivers

Job design
Elise Sørensen, a Danish visiting nurse had a strong passion for her job, every day she was traveling from home to home visiting her patients to help them. Sørensen was a recognized devoted person who cares about people and listened to their needs and stories. She was in close contact with her patients and she used the dialogue as a main constructive tool in order to understand and support them. This psychological attachment of Sørensen to her work status has some repercussion on her innovative work behavior (Drucker, 1985). Even more when her sister was detected with colon cancer, where she also became her patient. Her commitment to her job to help people and especially her sister case motivated her to think in an extraordinary product that is able to avoid difficulties and annoying moments after colostomy surgery. This is a successful case of Employee-driven innovation using just Job design as a driver.

4 Categories of Innovation: Radical

Being a clear successful EDI example, which motivated by her younger sister’s hard situation, Sørensen developed a “Radical Innovation” in 1954. Is about the colostomy bag, which is a disposable plastic bag that includes a strong adhesive to be placed directly on body’s patient with an enclosed passage from the body to the bag protecting the patient from dirty linen, smell and leaks (Høyrup et al., 2012, p. 140). By that time this product was a new technology that created its own market. The plastic colostomy bag was a groundbreaking product that satisfied a particular need for a specific target. Before the innovation, patients had to handle uncomfortable issues with traditional cloth bandages.
Figure 15: Colostomy Bag Poster Summary
V. Cross-Case Analysis

1. Categories of innovation
Following the 4 EDI cases previously analyzed, the authors identified strong similarities in the category classification, demonstrating all of the innovations located in the New Technology segment as is showed in Figure 2. The Post-it Note, Walkman, and the Colostomy Bag are categorized as “Radical innovations” they were a new technology and they created their own market because of the inexistence of similar products. They pioneered the product and revolutionized the customer experience. In the other hand, the iPod is also considered as a new technology but is the only product in the analysis not new in the market, because of its existent competitors such as MpMan, MpStation, PJB-100, etc. Fadell, the iPod creator, knew how to take advantage of it and create a ‘Disruptive Innovation’. This gives the study an interesting guideline, where employees feel motivated for new technologies trying to make an impact, however, it's required more information to have a better deduction regarding employee-driven innovation in the 4 categories framework.

2. Industry (Walkman to iPod)
Furthermore, analyzing the industry of the cases selected, the authors identified solid similarities especially in the Walkman and iPod innovation, they come from the same industry of electronics. Being the iPod the precedent of the Walkman, the transition from the Walkman to the iPod was very attractive and showed the vision of both companies in specific periods. Sony through the Walkman innovation led by the employee Kozo Ohsone revolutionized the way people listen music creating a new concept. As a result, Sony has led the personal portable stereo market for more than ten years. But what was the next step? After Walkman, Sony's next innovation was the double-cassette Walkman, allowing users to put two cassettes in the device doubling the efficiency. However, it was an incremental innovation, rather than a disruptive innovation, that would have been the “MP3 player”.

Considering MP3 players technology by that time already exists, companies like Saehan, DigitalCast, Diamon Multimedia, Creative Labs, Sony, etc. developed their MP3 devices. Sony never went forward the MP3 technology, in order to avoid cannibalizing their own music business, they just sat on their technology. In the meanwhile, Tony Fadell developed an MP3 great idea and tried to negotiate with Sony and Phillips, but he never received an answer. After, he went to Apple and was hired to develop his idea: “the iPod”. It was the next generation on the electronics industry that Sony could not see. After few years this remarkable innovation positioned Apple the market leader in portable players, changing the way people listened to music.

3. Product performance
Each case analysis is summarized at the end of each case (Figures 8, 10, 13 and 15) for better understanding. As the authors mentioned before, the 10 types of innovation are categorized into three different fragments: Configuration, Offering, and Experience. For the case selection, the authors focused on the “Offering” section, specifically in the “Product Performance” innovation. According to Keeley (2013),
this type of innovation encompasses exclusively new product as well as updates and line extensions that add important value. In the cases selected: Post-it Note, Walkman, iPod and the Colostomy Bag, were new creations guided by an employee inside the company. The innovations were focused to satisfy customer needs, creating a competitive advantage, in a new market or against existing competitors. This type of innovation is often the easiest for competitors to copy comparing with the other types of innovation, however, the Post-it Note, Walkman, iPod and the Colostomy Bag are products that deliver long-term competitive advantage, which is the exception of the rule. In that case is hard for new entrants to imitate.

All EDI cases selected are concentrated in the creation of a new product rather than an extension of an existent product. This gave the authors a guideline of the employee’s motivation, or their interest when they come with new ideas. All of the cases match to being a superior product, offering a unique design and delivering an exceptional customer experience. These types of products were very attractive and desired by the users, demonstrating customer satisfaction. Furthermore, each innovator test out it performance simplification, in order to reduce complexity for the user, this gives the user a faster adaptation to the product. Nevertheless, is not easy to introduce a new product into the market they had to consider the barriers presented, being conscious that customers are not familiarized with it. For example, before the Walkman, the user didn't know the concept of portable music device, however with its simple and remarkable model the user learned how to manage it without any big effort. Fry, Fadell, Ohsone, and Sørensen through personal experiences and collaboration with their co-workers tried to fit and customize customer’s requirements adding functionality and new capabilities, in order to satisfy their needs. Most of the times they played the customer’s role in order to understand their interaction with the product. For instance, in the case of the iPod, considering that MP3 devices were already in the market, Apple’s team knew the way to achieve important specifications for customer satisfaction through employee creativity. They learned from the competitor’s weaknesses and the iPod was introduced to disrupt the market of MP3s devices. On the contrary, as a part of the Product Performance innovation, the authors found environmental sensitivity only in the 3M case. The company included sustainability in its Post-it Note innovation combining the success of the product with the environment care. Considering that the paper industry is very criticized to damage forest ecosystems and is a risk for various animal species, 3M found the way to use recycled paper and plant-based adhesive in order to collaborate with the environment. This small variance was noticed in comparison with the other 3 cases, showing lack of environmental care for the product production, however, the paper industry might influence 3M to be sustainable for customer’s eyes.

4. Managers and leaders attitude
Big corporations such as 3M, Sony, and Apple are managed by leaders with appropriate capabilities and skills to perform their role. The authors found a high level of satisfaction from the employees regarding how the management team adminstrates their organizations. They are gratified by the support received from managers, this makes them improve day by day. In the case of 3M, Fry stated (1987) that employees are grateful to innovative founders because they hired personnel like themselves. Corporations with this type of managerial attitude help to foster creativity and innovation. Employees of these corporations took advantage of Managers and Leaders
attitude driver to innovate internally. In the analysis, the driver has a strong influence on the employee behavior persuading employees to be creative. Employees feel motivated to come with new ideas inside the organization, rather than being scared of expressing their ideas. Likewise, in Sony Corporation managers formed the line-up meetings, which is an opportunity to share helpful feedback, knowledge and personal experiences between managers and employees. The data analyzed corroborated in most of the cases, that organization’s representatives are admired because of their leadership achievements, it is the case of Steve Jobs; Apple founder, and Akio Morita and Masaru Ibuka; Sony’s founders.

5. Job design driver
However, this doesn't mean that with a lack of leader’s attitude an employee is not able to innovate. That is the case of Sørensen, she didn’t have the managerial support that encourages her to come with her innovative idea. The authors found Job Design driver highly influenced by her innovation. The daily nurse role with frequent close contact with patients and her unpleasant sister’s case inspired Sørensen to come with a solution never tried before. This psychological attachment had repercussion on her innovative work behavior (Drucker, 1985). Moreover, the iPod innovation was influenced also by the Job Design driver, which the Apple manager’s perception collaborated for the recruitment of the iPod’s creator. Fadell was hired with job characteristics very well defined, from the beginning he knew his mission in the company, this helped to focus to develop specifically his innovative idea, working as the vice-president of the iPod division.

6. Network innovation
Furthermore, Fadell, who had two failed attempts with Sony and Phillips trying to develop his idea, after he entered to Apple and took advantage of the network innovation, which influenced to make his idea a reality. As well as the Apple’s management perspective, they recognized the potential of Fadell’s MP3 vision, and hired him. Apple perceived this opportunity, what Sony could not. Fadell in collaboration with Apple worked together for a mutual benefit. The network innovation also occurred in the Plastic Colostomy bag innovation, when Sørensen after several failed attempts, and through her persistence, she found a plastic manufacturer that was able to produce her idea. Both employees relied on themselves, in order to arrive at the connection that helped them to achieve their goals.

7. Experience section
Authors identified substantial concentration in the “experience section” of the 10 types of innovation analysis. These types of innovation are focused on customer-facing elements of an organization and its business system (Keeley, 2013). From four subcategories, the Walkman, iPod and Post-it Note coincide to being influenced by 3 of them: Channel, Brand, and Customer Engagement Innovation. The fourth innovation is Service, which is not related to the cases selected. The authors identified the customer experience important consideration for employee innovation.

During the process of innovation, employees tried to wear customer shoes, in order to understand customer needs. It happened as consequence of their experiences or
scenarios that they lived very close. For example, Art Fry with his experience during
the chorus, or Sørensen experience with her patients, and even the founder of Sony
during his long flights trips without entertainment, collaborating with feedback. The
study shows that employee’s innovations are done to satisfy a personal experience,
they were exploring opportunities creating inexistent products in the market. If the
product is already in the market, innovators look the way to improve that version
focusing on product simplification, in order to reduce complexity for the users, this
was the case of the iPod innovation. In general, this type of products caused customer
engagement, where the user feel identified and benefited with it.

In all the cases selected innovators make sure that the customer can feel the
experience, using Channel innovation as the bridge between the product and the
customer. Managers support physical places where the customer can interact with the
product, or through marketing strategies with free sampling. Furthermore, after the
experience, they are very open for feedback to improve the product as much as they
can. It was the example of the Walkman and iPod device and their improved next
versions refining their limitations through customer and employee opinions.

Just in the case of the Plastic Colostomy Bag, it was influenced by two of those three
innovations mentioned; channel and customer engagement innovations. From the
beginning Sørensen’s innovation didn't have a brand that supports her ideas, however,
to make the product a reality she found the way to conceive her product. While in the
other cases, the product was supported by a recognized brand in the market.

8. Profit model
Furthermore, the authors identified an effect of Profit Model in two specific cases: the
Walkman with the interaction of the music industry where Sony was already selling
music (cassettes) and the iPod with iTunes software that was launched before the
product. The authors perceived that in the technology industry is more prone to occur
this type of innovation. In those cases the innovation was not strategically thought to
boost sales of the music industry (cassettes) for Sony or iTunes music (mp3 songs) for
Apple, however, the introduction of the product collaborate to increase results, which
was a great benefit for the companies.

9. Organizational values, culture and innovative capabilities
The authors observed the “Organizational Values, Culture and Innovative
Capabilities” driver with a high impact on the Post-it Note and Walkman creation.
Behind these products, the companies had strong pillars, which reflect their core
organizational values and culture inside the company. Unconsciously, this structure
already established, support employees to interact with them and come with
innovative ideas. For instance, this is difficult to find in small companies were
internal culture and organizational values are not well structured. It does not mean
that this driver has not influenced the iPod or Colostomy bag creation. It was, but with
lower impact compared with the other EDI drivers.
10. Team culture, spirit and social environment
Moreover, for Walkman and iPod creation was detected the same “Team culture, Spirit and Social Environment” driver with strong influence. The study cases proved teamwork on the product creation, at that point that the inventors recognized their teams as the cause of the innovation success. Nevertheless, behind all of this, important firms foster a good social environment between employees and managers in order to keep people happy for a better overall performance.

11. Work process
The Work Process driver was found in the Post-it Note conception with overwhelming content, 3M Corporation demonstrated with internal policies to be an organization that foster innovation internally. Management gives liberty to employees to use up to 15% of their time in personal projects, helping them to develop personal ideas with the company resources. Furthermore, they are required to sell 25% of their sales goals, emerging from new products launched in the last five years (Fry, 1987). With these policies, the company tries to get the best out of its employees, in some way forcing them to be more creative in their routine. Innovation for 3M’s has a high level of importance this is integrated into employee daily work, fostering them to create new products.

Finally, the authors identified across all the cases studied, the Walkman and iPod devices creations, with the major quantity of coincidences in the 10 types of innovation analysis. Both of them appear in the same industry, this might be the main reason for the strong coincidence of the results. And regarding the 7 EDI drivers proposed for the study; “Managers and Leaders Attitude” was the driver most used in the analysis of all the cases selected. Where in three out of four cases were applied in their performance to help employees to innovate.

For a better understanding, the authors developed the “Heptagon EDI drivers” showed below (Figure 16). The Heptagon illustrated the level of impact of the 7 drivers in each case. It shows how the EDI drivers influence the cases in a scale of 10; giving 10 for the best level of impact and 0 the lower. It is important to mention that the authors gave priority to the three predominant EDI-drivers in the study cases analysis. Furthermore, below is presented a table (X), which demonstrate the evaluation made by the authors, giving the level of influence of the drivers in each case.
Heptagon of EDI Drivers. Cases: Post-it Notes, Walkman, IPod, and Colostomy Bag.

<table>
<thead>
<tr>
<th>PRODUCTS/EDI DRIVERS</th>
<th>POST-IT NOTES</th>
<th>WALKMAN</th>
<th>IPOD</th>
<th>COLOSTOMY BAG</th>
</tr>
</thead>
<tbody>
<tr>
<td>MANAGERS AND LEADERS ATTITUDE</td>
<td>8</td>
<td>4</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>TEAM CULTURE, SPIRIT AND SOCIAL ENVIRONMENT</td>
<td>4</td>
<td>8</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>WORK PROCESS, RESOURCE ALLOCATION</td>
<td>8</td>
<td>4</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>JOB DESIGN</td>
<td>4</td>
<td>4</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>CORPORAL ENVIRONMENT</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>EMPLOYEE SUITABILITY</td>
<td>4</td>
<td>4</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>ORGANIZATIONAL VALUES, CULTURE</td>
<td>8</td>
<td>6</td>
<td>4</td>
<td>2</td>
</tr>
</tbody>
</table>

Table 4: Heptagon EDI drivers evaluation
4. Conclusion and discussion

1. Answering the research question

In the concluding chapter are included all the aspects addressed in the previous sections, it summarizes the discoveries based on the conducted empirical study of Employee Engagement, Innovation, and Employee-driven Innovation. Further, the analysis of 7 drivers applied in four cases studies selected. The thesis study ends by discussing the validity of the EDI-drivers proposed and expanding with more considerations that came out from the cases. In addition, the authors presented the theoretical contributions, limitations of the study, and concludes with recommendations for future studies.

This thesis study was aimed to analyze the context and practice of Employee-driven Innovation in an organization, in order to identify what type of drivers motivates employees to innovate internally. Therefore, the research was guided through literature review and cross-case analysis (VanWynsberghe, R. and Khan, S., 2008). For the study were selected four successful EDI cases followed by the methodology. The authors respected a detailed structure in order to analyze each case individually and after compare them. The derived findings on the case analysis are used to answer the next research question:

What drivers’ match does foster employee-driven innovation within a product performance innovation context?

After analyzed each case study and following a comparison between them by a cross-case analysis, the study found that “There is no perfect combination of EDI drivers in a certain context” or there is no formula to ensure innovation from employees. Even if the innovated product is in the same industry, the drivers might differ caused by many other considerations. For example, the Walkman and iPod innovations (cases 2, 3) both of them belong to the same industry but they didn’t use the same drivers.

Not all the drivers were related with all EDI cases, some of them were more influential than others, and others didn’t even have an effect, (showed in the Figure 16), however, the interaction between them enrich the study opening different types of considerations. In addition, for better understanding the authors in the analysis prioritized the level of impact of the drivers used, selecting the three more influential drivers or at least one. Managers and Leaders attitude was the driver most used in the cases showing a strong influence in the employee behavior, with managerial support, employees felt motivated to come with new ideas. Most of the cases showed admiration to their managers, because of their leadership achievements. This driver persuades employees to be creative and innovate. However, it does not a rule, without a leader’s attitude, an employee is totally able to innovate and it was corroborated by the Elise Sørensen innovation (case 4). Practice-based experiences were proving that employees not necessarily need an admirable manager that motivates them to innovate. In this case, the presence of the Job design driver was clear, the daily routine help employees to understand a special need and come with a solution.
Organizational Values, Culture, and Innovative Capabilities driver were reflected in the cases was an organizational structure was already established (case 1, 2, 3). Big and deep-rooted companies tend to have stronger pillars, with rich culture and organizational values established. This helps employees to have a clear vision of the company objectives and mission of their roles. Hence employees in small companies have more difficulties to innovate. Furthermore, Team culture, Spirit, and Social Environment driver was used in most of the companies, confirming teamwork in the process of the product creation (case 1, 2, 3), the study proved that innovators without the support of their team or network is more difficult to innovate those remarkable products. Moreover, as a part of the Work Process driver, in one company (case 1) were found remarkable policies established these procedures incredibly motivate employees to innovate. It is addressed especially for a continuous improvement, trying to have a competitive advantage over competitors, enabling them to be one step further.

In conclusion, EDI Drivers might change they are not standardized. In the study emerged other considerations to analyze that might depend on the entire context of what the company within a defined industry is looking for. It will depend on different criteria and the cases guided the study to understand these aspects. The authors discovered four main characteristics that might be considered for the success of employees innovating internally. (1) The setting where employees are placed is constantly changed, (2) customer needs, (3) the goals of the company, and (4) the change in technology.

1. The setting where employees are placed is constantly changed.

The environment where employees work is open to constant alteration, every day there are possibilities to an occurrence. Employees are dependent on management decisions that might change in someway employee’s activities or roles. These type alterations have to be considered at the moment to encourage employees to be innovative. Additionally, the study found one company (case 2), which believed in personnel rotation moving employees from one product to another to keep freshness in their ideas, this helped them to foster creativity. This example collaborates for the analysis consideration, trying to understand the continuous change that could happen in an employee position depending on the company strategy.

2. Customer needs

“There is only one boss-the customer. And he can fire everybody in the company from the chairman on down, simply by spending his money somewhere else” (Sam Walton). Companies depend directly on customers and their level of satisfaction during the experience. The study found a link with customer experience focused on customer-facing elements of the company (case 1, 2, 3, 4). Organizations first must understand the customer needs in order to plan their objectives. This type of information can be gathered from wearing customer shoes, trying to understand their issues and desires. In the study was found managers determination to apply strategies in order to make the customer feel the product (case 1, 3); giving free samples or had the physical space where the customer is able to interact with the product. Hence it is important to consider customer needs to foster innovation through employees.
3. The goals of the company.

A clarified organizational structure might influence the employee behavior in order to achieve the company’s objectives. Companies with a clear vision are more capable to define short-term and long-term goals, where employees work in order to follow those goals. In the study was noticed one company, which through policies, they help goals for the next years, forcing employees to innovate (case 1). Before companies were focusing in product innovation, now they are also looking to invest more in different types of innovation, in order to gain competitive advantage, however, it might differ of the company and the industry where is involved. Hence it will depend on the company’s goals to foster innovation internally.

4. The change in technology.

Nowadays we live in a competitive world where the technology change incredibly fast, in the last century the world changed completely in terms of technology, were great innovations came out. Organizations must follow the quick technology pace; otherwise, competitors will take advantage of it, being a threat to the business. Managers and employees in organizations should adapt to this changes to survive in the market. The thesis study illustrated two products in the same industry, where customers changed from one product to another in few years (case 2, 3), highlighting how fast people use and change technologies. Companies are looking forward for the next technologies trusting managers and employees wisdom to make the right choices. Therefore it depends on technology change, how companies react to those alterations and create a competitive advantage against competitors.

Recapitulating the presented findings, this thesis study presented 7 drivers to foster innovation through employees, however, those drivers are not standardized, they do not apply in every scenario, they might change depending on other considerations. Four main characteristics were considered in order to achieve innovation success from employees given the study a wider view.

2. Limitation, reliability and the validity of the study

Qualitative research has been widely judged and considered insufficient by scholars and researchers because it has some limitations while reproducing and generalizing its results in a subjective way (Bryman & Bell, 2011, pp. 408–409). Therefore, in any evaluation of a qualitative research, the concepts of validity and reliability of the findings has to be developed and investigated (Saunders et al., 2009, pp. 156–158).

Validity, from its side, regroups the integrity of deductions and assumptions (Bryman & Bell, 2011, p. 42). Validity denotes the degree of data and information trustworthiness. In this research study, primary data was composed of trusted and reviewed case studies, widely documented and recognized. The authors relied on known products, and commonly used by individuals and practitioners. This primary data collection was complemented and supported by secondary data from papers, web pages, interviews, blogs, speeches and additional qualitative sources. Additionally,
validity denotes the generalization of the findings to further contexts, situations, circumstances, locations, and environments. While the proposed case studies were limited to certain settings, the product in question was widely used products across borders, countries, and continents.

Reliability, on the other side, designates the findings' consistency, uniformity, and steadiness through studies in singular circumstances. Work contrasts enabled critical reviews, especially when talking about the period of innovation. The environmental context that governs the time of innovation, the innovation category, and other shaping facets are crucial and define numerous factors driving employees to create.

The research authors deduced from their structured set of information gained from the literature and the four case studies that they directed, recurring patterns that may shape the drivers within an employee-driven innovation process, but additional acquaintance and participation in different settings of EDI would ensure more insights, so to say that the findings and drawn conclusions are reliable and validate within different contexts. Therefore, a longitudinal research study design would be of great support so to ensure greater insights about the drivers that stimulate employees within different contexts, industries, and environments. This longitudinal study would empower scholars to investigate employee engagement within the evolution process of products and understand the different organizational behavior driving product innovation. The thesis regroups multiple limitations starting from the reliance on one single main type of innovation involved in the case studies (product innovation). Due to the short time frame, the authors conducted a limited study based on product innovation with the combination of other types of innovation. However, it will be interesting and stimulating to discover other, more complex, innovation types that are somehow more challenging for employees to innovate within. Further, the small sample size (four case studies) has limited the number of industries involved in the research and the countries that they take place in. While certainly the culture of people, their mentality, and way of doing things differ from a place to the other, the aim of the case investigations that the authors conducted was to understand the context and the singularities of EDI within that setting.

Moreover, the case studies relied on the authors’ personal interpretation of the innovation context, EDI drivers, and organization milieu. However, the authors believe that it was the most suitable approach for the following research work. The authors narrowed down misinterpretation by repeatedly studying and investigating data related to the same topic from different sources and by examining the information separately.

3. Recommendation for further research and closing observations

When investigating and studying the case studies data, the authors principally focused on the evaluation and analysis of the gained information set and its connection to previously proposed literature study. Nevertheless, in the context of investigating the EDI's drivers and dynamics, the literature around this subject is quite vague and scarce and their limitations are not tested yet. Therefore, this study opens an invitation for further research to dig deeper into evaluating the dynamics behind an employee-
driven innovation context, their limitations, and influence on different types of innovation. As a whole, the authors believe that verifying the projected proposal and support it with a sizable quantitative study would be a proposition for future scholastic studies in order to inspect the generalizability of the research's findings.

Even though the research focus was to match the factors that foster employee-driven innovation and characterize the connection between employee engagement and employee innovative behavior, the researchers found that EDI is not limited to these factors or drivers, but there are a whole study and analysis that goes behind the drivers.

Consequently, this is a point that cannot be neglected or overlooked; the findings emerging from the analysis implied that there are some shapers that do effectively direct and shape the drivers, going from the era of the innovation to the culture of the people and the country, the mentality and the needs of the consumers at the time and finally the goals and aims of companies within industries. Within this competitive era, organizations look to sustain and develop a competitive advantage; therefore, they should look to invest in innovating in different types of innovation that differs from product development. Firms are looking more into their working network, structure, services and brand image while at the same time looking to boost the customer experience. This may be the base of future research that aims to understand how companies are able to direct their employees to look for innovation within these sectors.

To sum up, the findings suggest that the EDI field is a very growing and promising field of study and the authors encourage further studies to be shaped and constructed on this work’s findings by strategically investigating both qualitatively and quantitatively the theory that exists behind employee-driven innovation, thus illustrating the mechanisms within more settings and contexts reflecting more patterns and differences between countries, industries, and company strategies.
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## Appendices

**Appendix 1: 10 Types of Innovation and 7 drivers Table Summary.**

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