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SETTINGS FOR OPEN INNOVATION ARENA: THREE DIMENSIONS TO CONSIDER (CONDITIONS, PROCESS AND RESOURCES)

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SETTINGS FOR OPEN INNOVATION ARENA: THREE DIMENSIONS TO CONSIDER (CONDITIONS, PROCESS AND RESOURCES)

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I would also like to thank The Institute for Systems and Computer Engineering, Technology and Science (INESC TEC) for providing me the opportunity to do my thesis in their institute and the staff for participating in my surveys.

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KEYWORDS

Collaboration, Impact Firm's capacity, Firm boundary, Open innovation, Open innovation Arena.

ABSTRACT

The purpose behind this dissertation is to examine the settings for Open Innovation arena. More particularly the dissertation looks at how a firm can make conditions for taking advantage of outside performers' knowledge at the crossing point of the firm boundary and the outside world, in a composed path by making a physical place that encourages collaboration and permits the firm to use remotely accessible information in a compelling way. Such physical spots mean open Innovation arenas and until now no much studies by researcher and scholars have been carried until now.

The dissertation incorporates open innovation literature that examines the current standings on factors that are considered to impact a firm's capacity to embrace and practice open innovation. It contains literature review and results of a survey conducted among 25 researchers from INESC TEC, the host Institution of the author.

The main results show that INESC TEC promotes innovations and brings together a wide range of conditions that encourage open innovation. The three dimensions considered in this study are near the 75th percentile, which is a good indicator.

The best dimension in INESC TEC seems to be Conditions (77,14%), followed by Resources (71,04%). Processes appears at the end (69,82%). From a more focused perspective, everything indicates that:

- the organization must improve in its innovation strategy as a plan of action with quantitative purposes and targets on long and medium term;
- the organisation must improve its training policy for its staff towards innovation, should have adequate structures for managing knowledge and should also develop the information and communication systems to enable the innovation process;
- the organisation must improve in developing its systematic processes for interdepartmental co-operation.

PALAVRAS CHAVE

Arena de Inovação Aberta, Colaboração, Fronteira, Impacto da Capacidade da Empresa, Inovação aberta.

RESUMO

Esta Dissertação tem como objetivo geral estudar algumas das configurações das Arenas de Inovação Aberta. Em particular, esta Dissertação analisa como é que uma empresa pode criar condições para aproveitar o conhecimento dos atores externos no ponto de interseção entre o limite da empresa e o mundo exterior, através da criação de um lugar físico que incentive a colaboração e permita que a empresa use informação remotamente acessível de forma convincente. Estes pontos físicos, denominados por Arenas de Inovação Abertas têm, até ao momento, sido pouco estudados pelos estudiosos e investigadores.

A Dissertação é composta por uma revisão bibliográfica sobre inovação aberta, examinando os fatores que atualmente são considerados como impactantes na capacidade de uma empresa a abraçar e praticar. Contém revisão de literatura e apresenta resultados de um estudo feito a 25 investigadores do INESC TEC, Instituição de acolhimento do autor.

Os principais resultados mostram que o INESC TEC promove a inovação e junta um conjunto alargado de condições que incentivam a inovação aberta. As três dimensões consideradas na análise estão próximas do percentil 75, o que é um bom indicador.

A melhor dimensão no INESC TEC parece ser as Condições (77,14%), seguida dos Recursos (71,04%). Os Processes aprecem no final (69,82%). Numa perspetiva mais focada, tudo parece indicar que:

- a organização deve melhorar na sua estratégia de inovação através de um plano de ação com fins quantitativos e alvos de médio e longo prazo;
- a organização deve melhorar a sua política de formação em inovação ao staff, deve ter estruturas adequadas para gerir o conhecimento e deve, também, desenvolver os sistemas de informação e comunicação para permitir o processo de inovação;
- a organização deve melhorar o desenvolvimento de seus processos sistemáticos de cooperação interdepartamental.

LIST OF ABBREVIATIONS

COTEC	Business Association for Innovation
IAPMEI	**I**nstitute to support Small and Medium Sized Companies
ICT	**I**nformation and **C**ommunications **T**echnology
INESC TEC	The **I**nstitute for **S**ystems and **C**omputer **E**ngineering, **T**echnology and **S**cience

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1. INTRODUCTION

1 INTRODUCTION

Business success in developed economies and markets depends on the technological progress and on the technological innovation resulting from this same process (Chesbrough,2003). More and more the number of factors that influence the competitive advantage of the enterprises are higher. Companies need to be innovative and have to discover ways to differentiate themselves in the market for which they are segmented.

Innovation can be defined as the process of implementing new ideas to create value for an organization. This may mean creating a new service, system, or process, or enhancing existing ones. Innovation can also take the form of discontinuing an inefficient or out-of-date service, system, or process.

The term innovation is widely accepted by industry and academic professionals as an essential competitive enabler for any enterprise to sustain growth. Innovation is viewed as the main driver for companies to prosper, grow and sustain profile (Hungund and Kiran, 2015). Innovation also plays an important role in the sustainability and the growth of the firm. But still firms are not clear about the type of innovation management practices that need to be adopted for generating an idea and develop a product. A firm need to choose between open and closed innovation practices for its sustainable development.

1.1 Objectives of Dissertation

The main objectives of this Dissertation are the following:

- To do a survey of open innovation literature that examines the current standings on factors that are considered to impact a firm’s capacity to embrace and practice open innovation and what is critical when fitting outside systems
- To understand how a firm can make conditions for taking advantage of outside performers' knowledge at the crossing point of the firm boundary and the outside world in a composed path by making a physical place that encourages collaboration and allows the firm to use remotely accessible information in a compelling way.

- To examine the settings required for open Innovation arena.

1.2 About the Company

The Institute for Systems and Computer Engineering, Technology and Science – INESC TEC is an Associate Laboratory with more than 30 years of experience in R&D and technology transfer. Present in 6 sites in the cities of Porto, Braga and Vila Real, INESC TEC incorporates 13 R&D Centres and one Associate Unit with complementary competences, always looking to the international market.

Figure 1-INESCTEC Logo.

Originating in INESC's pole in Porto, created in May 1985, INESC TEC was the result of a profound restructuring process at INESC, which resulted with the progressive local specialization of its different poles, culminating in the launching of a set of new institutions. INESC has taken the role of a centre of strategic guidance and national consolidation.

INESC Porto, now INESC TEC, was founded on 18 December 1998, with INESC, the University of Porto and the Faculty of Engineering of the University of Porto as its founding associates. In June 2006, the Faculty of Science of the University of Porto and the Polytechnic Institute of Porto also became INESC Porto associates.

INESC Porto was recognised as an Associate Laboratory in 2002. The Ministry of Education and Science Grants Associate Laboratory status to institutions or Units associated with the national science and technology system. These institutions or Units must have earned the classification of Excellent (or Very Good) in international evaluations, they must be strongly committed to improving the quality of science in Portugal, and must play a central role in this process. The FCT - Foundation for Science

and Technology is responsible for administrative relations, public funding, and for evaluating the Associate Laboratories. (INESC TEC,2017)

Figure 2- INESCTEC Porto Building.

In 2011 the institute proposed a new, broader structure for the Associate Laboratory, which was officially recognised by the Ministry of Science as INESC TEC (INESC Technology and Science): INESC TEC (INESC Technology and Science). In May 2015, as part of a change in its Statutes, 'INESC TEC' became the institution's official name.

The University of Porto, INESC and the Polytechnic Institute of Porto are INESC TEC's current associates. The Faculty of Engineering and the Faculty of Science of the University of Porto were independent associates until they were absorbed by the University of Porto when it became a Foundation.

1.3 Methodology

The methodology and the selection of methods were developed around the main aims of the study. There were four main Stages: literature review, interviews, survey and conclusion (see table 1).

Literature Review	This part of the work discusses about the Open Innovation and its activities, the difference between open and closed innovation, Key literature like factors affecting the Open innovation, concepts and practices.
Interviews	This part of the work discusses about the interview conducted among the researchers in INESC TEC. The Interview is based on a questionnaire model developed using "Innovation Scoring"
Results	This part of the work discusses about the results. The results are displayed in a graphical manner and a detailed analysis is done.
Conclusion	This part of the work discusses about the conclusion given and the proposals for future work.

Table 1- Methodology.

1.4 Structure of Dissertation

The structure of the Dissertation can be seen below at table 2.

First Chapter	Deals about the Introduction about the Open Innovation and about the company.
Second Chapter	Deals with the Literature Review where a vast research is made about the Open Innovation arena and its practices.
Third Chapter	Deals with practical work done and the surveys conducted among the employees of INSEC TEC.
Fourth Chapter	Deals with the conclusion, results and future work.
Fifth and sixth Chapter	Contains the references and the questionnaire used for the survey (Annexes)

Table 2- Structure of Dissertation.

2.LITERATURE REVIEW

2 Literature review

2.1 Open Innovation vs Closed Innovation

Open innovation has been proposed as a new paradigm for the management of innovation (Chesbrough, 2003). Chesbrough defined Open innovation as: "A paradigm that assumes that firms can and should use external ideas as well as internal ideas, and internal and external paths to market, as the firms look to advance their technology". Quite the opposite to 'Closed Innovation', which assumed that the best route to innovation was to have control over the process.

The closed innovation paradigm is based on the belief that successful innovation requires control. Companies must generate their own ideas, then develop them, build them, market them, distribute them, service them, finance them, and support them, on their own. Closed innovation counsel's businesses to be self-reliant and internally focused. To be sure of quality, availability, and capability companies have got to do it themselves. Figure 3 shows the closed paradigm for managing industrial R&D, where projects enter on the left at the beginning and proceed through within the firm till they are shipped to customers on the right side.

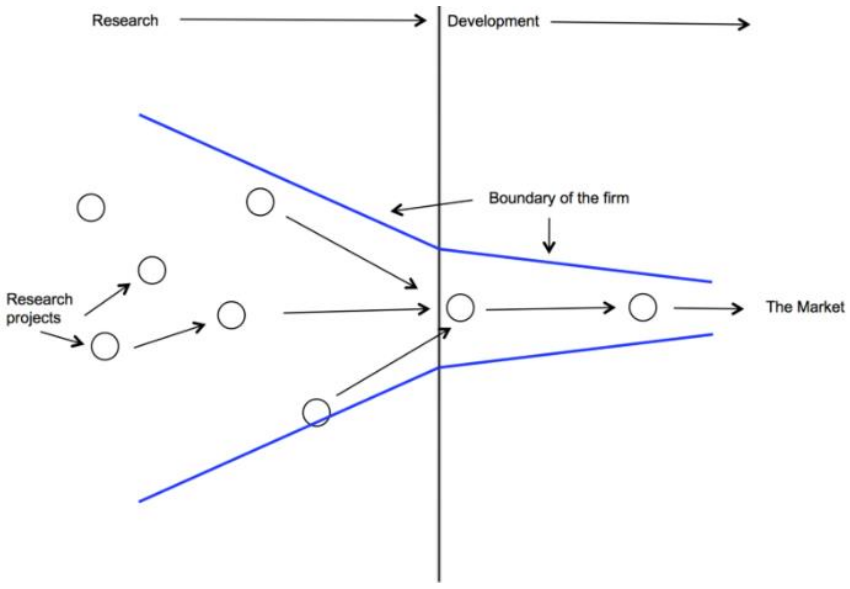

Figure 3- Closed Innovation Paradigm for Managing Industrial R&D (Chesbrough 2006).

By contrast the open innovation paradigm assumes that businesses can and should use external ideas as well as internal ideas, and internal and external paths to market. Doing companies all by themselves, they fail to productively make use of new knowledge and

ideas outside their business. Open innovation combines both external and internal ideas to create value. In addition, ideas can be taken to market through external channels, outside the current business of the firm, to generate additional value, as we can see on Figure 4.

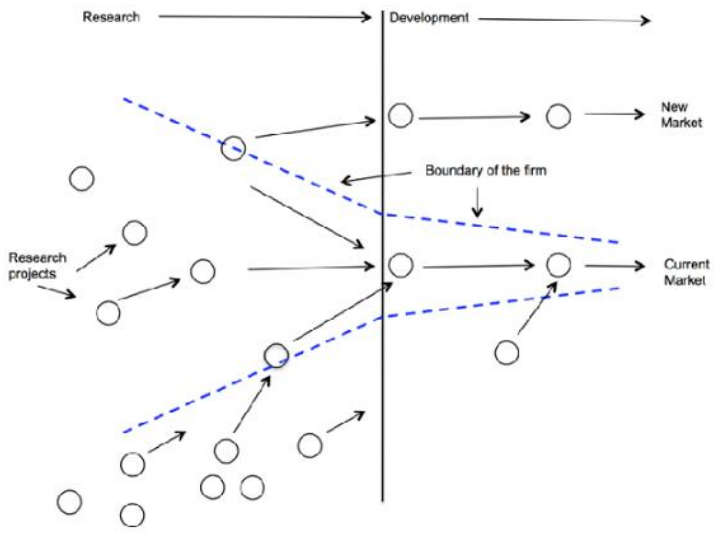

Figure 4-Open Innovation Paradigm for Managing Industrial R&D (Chesbrough 2006).

In fact, open innovation is much broader and enables organisation to drive in a new way. A way that empowers co-workers, community members, stakeholders, and fans to tackle challenges and improve the organisation. In open innovation, organisations need to utilise both internal and external resources. Table 3 compares the four principles of closed and open innovation.

Closed Innovation- The lab is our world	**Open Innovation- The world is our lab**
Hire the best and smartest.	Recognize that lots of smart people work in other places, so find ways to connect/communicate with them.
Put them in special conditions	Open your networks to diverse talents.
Innovators are free from market pressures to innovate from within.	Clever Creators/Innovators are exposed to real world needs, pressure and information exchange to create something new by engagement.
Delivered to passive customers.	Delivered to engaged customers.

Table 3-Principles of closed innovation and open innovation (Marques 2014).

Last decades were decades of deep changes, changes in ICT, especially the advances in the internet and telecommunications, globalization, competitiveness and the consequent rise in supply to meet demand.

The organisation that wants to succeed in today's world need to open the doors to the wisdom of the crowd. Needs to feel the market, the trends and must present solutions. However, just because organisations are opening the doors to outside influence, it does not mean that all of the tactics from closed innovation should be discarded.

At the core, Open innovation is the name itself: Open. Open to new people, new information and new ideas. Most important: open to learn from others. Instead of Innovation focusing a few bright minds, open innovation turns to many bright minds to share and collect information and get creative.

2.2 Open Innovation

In today's highly globalized world, high availability and mobility of skilled workers, venture capitalists fostering the creation of start-ups and an increased number of qualified suppliers work to erode the possibilities for firms to be closed. It forces them to look externally to seize opportunities that fall outside of the organization's current business or combine their technology with external technologies to unlock their potential (Chesbrough, 2003).

Open innovation has become one of the hottest topics in innovation management (Huizingh, 2011) and describes a worldwide phenomenon where people share ideas and work together through open and transparent networks for commercial or social purposes. Open innovation is the "purposive inflows and outflows of knowledge to accelerate internal innovation, and expand the markets for external use of innovation, respectively" (Chesbrough, 2006).

Although open innovation process still weeds out false positives (now from external as well as internal resources), it also enables the recovery of false negatives, that is, projects that initially seem almost worthless, but turn out to be surprisingly valuable. The logic of open innovation is based on a landscape of abundant knowledge, which must be used readily if it is to provide value to the company who created it. The knowledge that a company uncovers in its research cannot be restricted to its internal pathways to market. Similarly, its internal pathways to market cannot necessarily be restricted to using the

company's knowledge. This perspective suggests some very different organizing principles for research and for innovation (Chesbrough, 2003).

2.3 Open Innovation: Inbound and Outbound Activities

All innovations must have some degree of novelty. Accordingly, to (Oslo Manual, 2005), there are three degrees of novelty, 'new to the firm', 'new to the market' and 'new to the world'. 'New to the firm' is the minimum grade of novelty, 'new to the market' refers to the innovations that the enterprise is first to launch in its market and 'new to the world' is the maximum grade of novelty. In this sense, imitation and innovation cannot be understood nowadays without considering the trend towards being more open.

While traditional innovation has considered appropriation instruments to be a way to protect innovations from imitation, open innovation considers them to be a way of selectively revealing knowledge and capturing the knowledge rents produced without having to introduce it to the market themselves.

Open innovation activities are classified as inbound (those that use external sources to drive and develop innovation) and outbound (processes by which firms reveal information or sell their technology) (See Table 4).

Inbound Open Innovation	Sourcing	Scanning the surroundings for any new technologies, market changes etc, is called as sourcing
	Acquiring	This means acquisition is through the market, through licensing in and acquiring expertise from outside the firm. Companies tend to acquire skills and technologies for its purpose. They also tend to license in the technology or knowledge from outside the firm.
Outbound Open Innovation	Revealing	Companies occasionally reveal technology and knowledge without immediate, quick monetary benefit keeping in mind the end goal to bring issues to light of abilities in the market, to inspire cooperation.
	Selling	Selling also called as Licensing or selling technologies or knowledge to other companies for financial advantage.

Table 4-Activities of Innovation.

Empirical studies examining open innovation embracing modalities have continually found that companies perform more inbound than outbound activities even if every inbound effort from one organization should generate a reciprocal outbound effort from another one (Chesbrough and Crowther, 2006).

2.4 Open Innovation Arenas

An open innovation arena maybe defined as" an actor trying to enable open innovation within a specific field of expertise, while at the same time seeing itself as a key player in the field". Open innovation is aimed at tapping external knowledge and technology and

putting it to use internally in the firm. It is simultaneously aimed at commercializing internal knowledge and technology by finding new pathways to the external domain. This means that open innovation arena (See figure 5) is a collaboration platform with its' own vision, strategy, proprietary goals, and physical premises, while at the same time being solely constituted by its partner organizations and not an organization in the juridical sense (Aspenberg, 2012).

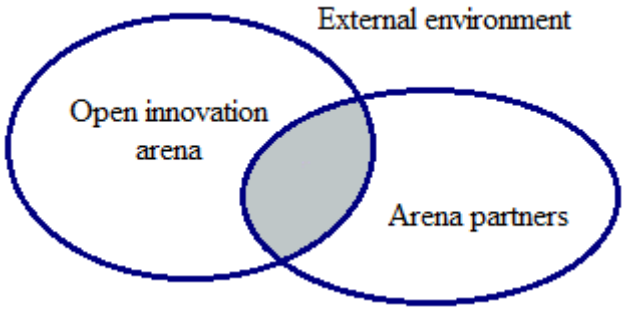

Figure 5-The open innovation arena and its relations (Aspenberg 2012).

2.4.1 Challenges faced when managing an Innovation Arena

The first type of challenge, in the interface with accomplice associations, incorporates conceivable rivalry between the field and its accomplice associations. This is related to the specificity of the open Innovation arena, which has a restrictive vision; this is not a challenge with regards to an open innovation mediator where the explicit motivation behind the arena is to bolster firms in their innovation attempts (Chesbrough, 2006), which could be one motivation behind why the writing on open innovation has not tended to the issue of rivalry. Another challenge identifies with the way projects are launched.

The second type of challenge is identified as the cooperation among the accomplice associations, incorporates the assortment of intentions in taking part in the arena. (Ollila S. and Elmquist, M. 2011), conjecture about thought processes and impetuses at the individual level. In fact, in open innovation there is a need to examine the intentions and motivators for investment at the firm level since the firm affects the management of the arena: accomplices think of each as different as associates rather than providers (Ollila S. and Elmquist, M. 2011), Nonetheless, the outcomes show that organizations may take part in open innovation as associates and at the same time as an entrepreneurial act.

The third type of challenge is identified as the role of the arena. For individuals taking part in ventures, investing much energy in the arena's physical workplaces is complicated. On the off chance that it is not clear to individuals, they will attempt to understand the arena in view of their encounters in their own organizations.

Henceforth, the arena might be an organization with every one of the desires of procedures and schedules supporting the day by day work that this understanding involves. This has critical ramifications for the administration of the open innovation field and difficulties tend to identify with cooperation in open innovation groups (Ollila S. and Elmquist, M. 2011); nonetheless, the emphasis is more evident on differing qualities at the group level - less on the authoritative level - and related to joint effort occurring in the arena.

Another problem is who should be invited to participate in the arena. The arena's manager needs to balance the growth ambition with related loss of control, for the arena and for its partner organizations. This issue has been addressed in the context of communities but until now not in relation to open innovation arenas.

2.5 External Factors impact on a Firm's ability to adopt and practice Open Innovation

2.5.1 Institutional Theory and Institutional Influences

National Innovation Systems (NIS) is defined as a "network of institutions in the public and private sectors whose activities and interactions initiate, import, and diffuse new technologies". The original definition of NIS emerged from reviewing the set of institutions and their impact on new technologies. In this regard, the research on Institutional theory, seeking to examine behaviour of organizations, individuals and other actors under institutional arrangements and settings cannot be neglected (Ahlstrom and Burton, 2010).

Therefore, the institutions and the actors within the system should also be viewed in a dynamic perspective, and the Triple-Helix model (Leydesdorff and Etzkowitz, 1996) offers this possibility. In fact, this model introduces academic institutions and

governmental agencies as the units of analysis for the industrial firms, formerly kept central in Nelson and Winter's evolutionary view (Leydesdorff and Etzkowitz, 1996).

2.5.2 Innovation systems- Institutional Influences

The idea of a National Innovation System was initially developed by Freeman and clarified by Lundvall. Seen as a subsystem inside a national economy, where different organisations and institutions collaborate and influence each other in undertaking innovative activities NIS describes the intersection of industry and research and development undertaken by many parties and players. This interaction is affected by the availability of skilled labour (education and training policies), and incentive mechanisms provided by government (Intellectual Property Rights (IPR), tariffs, subsidies, taxation, etc) (Savitskaya, I, 2011).

A refinement has been made amongst " narrow' " and " broad' " meanings of national frameworks of innovation the narrow version includes institutions which are directly involved in scientific and technological innovation and promote dissemination of knowledge. The broad perspective considers the social, cultural, and political environment embedding the narrow NIS reference from (Benoît Godin, 2010).

Furthermore, (Lundvall, 2007) points 2 approaches: the core and the context, as innovation can be seen from the inside firm point of view (core) and from the outside point of view (context/environment). The research presented in this paper follows the second approach: the narrow interpretation of a NIS. This approach is more common in studying developing countries, where the public infrastructure is presented more openly than firms' inner processes and the standard indicators of surveys on innovation research may not capture the reality of the innovation system (Lundvall, 2007).

Most of the research on NIS has been ex-post rather than ex-ante and has tried to explain and analyses existing NIS since it was developed from studies of industrialised countries, mainly studies on northern European countries. In developing countries is required an ex-ante approach for comprehensive understanding (Benoît Godin,2010).

2.6 Internal Factors impact on a firm's ability to adopt and practice Open Innovation

Literature points out several factors that are considered to influence the adoption and practice of open innovation. The concepts can be treated at different levels and can be shown on cultural values, processes and practices or artefacts (figure 6).

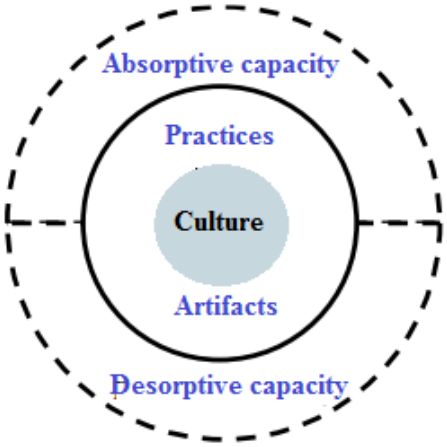

Figure 6-Factors in the internal dimension (Hallbrant & Ingvarsson, J.2012).

Also, absorptive and desorptive capacity should be considered, as absorptive capacity is a pre-condition for inbound open innovation (Spithoven *et al.*, 2010), i.e. exploration and desorptive capacity as the ability to identify opportunities where knowledge can be exploited externally, and acting on the opportunities (Gassmann and Enkel, 2004).

2.6.1 Cultural Impacts

As discussed in the previous subchapter, Institutional theory emphasizes the role of culture inside the system of innovation, designating to it the cognitive institutional pillar and acknowledging the cultural impact to be also present in the other two institutional pillars (Savitskaya, I,2011).

Apart from regulating societal norms outside the company, national culture, as one of external factors, penetrates the deepest into the internal company practices. The values and attitudes of employees are often the sequence of strong mental models imposed by national culture. In the open innovation settings, these cultural attitudes emerge in forms of "Not Invented Here" (NIH) and "Not Sold Here" (NSH) syndromes (Chesbrough

2006), which might be the result of both deep cultural believe or a technological gap and low absorptive capacity of the firm

In the cultural dimension literature, “cultural values” are the most important explanatory variables of behaviour (Savitskaya, I,2011). In this context, the work by (Hofstede,2011), based on responses by IBM staff across the world, derives four value dimensions, namely: i) power distance, ii) individualism and collectivism, iii) masculinity and femininity and iii) uncertainty avoidance.

- **National and Organizational culture**

National Culture is about the value differences between groups of nations and/or regions. As almost every human being belongs to a set of different groups at the same time, people carry several layers of mental programming within themselves, corresponding to different levels of culture (Hofstede, 1991) namely:

- national level per one’s country;
- regional and/or ethnic and/or linguistic affiliation level, as most nations are composed of culturally different people gender level;
- generation level, which separates grandparents from children;
- social class level, depending on educational opportunities, profession and occupation;
- organisational or corporate level, per the way of socialisation inside organisation.

These levels are important for the NIS and organizational performance and results. They should be always presents at strategic, tactic and operational levels. Figure 7 presents a view developed by (Hofstede, 1991)

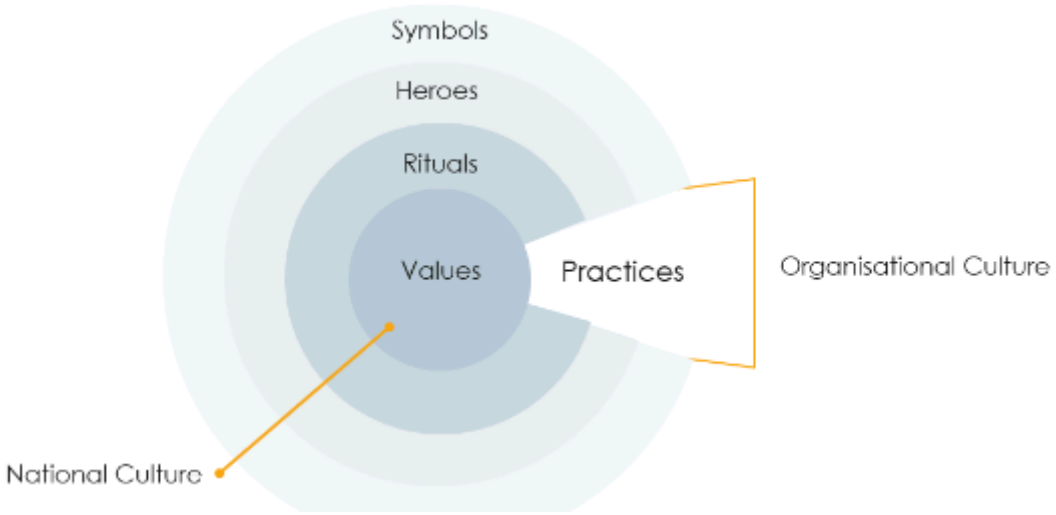

Figure 7-The different levels of culture (Hofstede 1991).

National culture is a common characteristic of people within the borders of one´s country and it should be differentiated from the culture of societies or ethnic groups.Within nations, there are strong tendencies towards integration (they share national language, education system, political system etc), but organizational culture is a social system of a different nature to that of a nation (Hofstede, 1991).

The organizational culture is being studied from many aspects. Among the studies, there has been wide research within management into the psychology of leadership, teambuilding, innovativeness and creativity, and personal human traits that arise from culture.

- **Cultural Challenges to Open Innovation: NIH (Not Invented Here) and NSH (Not Sold Here)**

As well as the challenges of finding, evaluating, negotiating, transferring and integrating the external technology into an own product, companies must face the internal resistance to external innovations. This resistance is known as the “Not Invented Here” (NIH) syndrome (Chesbrough, 2003; Van de Vrande, 2007).

It refers to a negative attitude towards knowledge coming from a source outside the institution. The Not Invented Here (NIH) syndrome is partly based on an attitude of xenophobia (Chesbrough, 2006), fear and rejection of something different from our

knowledge. Something coming from outside. This syndrome has been widely studied in the literature and indicates the consequences that it may have in companies.

Explaining the shift to an open innovation paradigm, (Chesbrough,2006) offers the following reasons for an NIH syndrome becoming prevalent: (1) fear of failing to select the right external technology, especially when the time for a project is limited and (2) fear of succeeding with integrating external technology, since it may lead in the long term to a decrease in R&D personnel in the company.

The solution Chesbrough offers deals mainly with corporate reorganization as a way of fighting employees' hostility. In the case of new enterprises, the solution will be fast growth without building unnecessary research units; not hiring extra people in the first place; for old incumbents, reassigning functions of service, development, and technology market screening for existing R&D personnel or restructuring R&D department and putting its personnel in front of the need for external technology.

The changing companies must undergo to successfully participate in knowledge transactions, something that requires not only new operating routines but also dynamic capabilities (Zollo and Winter, 2002), involving considerable changes into company's vision, strategy and culture However, the resistance to external ideas may be not only a result of the company's business model, but of each employee's values and beliefs, which may be a result of their national culture.

Beliefs must be considered to understand the potential for conflict, hidden resistance, and improve organizational awareness and development potential. This explains the tendency to filter the external information by ethnocentrism – the assumption that your own culture is central to all reality. According, to (Philippe Rosinksi,2003), ethnocentrism emerges in three forms: ignoring difference (not noticing the superiority of external technology), evaluating them negatively ("we can do it better") and downplaying their importance.

Leveraging external technologies is only half of open innovation. The other important part is to let others use your ideas. Here companies encounter the "Not Sold Here" (NSH) syndrome, the main reasoning for which is "if we are not selling it in our own sales

channels, we won't let anyone else sell it, either". Hence, sales and marketing people are affected and do insist on exclusive use of their own technology for their own product (Chesbrough, 2003).

NSH can be defined as a protective attitude towards external knowledge exploitation (Lichtenthaler, 2009) and because of it, firms may be unable to actively transfer the knowledge, even though they may be strategically intending to do it (Chesbrough, 2006). The experience of external knowledge exploitation is relatively limited (Teece *et al.*,1997; Lichthenthaler, 2009).

NSH syndrome was seldom mentioned in the literature, which mainly focused on analysing organization and market dependent challenges. However, human factor should not remain disregarded, and even under favourable conditions, the NSH can still restrain external knowledge exploitation.

2.6.2 Practices and Artifacts

In this thesis, the perspective of practices is stretched out to join internal procedures and structures as they connect to the internal and external levels. They are named artefacts, a term covering practices yet including organizational procedures and auxiliary components that depict how the organization works (Schein, 2004). Particularly two ideas are of interest here, Organizational risk taking and Management support.

- **Organizational Risk taking**

Organizational risk taking is a trait that supports developing more ground-breaking innovations through a bolder creative process, with more resources involved but also an inherently higher probability of market failure. It can be argued that without tolerance for the possibility of market failure creativity is hampered by being channelled to providing only the most obvious and safest solutions. Developing a new technology or product is inherently a risky endeavour and an open approach to innovation is associated with greater risk than a closed approach (Herzog and Leker, 2010). An Innovation has less control over its prosperity the more it relies on upon different advancements as the likelihood of something turning out badly increments. There is additionally a hazard identified with the possible estimation of an outer innovation, which for various reasons

is harder to survey (Adner,2006). As (Herzog and Leker,(2010) argue, the challenges for the firm in surveying the External technologies are fundamentally an issue of data asymmetries. The authors express that data asymmetries leave space for entrepreneurial conduct at the technology supplier and high exchange costs because of the implicit way of technological knowledge.

- **Management Support**

Top management is a key factor in overcoming the resistance from those who challenge the introduction of open innovation (Mortara *et al.,* 2009). When open innovation becomes "the way we do things around here," then there is less need for a "single head" of open innovation. Rather, it is likely to be integrated in another function of the company. At that stage, there is still a need for an open innovation centre of expertise, but less need for the political power.

According to (Chiaroni *et al*.,2011), the role of top management in the early- and mid-stages is seen as a prerequisite for the implementation of open innovation, whereby commitment and support from top management is considered to be essential. (Mortara *et al.,* 2009) echo this thought: the shift towards open innovation requires the direct involvement of top management. However, Interventions of top management can have an impact only after operational staff is convinced of the need for change. Since changes in the innovation process must be executed by operational management, attention to the role of top management is too constricted. Although top executive commitment and support are considered key factors for the successful adoption of open innovation, it would be naïve to assume that top management will easily back open innovation initiatives. There are several reasons why top management frequently fail to walk the walk when it comes to decision making necessary to adopt open innovation. Top managers do surprisingly little to build (open) innovation cultures in their companies. (Lindegaard 2010) summarizes these reasons in the following way:

- Missed out on innovation education
- Control freaks
- Too far away from the action
- Lack a holistic vision

Besides acting as a driver for change, top management is required to take actions aimed towards developing and exploiting innovation activities.

The tasks of top management can be summarized as follows, (Huizingh, 2011).

1. defining how the company will identify and generate value from innovation,
2. budgeting and allocating resources,
3. developing a clear vision and strategy for open innovation
4. defining how the company will identify and generate value from innovation
5. monitoring and evaluating results.

In addition, top management is required to provide commitment, budget and support to the open innovation implementation team (Mortara *et al*., 2009).

2.6.3 Absorptive capacity

When Cohen and Levinthal coined the term absorptive capacity, they defined it as "the ability of a firm to recognize the value of new information, assimilate it, and apply it to commercial ends" (Cohen and Levinthal, 1990). Although the concept of absorptive capacity was developed long before Chesbrough conceived open innovation, researchers and practitioners are currently discussing it in the context of the open innovation paradigm. Simply put, a firm's absorptive capacity is one factor that determines how porous its boundaries are, for exploration purposes. ACAP has two essential features: first – absorptive capacity is "cumulative" (Cohen, Levinthal, 1990): firms with a given level of technological, market and organisational knowledge may be more successful in those areas than in others. Second – prior knowledge affects anticipation: firms can forecast future events with greater accuracy in fields where they have previous experience.

Core to the concept of absorptive capacity is the complementary effect of "outward-looking" accessing and adopting of external knowledge and the "inward-looking" internal invention process (Cohen & Levinthal,1990).

Tracking the work of (Cohen and Levinthal,1990) (Zahra and George 2002) argued that "firms can acquire and assimilate knowledge, but might not have the capability to transform and exploit the knowledge for profit generation" and thus deconstructed absorptive capacity into potential absorptive capacity (PACAP) and realized absorptive capacity (RACAP). PACAP consists of knowledge acquisition, which "refers to a firm's capability to identify and acquire externally generated knowledge that is critical to its

operations" and knowledge assimilation which "refers to the firm's routines and processes that allow it to analyse, process, interpret and understand the information obtained from external sources"

2.6.4 Desorptive capacity

Desorptive capacity could be just considered the reverse, as the ability to release knowledge toward a recipient that is able to give it, immediately or soon, a commercial output. Absorptive/Desorptive Capacity are both influenced by the degree of motivation—to transfer and/or learn and use—that actors belonging to both sides (university to industry (U-I)) attribute to the transfer process (Minbaeva *et al.*, 2003). It is important that transferor and recipient perceive the importance of the transfer in order to have greater motivation to support it. Teaching/learning skills, a gap in the level of technical skills, personal experience, and purpose of the transfer are all relevant to the success of the transfer process.

In order to exploit internal knowledge, it must first be generated internally. This is in line with (Gassmann and Enkel, 2004) argument that one part of being multiplicative is the capability to multiply knowledge. (Chesbrough, 2006) recognizes the role of internal R&D in this context and further argues that companies should organize their R&D to generate output that can be exploited externally.

(Gassmann and Enkel, 2004) argue that a company must be able to codify and share its knowledge with the external entity for successful exploitation. As with absorptive capacity, this requires organizational structures that can transfer that knowledge and again gatekeepers are important.

2.7 Tailoring a firm's network

Open innovation is almost by definition related to establishment of ties with external actors such as (1) suppliers, (2) clients or customers, (3) competitors, (4) consultants, (5) commercial laboratories or R&D enterprises, (6) universities or other higher education institutes, (7) government research organizations, to (8) private research institutes (Laursen and Salter, 2006).

The speed of change, both in terms of competition and in technology, stimulates the development of multiple forms of cooperation between economic agents. Cooperation is used to be faster, to get broader international action, to benefit from the dynamics of expertise of various partners, to reduce costs, to gain in scale, to access additional knowledge. Cooperation in RDI activities becomes critical to enable businesses, regardless of size, to raise productivity, reduce costs of those activities and to enhance and speed up market results. Cooperation may take different forms.

Such cooperation may involve the establishment of a formal contract, but it may also have an informal nature, as often happens with relations between clients and suppliers. This point aims at questioning the organizations about their foreign relations concerning innovation (COTEC, 2009).

3.Settings for Open Innovation

3 Settings for Open Innovation

3.1 Introduction

The world is changing and there are a lot of tools for evaluate innovation processes in organizations. For this study we used the innovation scoring model developed in Portugal by IAPMEI (Portuguese Agency for SME and Innovation) and COTEC Portugal (Business Association for Innovation).

The **Innovation Scoring** aims to contribute to the strategic reflection of companies or other organizations on their innovation processes, enabling not only a deeper knowledge of the different dimension that sustain such processes, but also the identification of Areas of potential improvement.

The first version of the Innovation Scoring System was developed by COTEC in 2007. In 2008 become accessible online, through a platform available to companies. Since its launch, this platform has been systematically used by around 700 companies in Portugal, which have used it to evaluate their innovation performance and to access many advantages offered by COTEC and IAPMEI.

3.2 Practical Work

For the practical work we used "The Innovation scoring" method which consists of Five dimensions (Conditions, Resources, Process, Enhancers and Impacts). For our study, a questionnaire is developed for twenty-four (24) questions which revolves around these dimensions, namely Conditions, Resources and Processes. With the help of these questions we can understand the factors required and difficulties faced when creating an Open Innovation arena. This survey questionnaire was conducted among Twenty-five (25) researchers from INESCTEC.

This questionnaire survey mainly focuses on the following factors:

- Conditions
    - Culture
    - Leadership

    - Strategy
- Resources
    - Human Capital
    - Competencies
    - External Relations
    - Structures
- Processes
    - Management of RDI activities
    - Systematic learning and improvement
    - Protection and assessment of results

The reasons why we chose these factors are duly explained in the following text and the Questionnaire model is included in the Appendix. The three dimensions in the questionnaire are rated by using these five options,

- Excellent
- Integrated
- Defined
- Reactive
- Non-Existent

3.2.1 Conditions

This dimension concerns environmental and strategic aspects which may influence business attitudes and behaviour innovation. Three aspects are considered: Culture, where it is intended to reflect the adequacy between the dynamics of change inherent in innovation; Leadership, seeking to assess how characteristics and style are likely to stimulate innovation; Strategy on the training and implementation of strategic orientations of the organization.

- **Culture**

Culture is one of the key factors that determines how successful the organization will be. Culture must be aligned with the organization's strategy, goals vision, business-model for long term success. Culture is a critical enabler and success factor for open innovation. Open innovation requires a culture where collaboration, knowledge-sharing, co-

development, etc. are highly valued. Organizational culture is the personality of an organization.

This dimension consists of four questions, namely:

Question 1: The values of the organization promote adaptability, experiment, learning and continuous change.

Question 2: The values of the organization promote international openness.

Question 3: The internal communication of the organization integrates various perspectives, resorting to formal and informal mechanisms of circulating information and sharing knowledge.

Question 4: The organization's culture stimulates entrepreneurship and the capacity to take risks, without penalizing failures.

Based on the answers, a pie chart has been used to display the following results:

When questioned about if the values of the organization promote adaptability, experiment, learning and continuous change, 60% of the interviewed rates it as excellent and 40% rates it as integrated. No one rates it as non-existent, reactive or even defined (See figure. 8)

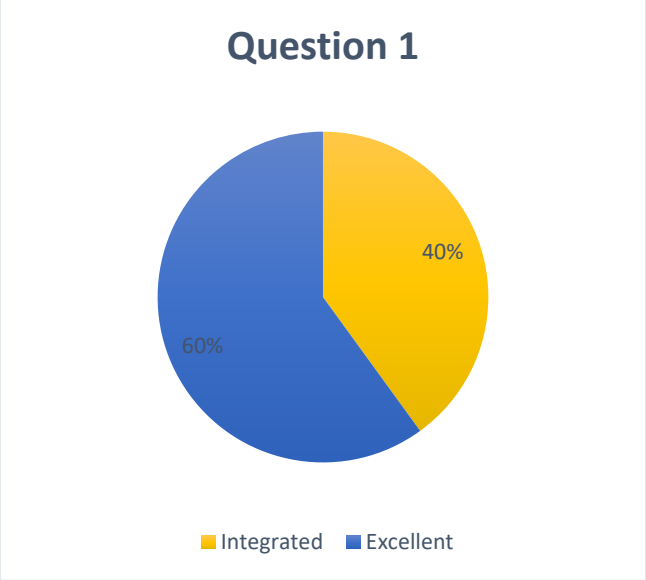

Figure 8-Results for Question 1.

When asked about if the values of the organization promote International openness, 48% of the interviewed rates it as excellent and 52% rates it as integrated. No one rates it as non-existent, reactive or even defined (See figure. 9)

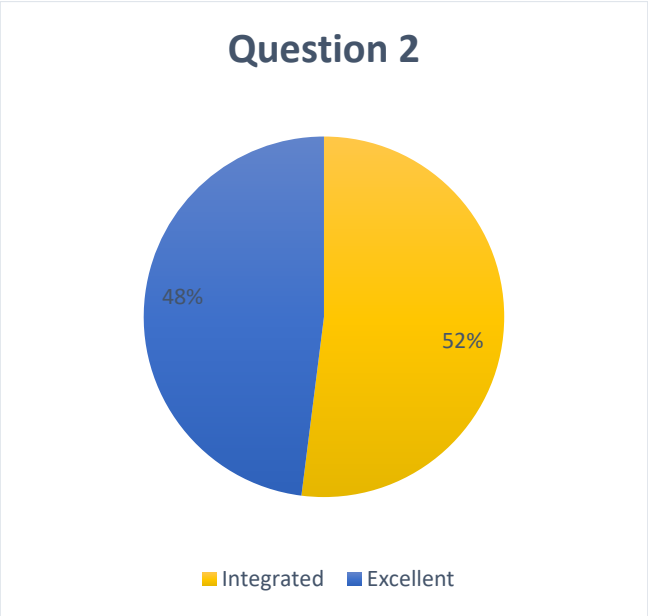

Figure 9-Results for Question 2.

When inquired whether if the internal communication of the organization integrates various perspectives such as resorting to formal and informal mechanisms, 28% of the interviewed rates it as excellent, 40% rates it as integrated and 32% rates it as defined. No one rates it as non-existent or reactive (See figure. 10)

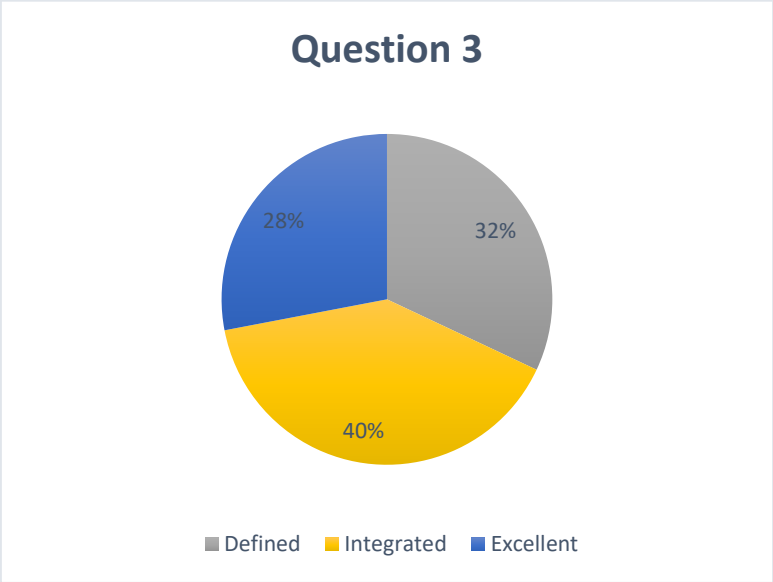

Figure 10-Results for Question 3.

When inquired whether if the organization's culture stimulates entrepreneurship and the capacity to take risks without penalizing failures, 24% of the interviewed rates it as

excellent, 48% rates it as integrated and 28% rates it as defined. No one rates it as non-existent or reactive (See figure. 11)

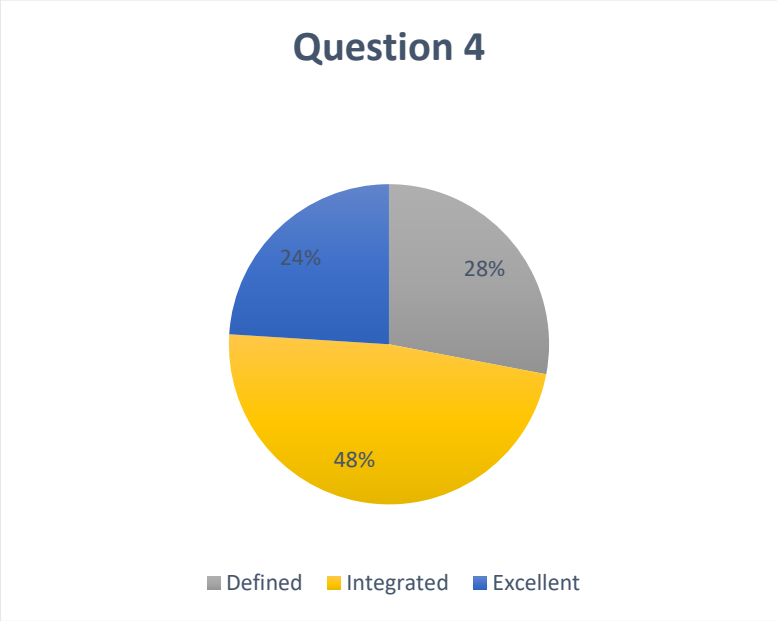

Figure 11-Results for Question 4.

- **Leadership**

Leadership is defined by various authors which reflects a common concept of influencing other people or members of groups or organizations to "guide, structure and facilitate activities and relationships" A leader does not necessarily have to be the head of the organization or the group, but (s)he can show behaviour which is characteristic of leaders. It is the ability of an individual to "influence, motivate and enable others to contribute to the effectiveness and success of the organization". It is stressed that the human factor in OI, culture and leadership is very important, as it is people who push the innovation process. This aspect is relevant for all organizational levels, from top management, to middle managers, the project managers and the researchers, as they determine the firm's degree of openness and the organizational culture.

This dimension consists of one question:

Question 5: Leadership structures promote the appearance of leaders for developing innovative activities through the responsibility and autonomy of its staff.

When asked if the organization's leadership structures promote the appearance of leaders for developing innovative activities through the responsibility and autonomy of its staff,

20% of the interviewed rates it as excellent, 40% rates it as integrated, 32% rates it as defined and 8% rates it as reactive. No one rates it as non-existent (See figure. 12)

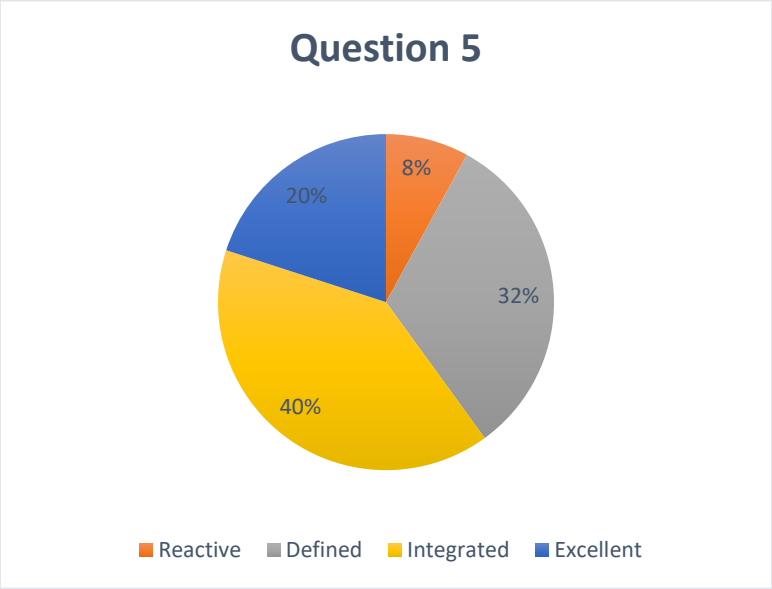

Figure 12-Results for Question 5.

- **Strategy**

An innovation strategy is referred as a functional strategy to "determine what degree and in what way a firm attempts to use innovation to execute its business strategy and improve its performance". A successful innovation process itself contains a tactic for implementing and combining technical, market or business models to create new or improved products or services for the market to use.

This dimension consists of two questions, namely:
Question 6: The organization has a clear and shared innovation strategy, engaging the staff in its definition.
Question 7: Innovation strategy appears as a plan of action with quantitative purposes and targets on medium and long term.

When questioned that if the organization has a clear and shared innovation strategy, engaging the staff in its definition, 8% of the interviewed rates it as excellent, 24% rates it as integrated, 60% rates it as defined and 8% rates it as reactive. No one rates it as non-existent (See figure. 13)

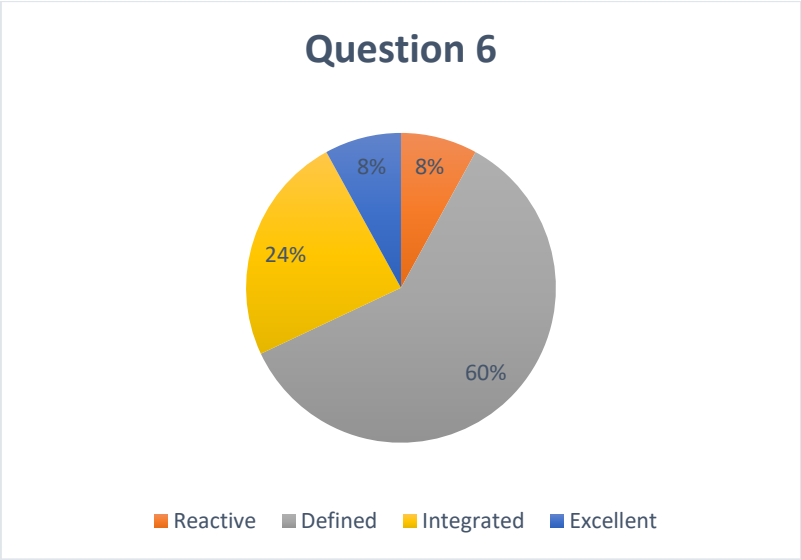

Figure 13-Results for Question 6.

When asked that if the organization's innovation strategy appears as a plan of action with quantitative purposes and targets on medium and long term, 8% of the interviewed rates it as excellent, 12% rates it as integrated, 72% rates it as defined and 8% rates it as reactive. No one rates it as non-existent (See figure. 14)

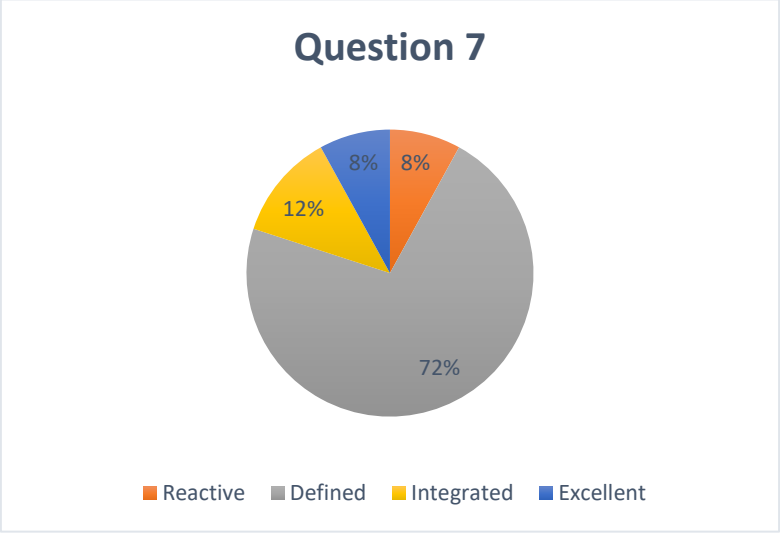

Figure 14-Results for Question 7.

3.2.2 Resources

The objective of this dimension is to assess the contribution of resources of the organization to ensure greater dynamics and better innovative performance. There are multiple typologies of organizational resources. In this dissertation 4 types of resources are considered: Human Capital, where evaluate the way in which the management of

human resources in the organization is oriented towards innovation; Skills Organizations, corresponding to the analysis of competencies and capabilities of the organization that are most relevant to innovative performance and, consequently, its competitive affirmation; External Relationships, seeking to how the company uses external connections, and more cooperation with other entities innovation; and Organizational Structures supporting the innovation activities.

- **Human Capital**

The relational capital is not present independently, but in relation to human (capital of managers, employees) and structural capital, as a component of the intellectual capital. The relational capital emerges as a result of well-thought actions - it depends on strategic decisions and organized actions. A basis for emergence of relational capital is the ability to establish and maintain relationships with the interested parties. These relationships are based on cooperation and mutual trust.

This dimension consists of three questions, namely:
Question 8: The organization has a human capital policy oriented to innovation.
Question 9: The organization has a training policy for its staff, oriented to innovation.
Question 10: The organization stimulates and supports creativity and innovative initiative from its staff.

When questioned that if the organization has a human capital policy oriented to innovation, 12% of the interviewed rates it as excellent, 68% rates it as integrated and 20% rates it as defined. No one rates it as non-existent or reactive (See figure. 15)

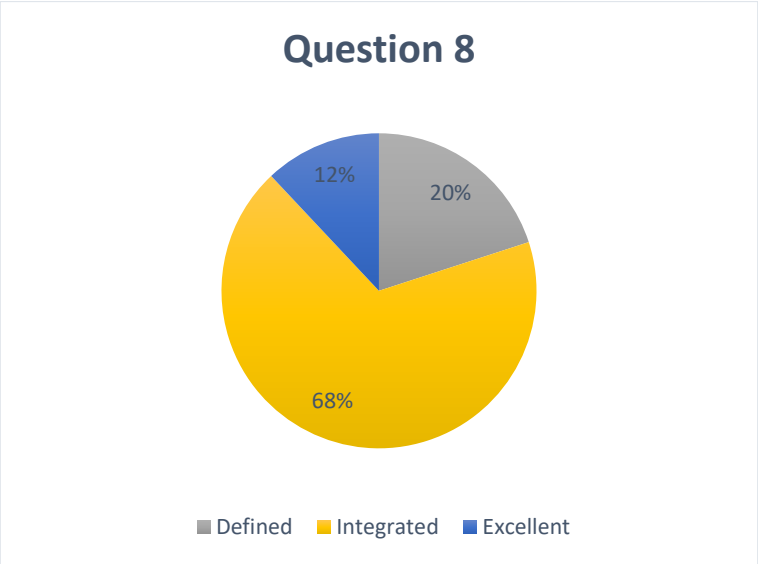

Figure 15-Results for Question 8.

When asked that if the organization has a training policy for its staff oriented to innovation, 4% of the interviewed rates it as non-existent, 44% rates it as integrated, 20% rates it as defined and 32% rates it as reactive. No one rates it as excellent (See figure. 16)

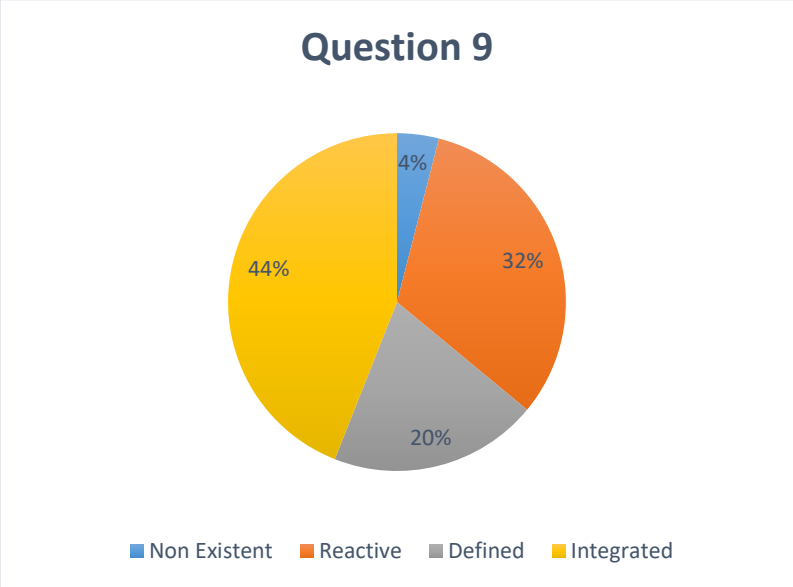

Figure 16-Results for Question 9.

When questioned that if the organization stimulates and supports creativity and innovative initiative from its staff, 8% of the interviewed rates it as excellent, 48% rates it as integrated, 16% rates it as defined and 28% rates it as reactive. No one rates it as non-existent (See figure. 17)

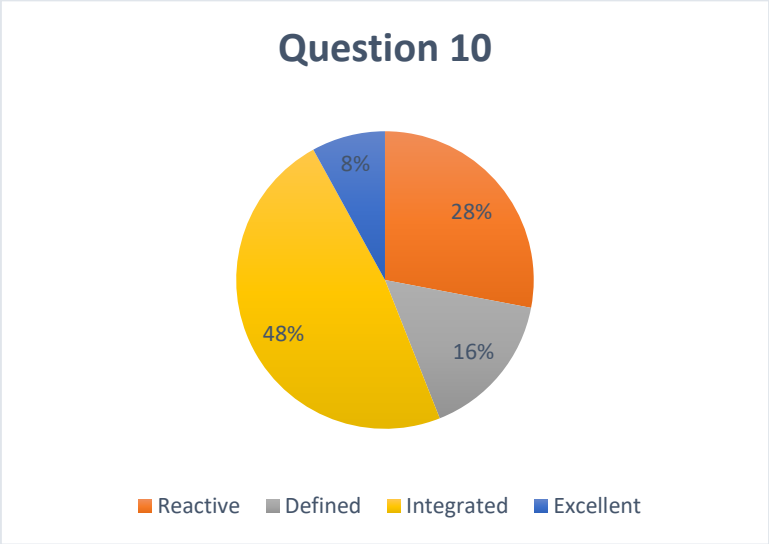

Figure 17-Results for Question 10.

- **Competencies**

Researchers have found the concept of competence attractive for describing essential human knowledge, attitudes, and skills at work, because of the concept's focus on the relation between person and work. Competencies are assumed to be recognizable, assessable, and relevant for practice. Moreover, competencies can be developed, learned, and described at different levels, and are supposed to have a strong relationship with organizational effectiveness.

This dimension consists of two questions, namely:

Question 11: The organization systematically proceeds to the identification, consideration and planning of the development of its organizational competencies.

Question 12: The organization has the adequate technical competencies for performing RDI activities.

When questioned that if the organization systematically proceeds to the identification, consideration and planning of the development of its organizational competencies, 16% of the interviewed rates it as integrated, 60% rates it as defined and 24% rates it as reactive. No one rates it as non-existent or excellent (See figure. 18)

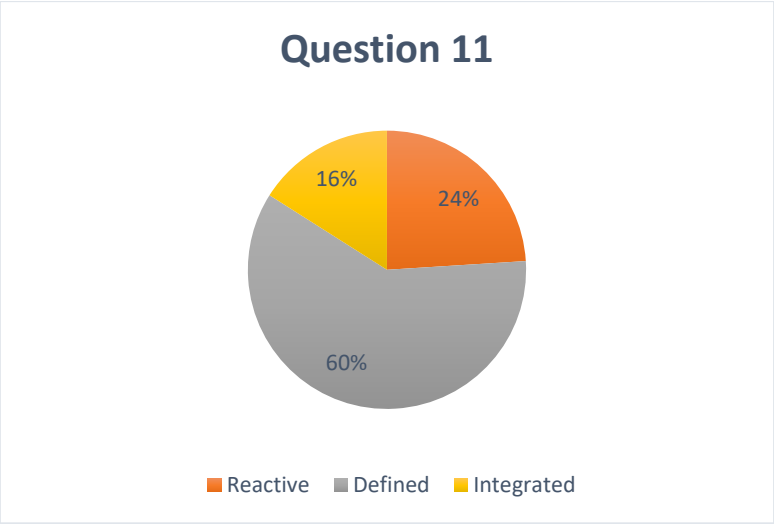

Figure 18-Results for Question 11.

When inquired about that if the organization has the adequate technical competencies for performing RDI activities, 20% of the interviewed rates it as excellent, 20% rates it as integrated, 52% rates it as defined and 8% rates it as reactive. No one rates it as non-existent (See figure. 19)

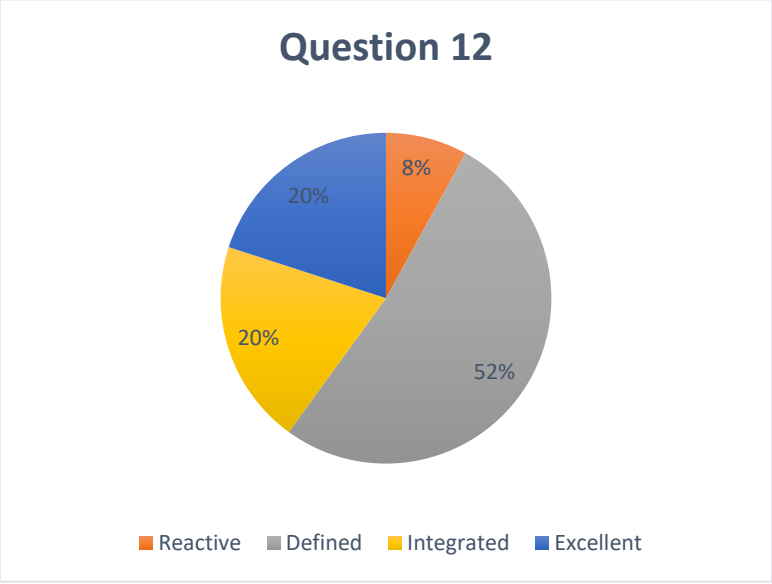

Figure 19-Results for Question 12.

- **External Relations**

The empiric literature regarding on technological innovation suggests that cooperation has a highly positive effect on the performance of firm's technological innovation, however, very little is known about its impact on the organizational innovation.

This dimension consists of two questions, namely:

Question 13: The organization develops systematic cooperation actions on innovation with external entities.

Question 14: The organization boosts many ways of networking.

When questioned that if the organization develops systematic cooperation actions on innovation with external entities, 48% of the interviewed rates it as excellent, 44% rates it as integrated and 8% rates it as defined. No one rates it as non-existent or reactive (See figure. 20)

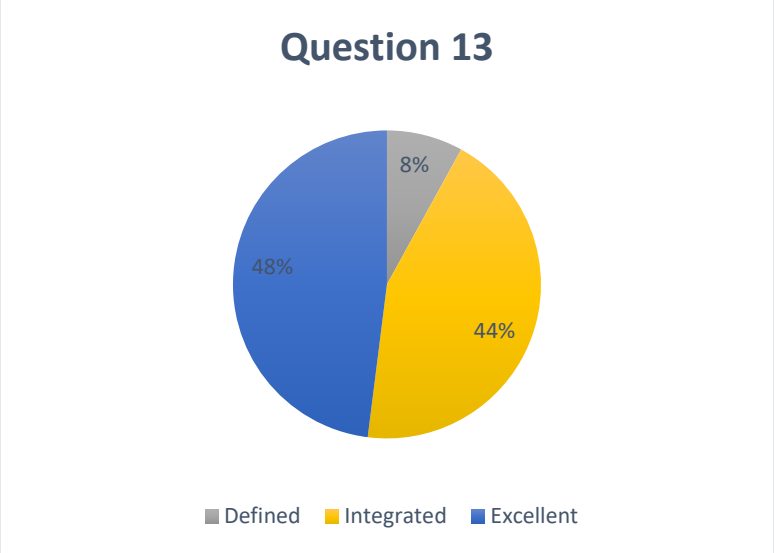

Figure 20-Results for Question 13.

When questioned that if the organization boosts many ways of networking, 16% of the interviewed rates it as excellent, 72% rates it as integrated and 12% rates it as defined. No one rates it as non-existent or reactive (See figure. 21)

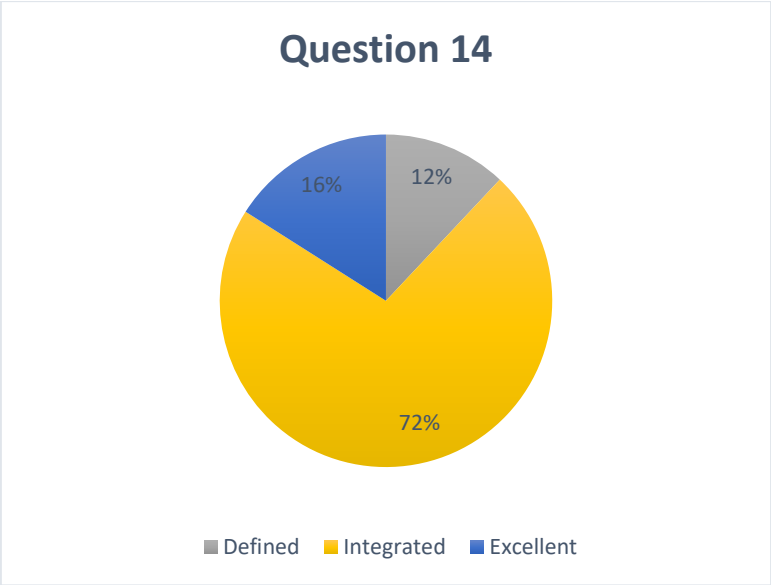

Figure 21-Results for Question 14.

- **Structure**

Organizations should develop organizational architecture suitable for open innovation, including structures, processes, and routines, to put ideas from external sources into action, each organization must identify the best ideas, conduct internal feasibility and profitability analyses, and implement them in development projects. Organizational structure is an important managerial lever for open innovation.

This dimension consists of three questions, namely:

Question 15: The organization has an organizational structure dedicated to RDI activities

Question 16: The organization has the adequate structures for managing knowledge.

Question 17: The organization has information and communication systems enabling innovation.

When inquired whether that if the organization has an organizational structure dedicated to RDI activities, 12% of the interviewed rates it as excellent, 44% rates it as integrated, 32% rates it as defined and 12% rates it as reactive. No one rates it as non-existent (See figure. 22)

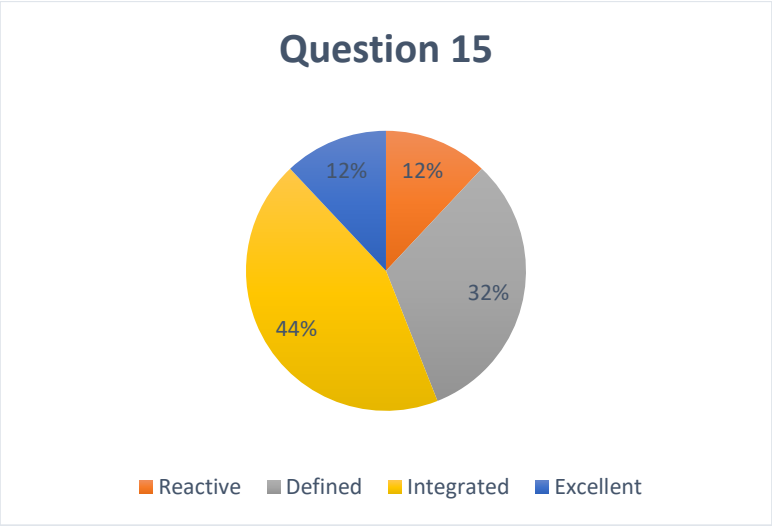

Figure 22-Results for Question 15.

When questioned that if the organization has the adequate structures for managing knowledge, 4% of the interviewed rates it as excellent, 56% rates it as integrated, 20% rates it as defined, 16% rates it as reactive and 4% rates it as non-existent. (See figure. 23)

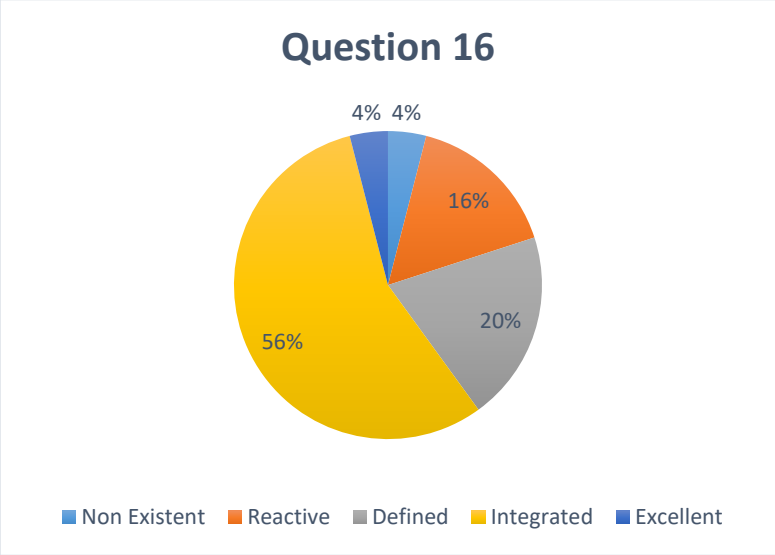

Figure 23-Results for Question 16.

When questioned that if the organization has information and communication systems enabling innovation, 4% of the interviewed rates it as non-existent, 46% rates it as integrated, 42% rates it as defined and 8% rates it as reactive. No one rates it as excellent (See figure. 24)

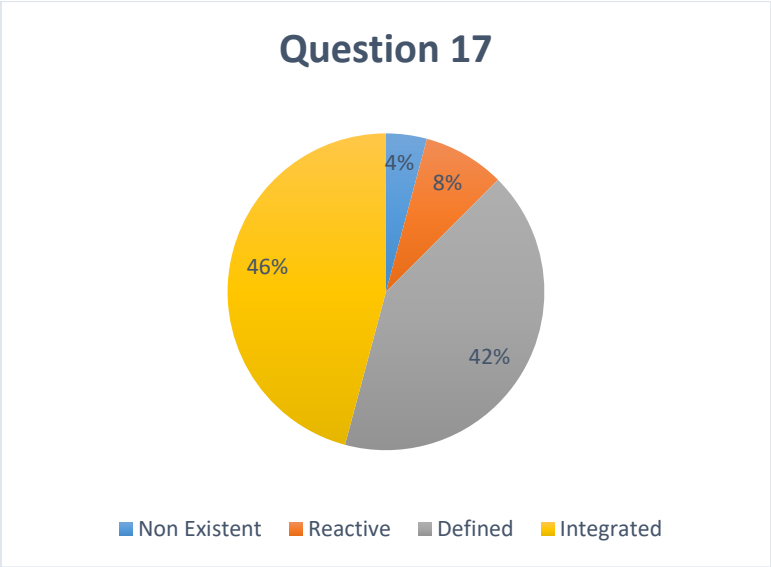

Figure 24-Results for Question 17.

3.2.3 Processes

The objective of this dimension is to analyse the most relevant organizational processes for the new innovative dynamics of the organization and the performance of these in the innovative domain. Three groups of processes are considered: Management of RDI activities, comprising the different facets of the development of this type of activities, namely the management of innovation projects, the interpretation of the market, the design and development of new products and / or services, the interdepartmental collaboration, the setting up of project teams, the evaluation of innovation activities and the concern to innovate in all activities of the value chain; Learning and systematic improvement, respecting the application of the lessons learned and the implementation of good practices; and Protection and enhancement of the results of RDI activities.

- **Management of RDI activities**

The advantages of cooperation are increasing in the open innovation era. As the focus shifted from purely internal R&D activities, the academic community started emphasizing that the firms should be open to outside innovation. 'Not all the smart people work for us. We need to work with smart people inside and outside our company' (Chesbrough, 2003).

This dimension consists of four questions, namely:

Question 18: The organization develops systematic processes for understanding needs, expectations and market opportunities.

Question 19: The organization has systematic processes for generating, identifying and selecting ideas and concepts of new products, processes, services and business and/or organization models.
Question 20: The organization develops systematic processes for interdepartmental co-operation.
Question 21: The organization has well-defined routines for building and defining the tasks concerning the project teams.

When asked that if the organization develops systematic processes for understanding needs, expectations and market opportunities, 40% of the interviewed rates it as integrated, 32% rates it as defined and 28% rates it as reactive. No one rates it as non-existent or excellent (See figure. 25)

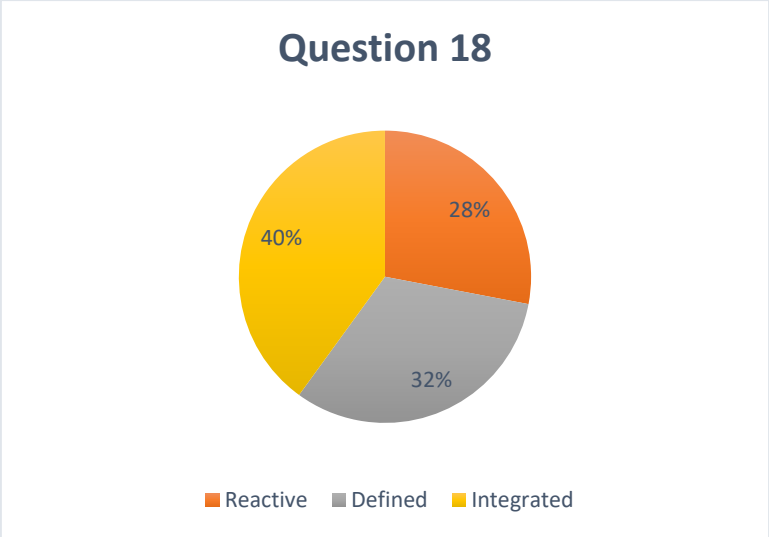

Figure 25-Results for Question 18.

When questioned that if the organization has systematic processes for generating, identifying and selecting ideas and concepts of new products or processes, 8% of the interviewed rates it as excellent, 24% rates it as integrated, 64% rates it as defined and 4% rates it as reactive. No one rates it as non-existent (See figure. 26)

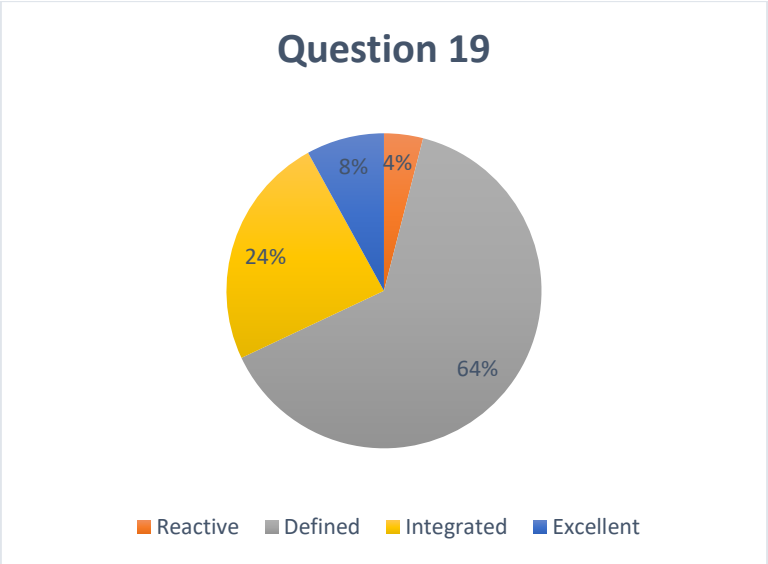

Figure 26-Results for Question 19.

When asked that if the organization develops systematic processes for interdepartmental co-operation, 8% of the interviewed rates it as excellent, 20% rates it as integrated, 68% rates it as defined and 4% rates it as reactive. No one rates it as non-existent (See figure. 27)

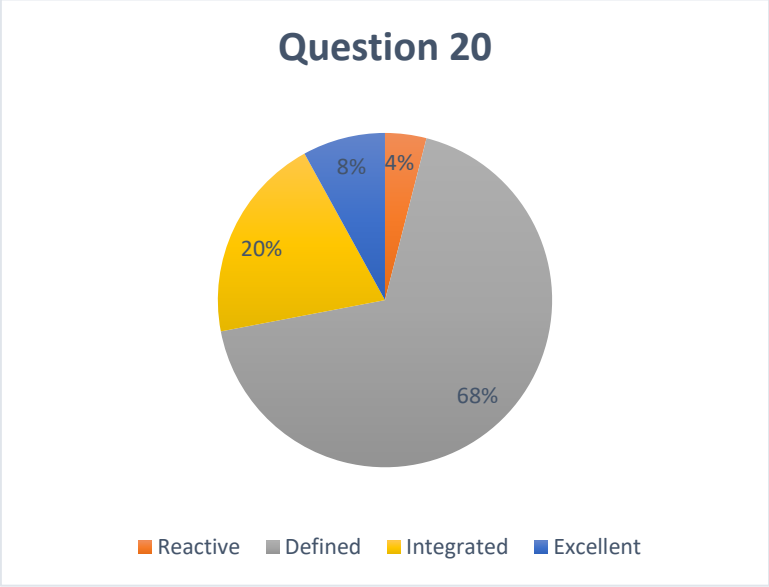

Figure 27-Results for Question 20.

When inquired whether that if the organization has well defined routines for building and defining tasks concerning the project teams, 16% of the interviewed rates it as excellent, 64% rates it as integrated, 16% rates it as defined and 4% rates it as reactive. No one rates it as non-existent (See figure. 28)

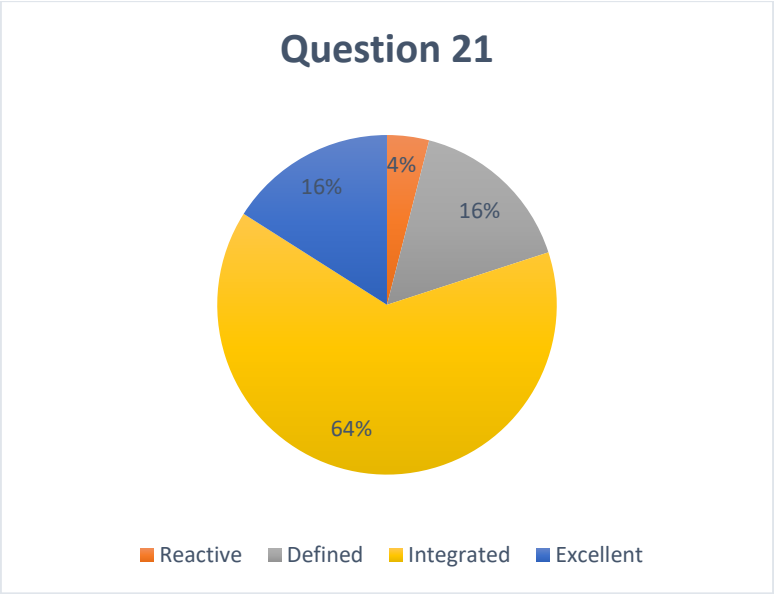

Figure 28-Results for Question 21.

- **Systematic learning and Improvement**

We are now in the hype of the knowledge society where information and knowledge is accessible and being a part of the competitiveness of organizations and also individuals. As innovation is now widely acknowledged as one of the main drivers of the knowledge society, there has been an increasing interest in studying the innovation process.

This dimension consists of two questions, namely:

Question 22: The organization incorporates into its activities all the learning obtained.

Question 23: The organization has systematic devices for adopting good practices.

When questioned that if the organization incorporates into its activities all the learning obtained, 28% of the interviewed rates it as excellent, 8% rates it as integrated, 48% rates it as defined and 16% rates it as reactive. No one rates it as non-existent (See figure. 29)

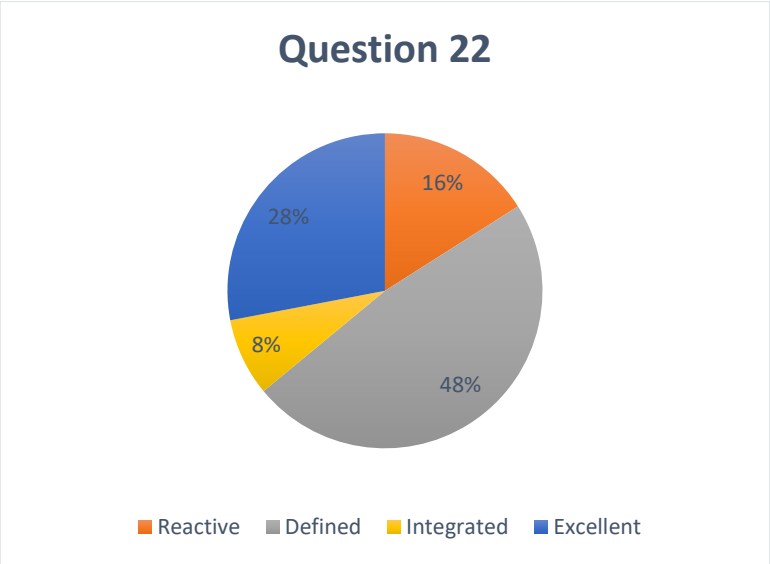

Figure 29-Results for Question 22.

When questioned that if the organization has systematic devices for adopting good practices, 12% of the interviewed rates it as excellent, 44% rates it as integrated, 32% rates it as defined and 12% rates it as reactive. No one rates it as non-existent (See figure. 30)

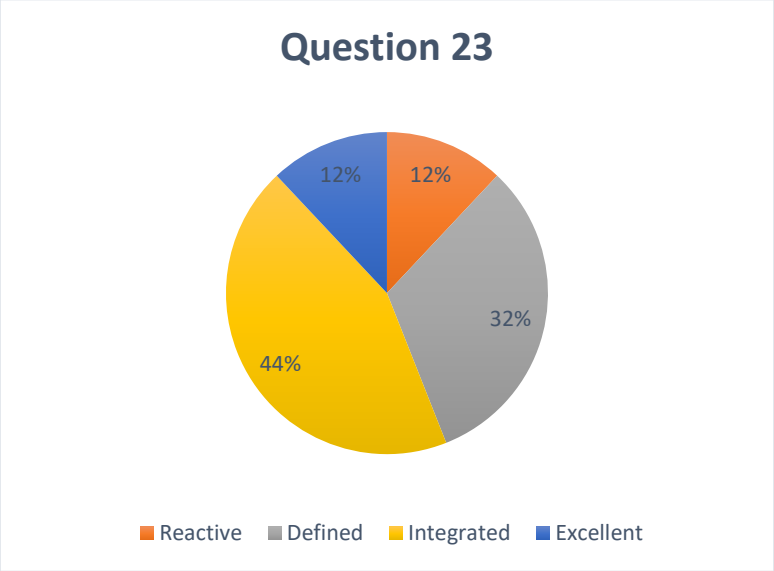

Figure 30-Results for Question 23.

- **Protection and Assesment of results**

This dimension consists of one question, namely:

Question 24: The organization has defined processes for evaluating and deciding on the protection and assessment of its intellectual capital and the results of RDI

activities.

When asked that if the organization has defined processes for evaluating and deciding on the protection and assessment of its intellectual capital and the results of RDI activities, 8% of the interviewed rates it as excellent, 52% rates it as integrated and 40% rates it as defined. No one rates it as non-existent or reactive (See figure. 31)

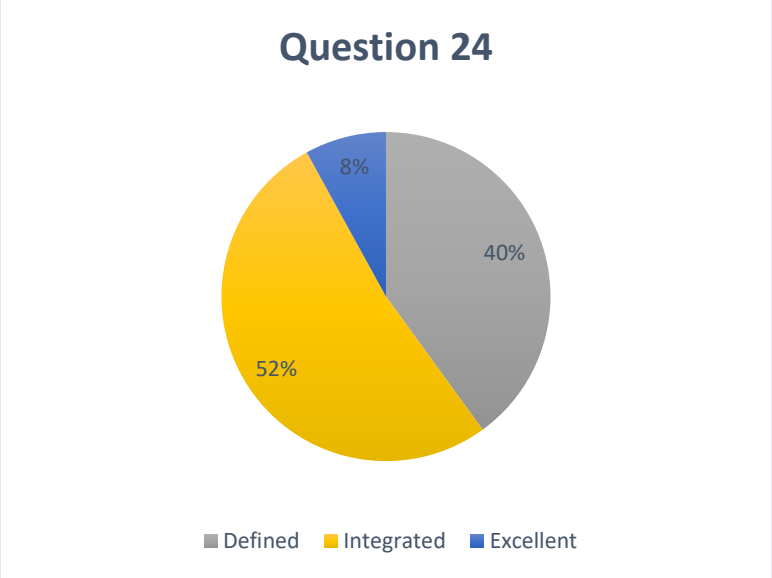

Figure 31-Results for Question 24.

3.3 Data Analysis

From the above collected results we can perform a data analysis. The Questionnaire used five options for evaluating the collecting data. The options were five and were related with:

Excellent-5 points
Integrated-4 points
Defined-3 points
Reactive-2 points
Non-Existent-1 point.

Now calculate the maximum value that can be achieved and compare it with the desired results.

The Maximum Value and the Achieved value are displayed in table 5,

	Maximum	Achieved	Percentage (%)
Conditions	875	675	77.14
Resources	1250	888	71.04
Process	875	611	69.82

Table 5- Maximum and Achieved values.

From Figure 32, we can see that the Maximum and achieved are values are close to each other.

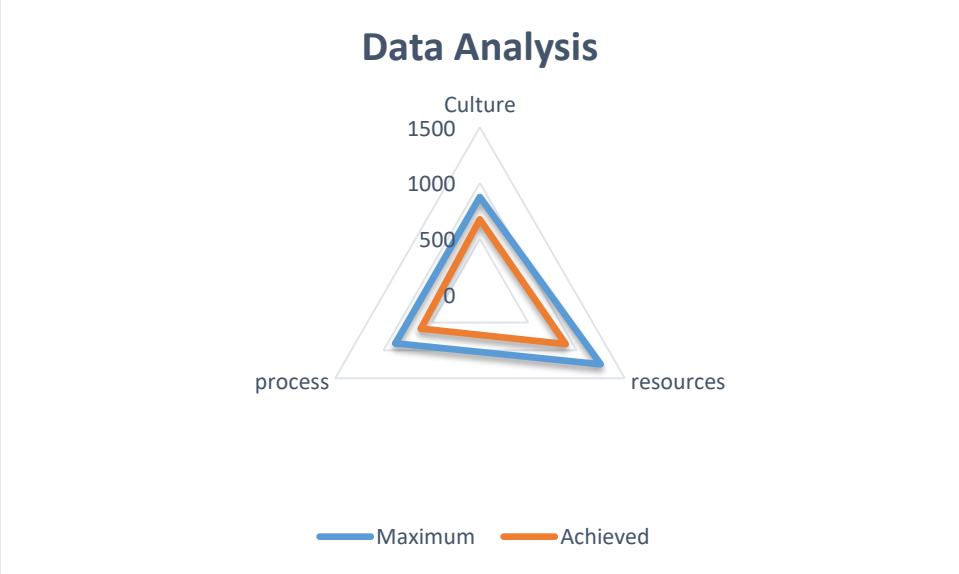

Figure 32-Data Analysis

Based on the percentage values from table 5, we can see that the process dimension has some less value compared to culture and resources. But all the three dimensions (Conditions, resources and Process) are near the 75th percentile, which is a good indicator. However, be good can become excellent if worked in a continuous learning process. This logic leads us to the need of understanding what can be improved.

In this sense, we considered all the questions that got the least number of rating in each dimension and then we will introduce them.

For the first dimension (conditions), particularly aspect Strategy, the question 7 has got the low rating. When asked that if the organization's innovation strategy appears as a plan

of action with quantitative purposes and targets on medium and long term, 8% of the interviewed rates it as excellent, 12% rates it as integrated, 72% rates it as defined and 8% rates it as reactive. These results seem to point up that the organization must improve in its innovation strategy as a plan of action with quantitative purposes and targets on long and medium term.

For the second dimension (resources), the questions 9,16, and17 are the lowest rated. These 3 questions commonly have the non-existent rating as 4%. If the question gets this non-existent rating, then the organisation drastically needs to improve in those categories or needs to make aware of this situation. So, in this dimension the organisation must improve its training policy for its staff towards innovation, should have adequate structures for managing knowledge and should also develop the information and communication systems to enable the innovation process.

For the third dimension (processes), the question 20 has got the low rating. When inquired whether that if the organization has well defined routines for building and defining tasks concerning the project teams, 16% of the interviewed rates it as excellent, 64% rates it as integrated, 16% rates it as defined and 4% rates it as reactive. These results seem to point out that the organisation must improve in developing its systematic processes for interdepartmental co-operation.

4. CONCLUSION

4.1 PROPOSALS FOR FUTURE WORK

4 CONCLUSION

The purpose behind this dissertation is to examine the settings for Open Innovation arena. More particularly the dissertation looks at how a firm can make conditions for taking advantage of outside performers' knowledge at the crossing point of the firm boundary and the outside world in a composed path by making a physical place that encourages collaboration and permits the firm to use remotely accessible information in a compelling way. Such physical spots are signified open Innovation arenas and have up to this point not got much consideration by researchers and scholars.

A questionnaire survey has been conducted among 25 INESC TEC researchers, host Institution of the dissertation researcher and prepared under bases of the Innovation scoring model. This model, developed by Portuguese private and public organizations, considers Five dimensions of analyse, namely Conditions, Processes, Resources and Enhancers and Impacts. In this dissertation, we only used the first three dimensions.

The main results show that INESC TEC promotes innovations and brings together a wide range of conditions that encourage open innovation. The three dimensions are near the 75th percentile, which is a good indicator.

The best dimension in INESC TEC seems to be Conditions (77,14%), followed by Resources (71,04%). Processes appears at the end (69,82%). From a more focused perspective, everything indicates that:

- the organization must improve in its innovation strategy as a plan of action with quantitative purposes and targets on long and medium term;
- the organisation must improve its training policy for its staff towards innovation, should have adequate structures for managing knowledge and should also develop the information and communication systems to enable the innovation process;
- the organisation must improve in developing its systematic processes for interdepartmental co-operation.

4.1 PROPOSALS OF FUTURE WORKS

In this dissertation, the survey was conducted only for a limited number of researchers and the questionnaire survey consisted of three dimensions. For furthermore work or in the near future, all five dimensions from the innovation scoring can be considered and the survey can be conducted for a large number of researchers and also the Top-level executives from the organisation. It will also be interesting to extend this to other research centres and universities, as they are key players to promote open innovation near SME's and Big companies.

5. REFERENCES

5 REFERENCES

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6. Annexes

6 ANNEXES

	non-existent	reactive	Defined	Integrated	excellent
8					
CULTURE					
1. The values of the organization promote adaptability, experiment, learning and continuous change.					
2. The values of the organization promote international openness.					
3. The internal communication of the organization integrates various perspectives, resorting to formal and informal mechanisms of circulating information and sharing knowledge.					
4. The organization's culture stimulates entrepreneurship and the capacity to take risks, without penalizing failures.					
LEADERSHIP					
5. Leadership structures promote the appearance of leaders for developing innovative activities through the responsibility and autonomy of its staff.					
STRATEGY					
6. The organization has a clear and shared innovation strategy, engaging the staff in its definition.					
7. Innovation strategy appears as a plan of action with quantitative purposes and targets on medium and long term.					
RESOURCES: The purpose of this measure is to assess the contribution of various types of organization resources to secure greater dynamics and a better innovative performance.					
HUMAN CAPITAL					
8. The organization has a Human Capital policy oriented to innovation.					
9. The organization has a training policy for its staff, oriented to innovation.					
10. The organization stimulates and supports creativity and innovative initiative from its staff.					

non-existent reactive Defined Integrated excellent

COMPETENCIES					
11. The organization systematically proceeds to the identification, consideration and planning of the development of its organizational competencies.					
12. The organization has the adequate technical competencies for performing RDI activities.					
EXTERNAL RELATIONS					
13. The organization develops systematic cooperation actions on innovation with external entities.					
14. The organization boosts many ways of networking.					
STRUCTURES					
15. The organization has an organizational structure dedicated to RDI activities					
16. The organization has the adequate structures for managing knowledge.					
17. The organization has information and communication systems enabling innovation.					
PROCESSES: The purpose of this dimension is to analyse the more relevant organizational processes for the new innovative dynamics of the organization and the performance of these in the innovation domain					
MANAGEMENT OF RDI ACTIVITIES					
18. The organization develops systematic processes for understanding needs, expectations and market opportunities.					
19. The organization has systematic processes for generating, identifying and selecting ideas and concepts of new products, processes, services and business and/or organization models.					
20. The organization develops systematic processes for interdepartmental co-operation.					
21. The organization has well-defined routines for building and defining the tasks concerning the project teams.					
SYSTEMATIC LEARNING AND IMPROVEMENT					
22. The organization incorporates into its activities all the learning obtained.					
23. The organization has systematic devices for adopting good practices.					
PROTECTION AND ASSESSMENT OF RESULTS					
24. The organization has defined processes for evaluating and deciding on the protection and assessment of its intellectual capital and the results of RDI activities.					