



BALANCE BETWEEN OPENNESS AND CLOSENESS OF ORGANIZATIONAL BOUNDARIES IN FACILITATING OPEN INNOVATION

BHARATH KALAYANASUNDRAM RAMESH

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Bharath Ramesh

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ISEP – School of Engineering
Masters in Mechanical engineering



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Dissertation presented to ISEP – School of Engineering to fulfill the requirements necessary to obtain a Master's degree in Mechanical Engineering, carried out under the guidance of Luis Pinto Ferreira, Professor at Instituto Superior de Engenharia do Porto and Teresa Dieguez, Professor at ISCAP (Instituto Superior de Contabilidade e Administração do Porto)

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JURY

President

Francisco José Gomes da Silva, Professor Adjunto, Departamento de Engenharia Mecânica, Instituto Superior Engenharia do Porto.

Supervisor

Luís Carlos Ramos Nunes Pinto Ferreira, Professor Adjunto, Departamento de Engenharia Mecânica, Instituto Superior de Engenharia do Porto.

Second supervisor

Teresa Maria Leitão Dieguez, Professor at ISCAP (Instituto Superior de Contabilidade e Administração do Porto).

Examiner

Oscarina Susana Vilela da Conceição, Professor Adjunto, Instituto Politécnico do Cávado e do Ave.

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KEYWORDS

Innovation, Open Innovation, Closed Innovation, Textile Industry, Collaboration, Portugal

ABSTRACT

The need of open innovation emerged from the organizational worldwide competitiveness and the need of being always improving and innovating, in order to be sustainable and add value. Organizations face new challenges and must present solutions for them. Frequently their assets inside house are not enough, but can be a precious key for joining efforts with external players and get better performance. Open innovation is about working with outside partners (namely suppliers, clients, competitors, etc) to market inside advancements and get a wellspring of outer development that can be popularized. Through the contextual analysis examination of the Clothing and Textile industry in Portugal, this dissertation aims to contribute for the reflexion of conceiving and keep up a dynamic harmony amongst openness and closeness of open innovation. Developed in INESC TEC, a private non-profit association that hosted the researcher of this dissertation, this study is mostly qualitative. By interviewing some of the top authority players from the textile sector in Portugal, the dissertation's findings suggest that open innovation is a combined model which involves Government, Universities, Research Centres, Associations and Enterprises (SME and big companies). It requires a symbiosis between closed and open processes, where all players should act, interact, collaborate and cooperate. This case shows how large-scale firms and SME firms tend to see open innovation and how they objectify it. It also presents one possible way of being a successful open innovator by combining open and closed features. What to share, how to value the process and its effects and what are the benefits of sharing are some of the key questions answered.

This dissertation concludes that open innovation requires action and will have more impact if worked in a cluster's approach, by all the player, even if in different levels and approaches.

PALAVRAS CHAVE

Inovação, Inovação aberta, Inovação fechada, Indústria têxtil, Colaboração, Portugal.

RESUMO

A necessidade da inovação aberta resultou da competitividade das organizações a nível mundial e da necessidade de as empresas estarem sempre a melhorar e inovar, de forma a ser sustentáveis e acrescentar valor. As empresas enfrentam novos desafios e precisam de apresentar soluções para esses desafios. Muitas vezes os seus ativos internos não são suficientes, mas podem ser uma chave preciosa para reunir esforços com atores externos e obter melhor desempenho. A inovação aberta está relacionada com o trabalho a desenvolver com os parceiros externos (nomeadamente fornecedores, clientes, concorrentes, etc) para responder às exigências do mercado e, ao mesmo tempo, receber uma “lufada de ar fresco” sobre o desenvolvimento que está a ser conduzido no exterior da empresa. Através de uma análise contextual da indústria de Roupas e Têxteis em Portugal, esta dissertação procura contribuir para que se reflita sobre a necessidade de conceber e criar uma dinâmica harmónica entre inovação aberta e fechada. Desenvolvida no INESC TEC, Instituição que acolheu o investigador, este estudo é, sobretudo, qualitativo. Através de entrevistas feitas a alguns dos mais relevantes atores da Indústria Têxtil em Portugal, os resultados desta dissertação sugerem que a inovação aberta é um modelo combinado que envolve o Governo, as Universidades, os Centros de Investigação, as Associações e as Empresas (PME’s e Grandes empresas). Requer uma simbiose entre processos abertos, onde todos os atores devem atuar, interagir, colaborar e cooperar. Este caso mostra como é que as grandes empresas e as PME’s tendem a ver a inovação aberta e como é que a objetivam. Apresenta, ainda, um possível caminho para se tornar um inovador aberto de sucesso, através da combinação de especificidades abertas e fechadas. O que partilhar, como valorizar o processo e os seus efeitos, bem como os benefícios da partilha são algumas das questões-chave que são respondidas neste estudo. Esta dissertação conclui que a inovação aberta exige ação e terá maior impacto se for trabalhada numa abordagem de cluster, por todos os atores, mesmo que em diversos níveis e abordagens.

LIST OF SYMBOLS AND ABBREVIATIONS

List of Abbreviations

Term	Designation
ATP	Association of Textile in Portugal
INESC TEC	Institute for System and Computer Engineering , Technology and Science
IP	Intellectual Property
MNE	Multi - National Enterprises
OI	Open Innovation
SME	Small and Medium Enterprises

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1.INTRODUCTION

1.1 Objectives

1.2 Company history synthesis

1.3 Methodology

1.4 Dissertation Organisation

1 INTRODUCTION

The need of open innovation emerged with the improvement of development jugged business condition where organizations have restricted assets to fulfil their advancement needs inside houses (Molnar, 2010). The focal thought behind open development is that, in a universe of broadly appropriated information, organizations can't stand to depend totally all alone research, however ought to rather purchase or permit procedures or innovations (i.e. licenses) from different organizations. Furthermore, inner developments not being utilized as a part of a company's business ought to be taken outside the organization (Chesbrough, 2003)

Open Innovation encourages the association to join outside and inward thoughts to execute in the market with the goal that they can enhance their innovation and they can decrease the cost. SMES likewise directed to utilize open development yet they are less dynamic contrasted and substantial firms (Molnar, 2010). The lion's share of studies has concentrated on considering OI in multinational organizations (MNCs), however our insight into OI in little and medium-sized undertakings (SMEs) is as yet divided (Vrande, *et al.*, 2009). Albeit late examinations have researched SMEs in numerous specific situations, because of the many-sided quality and broadness of the idea of OI, incorporating different advancement exercises, there have been significant difficulties in the estimation of OI (Podmetina *et al.*, 2014). This made it troublesome for specialists to cover the full OI range. As of not long ago, inquire about concentrate has been on OI intermediaries as opposed to OI itself, for example, data seek broadness and profundity (Laurson & Salter, 2006), innovation sourcing and exploring or between authoritative systems. These intermediaries are absolutely essential markers of OI exercises, yet they speak to a somewhat engaged and conceivably restricted translation of OI appropriation, impeding an entire comprehension of OI approaches.

Research demonstrates that open innovation is required in associations to build up their business with their constrained assets to fulfil inside houses. Truth be told, in a universe of sharp changes, associations can't totally rely on upon their own particular research: they need to purchase or to permit procedures or creations from different organizations. This leads associations to join outside and inward arrangements keeping in mind the end goal to execute them in the market, keenly investigating their business and lessening expenses and time.

1.1 Objectives of the Dissertation

The main objectives of this Dissertation are the following:

- It demonstrates how large-scale firms and SME firms tend to see open innovation how they actualize it.
- To present one possible way of being a successful open innovator by combining open and closed features.
- Answers the key questions of what to share, how to value the process and effects of sharing.
- How to develop an efficient collaborative strategy
- Collaborative strategy between Portugal and India

1.2 Company history synthesis

The Institute for Systems and Computer Engineering, Technology and Science (INESC TEC) is a research & development institute located on the campus of the Faculty of Engineering of the University of Porto (Portugal). INESC TEC is a private non-profit association, recognised as a Public Interest Institution and has been an Associate Laboratory since 2002. The purpose of INESC TEC is to act as an interface between the academic world, the world of industry and services and the public administration in Information Technologies, Telecommunications and Electronics (ITT&E). INESC TEC invests in Scientific Research and Technological Development, as well as in Advanced Training and Consulting, Technology Transfer and supports the Establishment of new Technology-based Companies (INESC TEC, 2017). The figure 1 shows the INESC TEC logo.



Figure 1 - INESTEC Logo.

Present in 6 sites in the cities of Porto, Braga and Vila Real, INESC TEC incorporates 12 R&D Centres and one Associate Unit with complementary competences, always looking to the international market. INESC TEC brings together more than 800 researchers, of

which around 300 have PhDs (250 integrated PhDs in 600 researchers). INESC was founded in the city of Porto in 1985, and in December 1998 it became INESC Porto, a branch of INESC. Following a rebranding process, the institution changed its name to INESC TEC, with INESC, the University of Porto Foundation and the Polytechnic Institute of Porto. In 2012, INESC TEC signed a protocol with the University of Minho. INESC TEC's complex in Minho is called HAS Lab – High Assurance Software Laboratory. In 2012, the University of Trás-os-Montes e Alto Douro (UTAD) also became a privileged partner of INESC TEC. With the launching of INESC P&D Brazil (in São Paulo, Brazil), INESC TEC has strengthened its presence worldwide, always associating Portugal to international scientific excellence. Coordinated by INESC Porto, INESC TEC is one of Portugal's most influential research institutes with developments in areas such as health, renewable energies, enterprise systems, artificial intelligence, robotics, applied photonics, information systems and high-assurance software. In 2011, the Portuguese Navy joined efforts with the institute to develop technology for deep sea research and surveillance in order to monitor Portugal's Exclusive Economic Zone, the INESC TEC building shown in figure 2.

Among the people who work at INESC TEC are some of the most influential researchers both in Portugal and worldwide, such as José Carlos Príncipe, who won the 2011 IEEE Neural Networks Pioneer Award. In 2013, Vladimiro Miranda was awarded with the IEEE Power & Energy Society Ramkumar Family Renewable Energy Excellence Award 2012 by the prestigious Institute of Electrical and Electronics Engineers. In December 2012, INESC TEC presented the Laboratory of Smart Grids and Electric Vehicles, which was the result of project REIVE (Smart Grids with Electric Vehicles). This is an unparalleled infrastructure in the world and places Portugal at the forefront of smart grids worldwide. Provided with an experimental component that is unique, this laboratory makes it possible to test, in an environment that is very close to a real environment, new solutions that integrate microgeneration units and electric vehicles in Low Voltage grids. INESC TEC conducts research in the following clusters like Power and Energy, Computer Science, Industry and Innovation, Networked Intelligent Systems (INESC TEC, 2017).

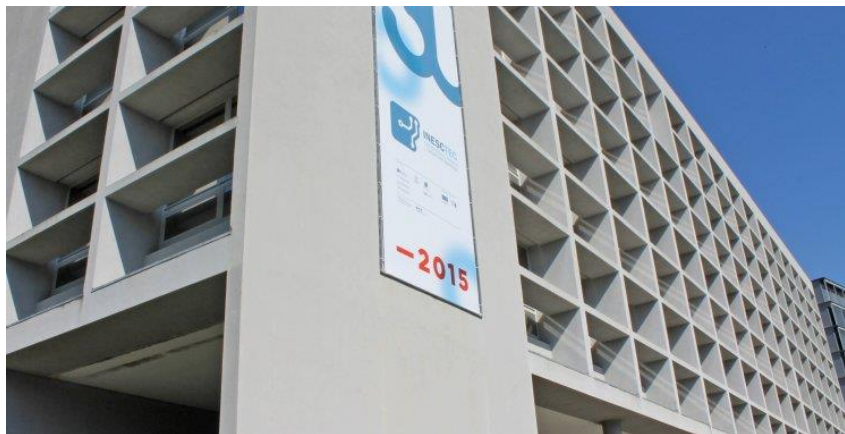


Figure 2 - INESTEC Building.

1.3 Methodology

The philosophy and the choice of strategies were produced around the principle points of the investigation. There were four primary techniques: writing audit, meetings, review and conclusion is explained in table 1.

LITERATURE REVIEW	<ul style="list-style-type: none"> • Open Innovation and its activities, Key Literature, Concepts and Practices
INTERVIEW	<ul style="list-style-type: none"> • Meetings directed in light of Innovation scoring survey
SURVEY	<ul style="list-style-type: none"> • Results are produced in view of the meetings
CONCLUSION	<ul style="list-style-type: none"> • Future work

Table 1 - Analysis of Methodology.

For the recognizable proof of open development exercises, we utilized the overview technique, by building a organized poll, appropriated for circumstances where the questioner is absent or at the point when is important to put more exact inquiries (Hill & Hill, 1998). The conveyance and gathering techniques for these surveys were broke down - the electronic mail (email) was the favoured correspondence channel utilized. In this sense, we additionally utilized the email and direct meeting in the research. The survey included shut inquiries, mostly accelerating the reaction procedure and empowering better consistency and rearrangements in the examination of the reactions (Almeida & Pinto, 1995). The few open inquiries presented in the survey were intended to empower a more various social occasion of data and recognize different issues not secured by the shut inquiries. Prior to the poll was discharged, we directed a pre-test (Hill & Hill, 1998), testing the sort of inquiries, their importance, unequivocally, the request of the inquiries and the extent of the poll. This pre-test was directed among comparable elements that have a place with the bunches (i.e., Technology Centre, University, SME, Organization). The proposals have been investigated and enhancements presented in the last form of the poll.

The survey had eight squares of inquiries is explained in table 2.

AREA
<ul style="list-style-type: none"> • Interviewer's biography data
<ul style="list-style-type: none"> • Institute Information
<ul style="list-style-type: none"> • Introduction
<ul style="list-style-type: none"> • Innovation
<ul style="list-style-type: none"> • Path to open innovation
<ul style="list-style-type: none"> • How to be open
<ul style="list-style-type: none"> • Sharing and protecting
<ul style="list-style-type: none"> • SME (Small and Medium enterprises)

Table 2 - Survey of Enquiries.

The table 3 explains the structure of questionnaire.

AREA	MAIN QUESTIONS
<ul style="list-style-type: none"> Interviewer's biography data 	<ol style="list-style-type: none"> Age Gender Positioning in the company
<ul style="list-style-type: none"> Institute Information 	<ol style="list-style-type: none"> Sector Turnover % of exports Main export markets
<ul style="list-style-type: none"> Introduction 	<ol style="list-style-type: none"> Tell me about Portugal, Textile and Clothing Industry all over the world and Portugal, Portugal Market, Economic Relation of Portugal Where are you coming from, previous experiences, previous workplaces Do you like to work on this sector Do you think textile sector has more opportunities than other activity sector Tell me about the future of textile and clothing industry What do you think and mean about innovation
<ul style="list-style-type: none"> Innovation 	<ol style="list-style-type: none"> Do you think innovation is important in textile and clothing sector? Tell us how important is? How do you feel, does your institute guarantee enough place for innovative ideas? Tell us some of impediments to innovation in your organization How has innovation become engrained in your organization culture and how is it being optimized What technologies, business model and trends will drive the biggest changes in your institute over the next two years Can you share a specific innovation strategy you have recently encountered which you find compelling. Does your institute promote innovative ideas coming from outside? For example, from your customers, users, universities, other companies... According to your opinion, what are the most important institute features in order to be a successful innovator in the 21st century
<ul style="list-style-type: none"> Path to open innovation 	<ol style="list-style-type: none"> What is driving open innovation in your institute Which issues on open innovation are the most pressing right now at your institute Where do you see open innovation in your institute five years from now How do you define open innovation at your institute In which business functions do you have the most open innovation activity in your institute Are you satisfied with this new innovation philosophy What is the biggest opposite between the old and new innovative thinking

<ul style="list-style-type: none"> • How to be open 	<ol style="list-style-type: none"> 1. Being open means gaining more innovative ideas either from inside or outside the company, this could lead to more innovations. According to your opinion, what does being open mean for your institute 2. Do you regard your company open 3. What got you to work with open innovation. 4. Do you believe cultural differences have an impact on open innovation 5. What advice would you give to an innovation leader who has been put in charge of driving open innovation in your institute 6. I believe the future of innovation is open and global. If you agree, what advice would you give to people aspiring to build a career within innovation
<ul style="list-style-type: none"> • Sharing and protecting 	<ol style="list-style-type: none"> 1. Do you regard your company protective 2. How does your company protect its innovative ideas 3. Are you satisfied with this protection 4. If your company tries to open up to the outside world, how do you protect your innovative ideas at the same time 5. How does your company ensure the place for both sharing and protecting 6. Do you think it is possible to have both protective and collaborative innovation philosophy at the same time 7. Which do you think is more important now, being open to everyone, or protecting ideas from competitors.
<ul style="list-style-type: none"> • SME (Small and Medium enterprises) 	<ol style="list-style-type: none"> 1. Why should small companies embrace open innovation. 2. What are the benefits of innovating together with others for small companies 3. Open innovation is very much about ecosystems with several partners. Small companies often take the back seat in such setups. Is this a problem 4. There is a view that small and medium scale industry are not suitable for open innovation 5. In my point of view open innovation is much needed in small and medium scale industry what is your view

Table 3 - Structure of Questionnaire.

For scattering and appropriation of the survey, we reached (by phone and email) the administration structures of each Cluster, depicting the idea of the survey, asking for their collaboration to disperse the poll to every one of its individual.

1.4 Dissertation Organisation

The structure of the report is presented in table 4.

FIRST CHAPTER	Information about the Introduction, Open Innovation and Organization.
SECOND CHAPTER	Manages the Literature Review where a tremendous research is made about the Open Innovation field and its practices.
THIRD CHAPTER	Manages viable work done and the studies directed among the representative's top official of textile field.
FOURTH CHAPTER	Manages with the conclusion, results and future work.
FIFTH CHAPTER	Manages with the reference and website
FINAL CHAPTER	Contains the questionnaire interviewer results used for the survey (APPENDIX)

Table 4 - Structure of Report.

2.LITERATURE REVIEW

2.1 The Concept of Innovation

2.2 Open Innovation

2.3 Open Innovation Model

2.4 Open Innovation Strategy

2.5 Advantages and Disadvantages of Openness

2.6 Closed to open Innovation

2.7 Innovation in Sme

2.8 Open Innovation in SME

2.9 Points of View of open Innovation to SME Context

2 LITERATURE REVIEW

2.1 The Concept of Innovation

An innovation is the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organizational method in business practices, workplace organization or external relations (Oslo Manual, 2005). The minimum requirement for an innovation is that the product, process, marketing method or organizational method must be new (or significantly improved) to the firm. However, it is important to distinguish between invention and innovation as 'innovation' is actually the introduction on the market of a new product, process or system, whereas 'invention' is only its discovery and creation (Marques & João 2014). Innovation activities are all scientific, technological, organizational, financial and commercial steps which actually, or are intended to, lead to the implementation of innovations. Innovation activities also include R&D that is not directly related to the development of a specific innovation. Innovation is crucial for today's market, as being innovative and creative are important key and capabilities for having and keeping competitive advantages.

Innovation advances through the innovative effort that is developed within society and the economy, where all kind of actors may act, namely firms, government, non-profit institutions or universities (Caraça, *et al.*, 2009). Innovation defines four types of innovation: product innovation, process innovation, marketing innovation and organizational innovation, table 5 explains the types of open innovation.

INNOVATION	CONTENT
PRODUCT INNOVATION	<ul style="list-style-type: none"> • Good or service that is new or significantly improved with respect to its characteristics or intended uses • Significant improvements in technical specifications, components and materials, incorporated software, user friendliness or other functional characteristics. • Utilize new knowledge or technologies, or can be based on new uses or combinations of existing knowledge or technologies
PROCESS INNOVATION	<ul style="list-style-type: none"> • Implementation of a new or significantly improved production or delivery method. • Significant changes in techniques, equipment and/or software • Intended to decrease unit costs of production or delivery, to increase quality, or to produce or deliver new or significantly improved products
MARKETING INNOVATION	<ul style="list-style-type: none"> • Implementation of a new marketing method involving significant changes in product design or packaging, product placement, product promotion • Addressing customer needs, opening up new markets, or newly positioning a firm's product on the market, with the objective of increasing the firm's sales
ORGANIZATIONAL INNOVATION	<ul style="list-style-type: none"> • Implementation of a new organizational method in the firm's business practices, workplace organization or external relations. • Intended to increase a firm's performance by reducing administrative costs or transaction costs, improving workplace satisfaction (and thus labour productivity), gaining access to non-tradable assets (such as non-codified external knowledge) or reducing costs of supplies

Table 5 - Types of Innovation (OSLO MANUAL, 2005).

Innovation results from an idiosyncratic and unpredictable chain of action and feedbacks, table 6 explains the innovation results.

INNOVATION RESULTS
<ul style="list-style-type: none"> • Firm's well tried, tested and trusted business routines
<ul style="list-style-type: none"> • Efforts to deviate from its own track record
<ul style="list-style-type: none"> • Signals and responses of its relevant techno-economic environment

Table 6 - Innovation Results (Caraça, *et al.*, 2007)

"Everyone knows that innovation is a core business necessity and Companies that don't innovate, die" (Chesbrough, 2006). Innovation is crucial to survive, but innovation management depends critically from Creating interfaces and Managing interfaces.

These interfaces are formed and explained in table 7.

INNOVATION INTERFACE
<ul style="list-style-type: none"> • Technological awareness: systematic observation of external developments
<ul style="list-style-type: none"> • Technological cooperation: partnership activities with other institutions and organisations, with view of sharing technical and scientific information and jointly developing products and processes
<ul style="list-style-type: none"> • Technological scanning, monitoring and forecasting: systematic sensing of technological opportunities and efforts of futures research concerning the link between emerging technologies and new products
<ul style="list-style-type: none"> • New users: observation and analysis of potential customers and new markets
<ul style="list-style-type: none"> • Weak signal analysis: specialised perception of indicators of future change
<ul style="list-style-type: none"> • Intellectual property: using the possibilities of the intellectual property regime to protect, assimilate and disseminate ideas
<ul style="list-style-type: none"> • Internal creativity: procedures that leverage strategic awareness of opportunities and threats to the firm
<ul style="list-style-type: none"> • Innovation-friendly governance: organisational structure that favours innovation
<ul style="list-style-type: none"> • Organisational capabilities: strategic conception of organisational structures that favour innovation
<ul style="list-style-type: none"> • Knowledge management: generation, validation, codification and diffusion of in-house knowledge

Table 7 - Innovation Interface (Caraça, *et al.*, 2007).

Innovations are a key source of a competitive advantage that determines the economic success of each organisation. This means that a specific innovation can no longer be seen as the result of predefined and isolated innovation activities but rather as the outcome of a complex co-creation process involving knowledge flows across the entire economic and social environment. Open up the innovation process to all active players is the basic

premise of open innovation: knowledge can circulate more freely and be transformed into products and services that create new markets, fostering a stronger culture of entrepreneurship (European Commission, 2016).

2.2 Open Innovation

Innovations are a key source of a competitive advantage that determines the economic success of each organisation. This means that a specific innovation can no longer be seen as the result of predefined and isolated innovation activities but rather as the outcome of a complex co-creation process involving knowledge flows across the entire economic and social environment is explained in table 8.

OPEN INNOVATION PARADIGM
<ul style="list-style-type: none"> Utilizing outside wellsprings of advancement, for example, clients, match organizations, and scholastic establishments
<ul style="list-style-type: none"> Adjustment in the utilization, administration, and work of licensed innovation as it is in the specialized and research driven era of protected innovation.
<ul style="list-style-type: none"> It is comprehended as the precise consolation and investigation of an extensive variety of inward and outside hotspots for creative open doors,
<ul style="list-style-type: none"> The incorporation of this investigation with firm abilities and assets, and the abuse of these open doors through various channels.

Table 8 - Open Innovation Paradigm (West & Gallagher, 2006).

2.3 Open Innovation Model

Open innovation is the use of “purposeful inflows and outflows of knowledge to accelerate innovation internally while also expanding the markets for the external use of innovation” (Chesbrough, 2006). This original notion of open Innovation was largely based on transferring knowledge, expertise and even resources from one company or research institution to another. This undertakes that firms can and should use external ideas as well as internal ideas, and internal and external paths to market, as they seek to expand their acting (European Commission, 2016). Open innovation is grounded in the recognition that firms can harness knowledge from multiple sources to enhance innovation and thus deliver additional value for customers. When rely on open innovation model, company does not drive to generate good ideas entirely by itself. It seeks to utilize internal and external ideas in a good manner, to be more effective at managing cost and risk and to accelerate technology development (Hippel, 1988). The model involves strategic, managed exchanges of information with actors outside of the boundaries of an organization, aimed at integrating their resources and knowledge into the organization own innovative process. Open innovation provides organization reduces cost in implementing R&D, it increases product development, incorporation of

customers in the development process, increase the value for market research and customer improvement, bonding between internal and external innovations improve.

As a consequence, business adopting this innovation model need to engage in proactive intellectual property management in order to exploit their own and other firm's knowledge and innovation in a strategic manner (Herzog, 2008). The IPRs use, whether registered rights such as patents, unregistered rights such as trade secrets, is crucial to clarify ownership and control over resources that will be shared in the context of collaboration. Firms establish knowledge management processes to ensure that expertise is shared outside the firm in a managed and strategic way is explained in figure 3.

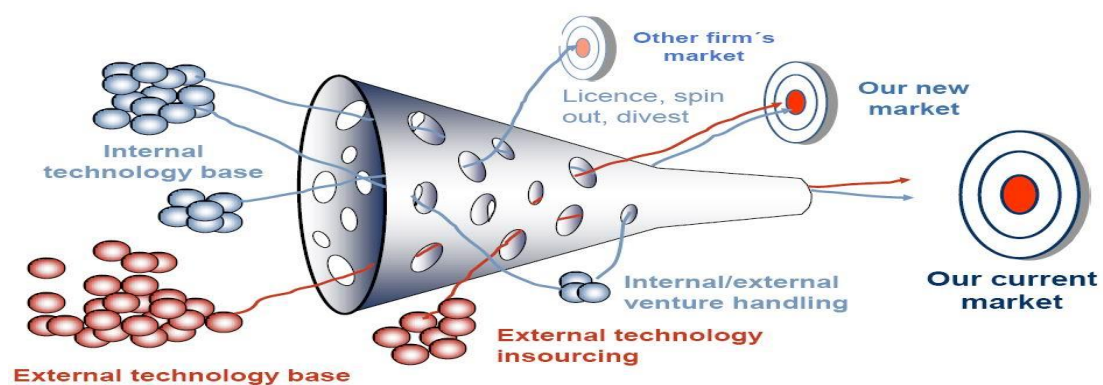


Figure 3 - Open vs Closed innovation (Chesbrough, 2003).

In a closed innovation model, firms try to internalize their firm-specific R&D activities and commercialize them through internal development, manufacturing and distribution processes (Chesbrough, 2003). Companies aiming to utilize the benefits of this innovation model are trying to secure core technologies and talents by investing large amounts of money in R&D activities. These companies often characterized by the "not invented here syndrome (NIH)," which describes a corporate culture that avoids using external technologies and are reluctant to cooperate with others (Chesbrough, 2006)

Open innovation is identified by three models, is explained in table 9.

INBOUND	OUTBOUND	COUPLED
The use within a firm of external source of innovation.	The use of external pathway for the purpose of developing and commercializing innovation	Combines the inbound and the outbound dimensions, rather than sharing existing resources and expertise, firms work together to develop new knowledge and solution
Firm may in-licence a technology elsewhere, integrating that component into its own technology solution rather than seeking to develop an equivalent in-house.	Firm may out-license its product to another firm that can help to further develop the product for instance by obtaining necessary regulatory approvals.	This type of collaboration can involve close integration a joint venture, or a looser affiliation such as engagement through an innovation competition.

Table 9 - open innovation model (Chesbrough, 2006), (Gassmann & Enkel, 2004).

Firms may adopt open innovation for defensive reasons, that is, to manage and reduce costs and risks associated with product development. More frequently, they collaborate for offensive reasons, that is to proactively leverage innovation and knowledge from outside the firm in order to improve their own offerings and stay ahead of competitors (Chesbrough, 2006). Companies have always integrated knowledge from outside of their boundaries into their product development to some extent (Pénin *et al.* 2011). In the real economy, the distinction between open innovation models and the traditional “closed” approach to innovation, described below, is not as clear-cut as sometimes presented. In fact, businesses frequently employ hybrid approaches (Dahlander & Gann 2010). Innovation can be thought of as a continuum of openness rather than a stark choice between closed and open. A key feature of the open innovation model is its flexibility. There are different forms that companies can use to pursue this innovation model, including bilateral collaboration, networks, and innovation “ecosystems” in which participants retain their knowledge and collaborate informally. These channels generally depend on clear, predictable IP arrangements. Other activities include incubation, as well as spin-offs or spin-ins and crowdsourcing (Chesbrough, 2006; Péning *et al.*, 2011).

2.4 Open Innovation Strategy

In the present business condition, enhancing in an open way is considered as the key of keeping up upper hand. Since the accomplishment of open advancement extraordinarily relies upon the organization's plan of action and its operation, the field of business methodology likewise ends up noticeably pertinent. The disclosure of imaginative people, inventive groups or communitarian activities as powerful wellsprings of advancement requires the presence of an open business procedure and open plan of action. As indicated by the customary business systems the fundamental point of organizations is to create aggressive positions against their rivals and to suggest

adequate boundaries to secure inner sources (Chesbrough & Appleyard, 2007). All these conventional perspectives are fundamentally based upon possession and control as the primary wellsprings of vital achievement, by centring basically inside the firm and deliberately overlooking outer factors as conceivable wellsprings of advancement. However, these customary business systems don't take the potential estimation of outer assets into thought, outside assets, for example, imaginative groups, volunteer supporters or encompassing systems speak to developing wellsprings of significant worth creation. Keeping in mind the end goal to construct an open plan of action, there are essential advances that organizations need to consider. To make an adequately working open plan of action, organizations should change their key view, and they should open up their limits. As the porousness of organization fringes expands, organizations turn out to be more open to outer creative thoughts and advances. In huge organizations, open development identifies with purchasing or offering scholarly properties, while littler organizations are described with less IP purchase or offer. Freely from the organization measure, organizations need to open up their development procedures and let outside imaginative thoughts stream in and unused advances to stream out of the organization. There are various approaches to open up the firm limits.

Since clients are critical wellsprings of inventive thoughts, organizations can expand their transparency by putting accentuation on their clients. Customization, the utilization of client toolbox's and the making of client groups are regularly said as compelling methods for new administration improvement. This alleged association introduction procedure requires many changes in the structure of an association, as clients practice tremendous impact on particular of administrations they require. Fulfilling client needs is ending up progressively fundamental to new business methodologies. The degree introduction system additionally turns increasingly towards another way, consolidating institutionalization with client interests through the methods for mass customization. All things considered, both of these techniques stay in foundation contrasted with the association introduction system, which is alluded to as an exemplification of the present customer centred patterns. The motivation behind why this technique increased such a focal part in the present administration and creation areas can be comprehended as the consequence of current market advancements. In a business situation where client needs are in the essential concentration, where advancement is driven by clients themselves and where client groups give the most critical concentrated stages of advancement and improvement, this methodology gives the main plausibility to firms to stay powerful against their rivals. The fundamental element of this methodology is that it gives high flexibility for singular clients to take part, making it the best strategy to give the most noteworthy included esteem, by including clients themselves into development forms. However, organizations can for the most part advantage from expanding buyer inclusion, this procedure likewise builds the requirement for supporting buyers, which requires extra

endeavours and basic modifications from the given organizations. Necessitates change in the association structure, as well as activities social forming outside the organization, as the need and expenses of client support can be adequately diminished by making client groups. In these firm-settled client groups shopper to-buyer collaboration can encourage critical thinking in the purchaser space, can help the dispersion of toolbox related information, and conceivably upgrade the results delivered by the toolbox approach. Another noteworthy wellspring of outside thoughts is to keep up cosy association with colleges. Employees are more often than not the best specialists of given fields, having the capacity to serve valuable data to organizations.

2.5 Advantages and Disadvantages of Openness

Since R&D is turning out to be all the more exorbitant and profits for it are diminishing a result of the continually reinforcing rivalry, open methodologies increase much greater fame. A simple and viable method for moving organizations to advance transparently is to gather the primary preferences and advantages that can be somewhat clarified by the genuine choice approach

In this better approach for advancement genuine choices imply that each firm can choose whether or not outer and inward information is significant to be further formed and marketed into another business (Vrande, *et al.*, 2009). In this unique circumstance, genuine alternatives are comprehended as instruments for instability diminishment, permitting organizations to make a choice and hold up until the vulnerability about the given open door has diminished. Afterward, when this has happened, each organization can choose whether to put resources into the new advancement or prematurely end the venture (Adner & Levinthal, 2004; McGrath & Nerkar, 2004). One of the primary favourable circumstances of open innovation in "hazard loaded" exercises is that organizations can profit by the early contribution in new advances or business openings (Vrande, *et al.*, 2009).

This early inclusion by taking an interest in investment finances or giving instructive interests in promising ventures at colleges or research labs all improve the capability of genuine choice, since organizations can check an expansive scope of intriguing thoughts and tasks. Developing firms can likewise profit by postponed passage or deferred budgetary duty having the chance to begin their advancement from outside by means of outer sources. This capacity to defer the inner advancement exercises underpins the entire development handle by making it quicker and simpler. Another favourable position of open innovation is that it makes the likelihood of an early exit and the capacity to understand some an incentive from tasks that don't go ahead inside (by being authorized or sold).

Next to the choice of early leave, open advancement permits firms to profit by deferred exit also. Through the outer assets firms can screen their improvements while deferring the leave choice. In spite of the fact that the firm chooses not to proceed with the wander, despite everything it can profit by postponed exit and developed control (Vrande, *et al.*, 2009). However open advancement offers various potential favourable circumstances, these advantages don't emerge consequently; organizations need to learn new abilities and schedules to successfully use them. Since open advancement requires porous firm limits and the capacity to work together, persuading people to produce and contribute their IP is apparently the greatest administrative test. Keeping in mind the end goal to successfully rouse the era and commitment of outer learning chiefs need to give adequate structure and stage to commitment.

Open innovation offers several benefits to companies and naturally associated with a number of risks and challenges, explained in table 10.

ADVANTAGES OF OPENNESS	DISADVANTAGES OF OPENNESS
<ul style="list-style-type: none"> • Diminished cost of leading innovative work 	<ul style="list-style-type: none"> • Probability of uncovering data not planned for sharing
<ul style="list-style-type: none"> • Potential for development being developed efficiency 	<ul style="list-style-type: none"> • Potential for the facilitating association to lose their upper hand as a result of uncovering licensed innovation
<ul style="list-style-type: none"> • Fuse of clients right on time in the advancement procedure 	<ul style="list-style-type: none"> • Expanded intricacy of controlling development and managing how donors influence a venture
<ul style="list-style-type: none"> • Increment in precision for statistical surveying and client focusing on 	<ul style="list-style-type: none"> • Conceiving a way to appropriately recognize and consolidate outside development
<ul style="list-style-type: none"> • Potential for synergism amongst inside and outside developments 	<ul style="list-style-type: none"> • Realigning development methodologies to stretch out past the firm keeping in mind the end goal to amplify the arrival from outside advancement

Table 10 - Advantages and Disadvantages of openness (West & Gallagher, 2006).

2.6 Closed to open Innovation

Open improvement as another alternative to customary inward headway in gigantic associations. He depicts OI as some strategies for commercializing inside and external musings by virtue of internal and outside devices. "In this new model of open improvement, firms promote external (and furthermore internal) considerations by

sending outside (and likewise in-house) pathways to the market" (Chesbrough, 2003). As a result, associations were constrained to find new courses for upgrading incorporate that ownership, section hindrances, trading costs besides, intra-industry conflict were of extraordinary essentialness in close improvement, while they are discretionary things inside OI; by the day's end, closed and open advancement show basic non-differentiations (Chesbrough & Appleyard, 2007).

The above talk shows that we consider Chesbrough's definition from before to be considered as if a firm is using OI in case they are open in a manner of speaking one or two or three sections of their advancement works out. In this examination we connect with this view explained in table 11.

CLOSED INNOVATION	OPEN INNOVATION
Elite utilization of inward R&D	Utilization of inside and outside R&D and developments – relating to the specific plans of action Openness to outer plans of action
Innovation designed, ensured, created, conveyed to the market and circulated by a similar organization	Assortment of IP generators and teammates – other organizations, state funded colleges and R&D foundations, clients, clients, providers
Full inside control of the innovation from Research to Development to Customer	Dynamic IP resource administration of the companies' portfolio –matching advancements with creative (inside or outside) plans of action to increase the value of IP
Innovation abused just through inside plan of action	More proactive affirmation of IP approach
IP generators of new innovations –mainly organizations	Improvement of Intermediate IP Markets – semiconductors, biotechnology, chemicals and purchaser items and Innovation Intermediaries (facilitators)
IP barrier to section not wellspring of income	Utilization of more mind-boggling IP valuation strategies –such as "Genuine Option"–imposed by exceptionally escalated and expanded IP commercialization models – reassignment of the IP to various accomplices amid its lawful life, offering/purchasing, permitting (to organizations or new businesses)
Gigantic IP non-performing portfolios Organizations normally offering yet not purchasing IPRs (advantage –no perplexity about IP possession), Absence of IP advertise	IP - a benefit which can (and should) be overseen through a satisfactory plan of action keeping in mind the end goal to build esteem and turn into a solid wellspring of income.

Table 11 - Difference between closed and open innovation inspired from Contrasting principles of closed and open innovation (Business Models of Innovation - "closed innovation" and "open innovation", 2011).

There is a high self-reliance level in closed innovation; for instance, discovering, developing, shipping, commercializing, creating, are actions that should be conducted

in-house in an extreme closed innovation setting. On the contrary, an extreme open innovation setting advocates actions taken in-house, as well as, externally to cope with current products and technologies complexity (Chesbrough & Appleyard, 2007). In other words, OI is about tapping into knowledge of experts outside companies to complement for companies' internal knowledge; balancing internal and external R&D; taking advantage of others' discoveries; carefully thinking business model instead of being first on the market; balancing internal and external ideas; taking advantage of others' use of owned IP and taking advantage of others' IP when it embraces companies' business model (Chiaroni, *et al.*, 2010; Enkel *et al.*, 2009; Pontiskoski & Asakawa, 2009). Thus, we can extrapolate that companies also evolve between these two extremes. That is basically every firm is involved in OI to some extent, even if most firms are involved to a very low degree.

2.7 Innovation in SME

As the conventional scale points of interest of expansive, interior R&D labs in built up organizations disintegrate, open advancement perceives that littler firms take a more conspicuous part in the contemporary advancement scene. (Chesbrough, 2003) gives prove that little (firms with under 1000 representatives) constantly expanded their offer of aggregate mechanical R&D spending in the US amid the last two decades. All the more particularly, little firms represent around 24% of all US industry spending in 2005 – contrasted with 4% out of 1981. The bigger firms with more than 25.000 workers were as yet in charge of 38% of aggregate industry R&D spending in 2005 contrasted with 71% out of 1981 (National Science Foundation, 2006). Subsequently, despite the fact that extensive organizations are as yet assuming an unmistakable part in advancement, littler firms are ending up progressively vital for industry R&D and along these lines for monetary development. Innovation in SME is categorized in two ways are explained in table 12.

CATEGORIZED	CONTENT
INDUSTRY	<ul style="list-style-type: none"> • SMEs can be separated in various ways, yet an intriguing division is the division amongst administrations and assembling firms. These factors influencing the development potential contrast significantly between these two gatherings of firms. Consequently, one can expect that diverse measurements of open development likewise will shift between administrations and assembling firms. Customarily, the significance of shut advancement was fundamentally featured for mechanical firms. • These organizations could profit by shut development in light of the fact that the in-house improvement and commercialization of their items was the main way to guarantee that they would profit by the innovations also. the expanding innovative many-sided quality to create new items, the short item life cycles, the versatility of architects and the ascent of the investment business have constrained these firms to open up their advancement forms. It is substantially simpler to outsource parts of the R&D procedure or to in-source new thoughts and advancements that fit the present business line.
MEASURE CLASSES	<ul style="list-style-type: none"> • Beside the way that SMEs are administrations or assembling firms, they additionally contrast essentially in measure. SMEs are characterized as firms with up to 500 workers. Nonetheless, there is as yet incredible distinction in the advancement techniques of little firms (up to 100 workers) and medium measured endeavors (100-499 representatives). The development procedures of bigger firms are commonly more organized and professionalized, and bigger firms commonly have a larger number of assets than little firms. • The vital suggestions for the utilization of open development in these organizations. Despite the fact that the utilization of interorganizational systems, the association of representatives and that of clients in the development forms is by all accounts similarly plausible for both little and vast SMEs, the degree to which SME organizations build up new pursuits as a piece of their open advancement methodology is probably going to rely upon firm size. Outsourcing of R&D and the turning out of new pursuits requires an organized and efficient advancement process.

Table 12 - Innovation in SME.

2.8 Points of View of open Innovation to SME Context

The depiction of MNEs and SMEs intrinsic attributes demonstrate to us the primary contrasts existing between them. Joining OI in MNEs and varying qualities amongst MNEs and SMEs, enable us to extrapolate on how difficult it can be for SMEs to manage OI. Subsequently, we introduce the aftereffects of this extrapolation. Some of our extrapolations are upheld by past investigations on certain edges of OI in SMEs. Because of an absence of research on OI in SMEs, different ones just depend on intrinsic qualities of SMEs. This examination reveals insight into the potential hindrances to maintain OI

that SMEs may experience the ill effects of, on account of their inborn qualities for a nittier gritty approach, (Dufour & Son, 2015). The spatial point of view: SMEs exercises and operations are represented by casual also, free strategies. Therefore, SMEs' condition is described as having a high level of implied learning (Teece, 2000). This hierarchical trademark is perceived just like an issue to cooperate with outer condition (Vrande, *et al.*, 2009), on the grounds that, with a specific end goal to be traded proficiently, data should be classified. To change implied learning into arranged learning requires human intercession and information on the most proficient method to systematize data through, for instance, learning administration frameworks. SMEs have restricted human asset to be distributed to and know how to grasp this change. Open innovation to SME context have different point of view are explained in table 13.

POINT OF VIEW	CONTEXT
AUXILLARY	<ul style="list-style-type: none"> SMEs are as of now familiar with distinguishing their center skills and outsourcing some R&D exercises. Furthermore, SMEs are now vigorously dedicated in teaming up through shaping organization together to share dangers, assemble integral capabilities and make collaborations. SMEs are prescribed to adjust their authoritative structure keeping in mind the end goal to maintain OI. Adjusting their structure enable SMEs to keep away from a potential hindrance.
CLIENT	<ul style="list-style-type: none"> Incorporating clients in the system is a prominent practice among SME. The level structure display in SMEs, and in addition, the natural structure encourages the early reconciliation of clients, because of their abnormal state of adaptability.
PROVIDER	<ul style="list-style-type: none"> SMEs must empower provider's initial combination in their system, since it decidedly influences the innovation procedure. It has been contended in the client viewpoint that SMEs have positive components to incorporate outside accomplices; therefore, by augmentation providers, too.
LEVERAGING	<ul style="list-style-type: none"> Absence of assets have dependably been compelled to search for coordinated effort with different associations keeping in mind the end goal to get to lacking advancements and consolidate them. SMEs are accustomed to checking their condition in journey for missing innovation and are utilized to not depending just on their inward R&D they need to change the procedures.
PROCESS	<ul style="list-style-type: none"> SMEs can't manage the cost of learning representatives due to an absence of monetary and HR. SMEs little client base prompts less input than with huge client base. Back to front process is probably going to occur in SMEs. Spearheading and entrepreneurial firms need to pitch their finding keeping in mind the end goal to broaden their assets pool.

TOOL	<ul style="list-style-type: none"> Absence of assets, SMEs can't bear the cost of the use of existing instruments, for example, learning administration frameworks and crowdsourcing stages. It is even more improbable that they create their own stages. Additionally, SMEs have little systems to help them.
INSTITUTIONAL	<ul style="list-style-type: none"> SMEs being spearheading, and entrepreneurial firms are prone to permit out advances with a specific end goal to acquire cash and therefore expand their assets pool. Be that as it may, permitting advancements requires earlier budgetary venture, which few SMEs can manage.
CULTURAL	<ul style="list-style-type: none"> Social mentality of SMEs is one of the fundamental components blocking open advancement usage. Since SMEs are entrepreneurial firms, authors are probably going to keep control on their firm also, be hesitant to reveal data about their disclosures.

Table 13 - Point of view of Open Innovation to SME Context (Vrande, *et al.*, 2009; Rundquist J., 2009; Gassmann & Enkel, 2004; Harhoff & Maximilians, 2003; Mogollon, *et al.*, 2010).

3.BALANCE BETWEEN OPENNESS AND CLOSENESS OF ORGANIZATIONAL BOUNDARIES

3.1 Research Methodology

3.2 Case Study : (Portugal Textile Sector)

3.3 Research Approach

3.4 Data Collection

3.5 Data Analysis

3.6 Interviewed Perspective about Questionnaire

3.7 Introduce Collaborative Efficient Strategy to Implement SME

3 BALANCE BETWEEN OPENNESS AND CLOSENESS OF ORGANIZATIONAL BOUNDARIES

3.1 Research Methodology

In the field of research, there are two general ways to deal with gathering and detailing data:

- QUALITATIVE
- QUANTITATIVE

The qualitative approach to research is focused on understanding a phenomenon from a closer perspective. The quantitative approach tends to approximate phenomena from a larger number of individuals using survey methods. Each approach has its advantages and disadvantages, that are portrayed in table 14.

QUANTITATIVE APPROACH	QUALITATIVE APPROACH
<p>The quantitative approach to gathering information focuses on describing a phenomenon across a larger number of participants thereby providing the possibility of summarizing characteristics across groups or relationships. This approach surveys a large number of individuals and applies statistical techniques to recognize overall patterns in the relations of processes. Importantly, the use of surveys can be done across groups.</p> <p>ADVANTAGES:</p> <ol style="list-style-type: none"> 1. Enables gathering information from a relatively large number of participant. 2. Can conduct in a number of groups, allowing for comparison. 3. Allows generalizing to broader population. 4. Provides numerical or rating information. <p>DISADVANTAGES:</p> <ol style="list-style-type: none"> 1. Difficulty in recognizing new and untouched phenomena 2. Caution in interpretation without a control group 	<p>The qualitative approach to gathering information focuses on describing a phenomenon in a deep comprehensive manner. This is generally done in interviews, open-ended questions, or focus groups. In most cases, a small number of participants participate in this type of research, because to carry out such a research endeavor requires many resources and much time. Interviews can vary from being highly structured and guided by open-ended questions, or be less structured and take the form of a conversational interview.</p> <p>ADVANTAGES:</p> <ol style="list-style-type: none"> 1. Allows identification of new and untouched phenomena. 2. Can provide a deeper understanding of mechanisms. 3. Provides verbal information that may sometimes be converted to numerical form. 4. May reveal information that would not be identified through pre-determined survey questions. <p>DISADVANTAGES:</p> <ol style="list-style-type: none"> 1. Cannot generalize to the general population 2. Challenges in applying statistical methods

Table 14 - Shows the distinction between quantitative and qualitative.

The present research focuses on open innovation strategy for large companies and small and medium companies in Portugal. The scope of this study is to identify the challenges and the opportunities that Portugal has been encountered so far, in order to suggest the implementation of a strategy to improve open innovation. The method used on this research is a qualitative method. The analysed data was gathered through presential interview with open questions. Having as goal get a wide view of the textile sector in Portugal, we have worked with people/institution from different places (regions) and with different perspectives (see table 15) and (see figure 4), namely:

INSTITUTION	NUMBER OF PEOPLE
UNIVERSITY	2
RESEARCH CENTRE	1
TEXTILE ASSOCIATION	1
TEXTILE DEVELOPMENT ASSOCIATION	1
TEXTILE WOOL DEVELOPMENT ASSOCIATION	1
SME (SMALL AND MEDIUM ENTERPRISES)	1

Table 15 - List of institution and people interviewed

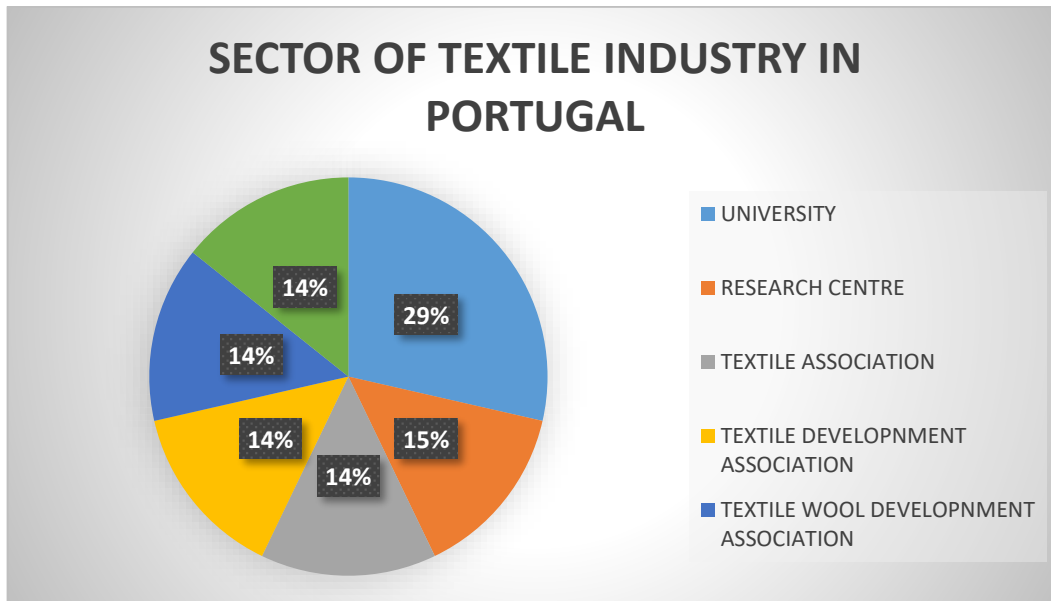


Figure 4 - Sector of textile industry in Portugal.

The pie chart shows that the qualitative approach used in the study tried to cover all the most relevant areas of “thinking” textile sector in Portugal.

3.2 Case Study: (Textile Sector in Portugal)

3.2.1 History of Textile and Clothing Sector in Portugal

Globalization has brought out worldwide Textile and Clothing fabricating bases to the creating nations. Yet, every nation or area has their own conventional bases in a specific arrangement, many created nations especially in Europe was attempting to keep in place their customary bases alongside some current mould and configuration based increments. Portugal was not quite the same as them, likewise as they were nearly aggressive as far as cost of utilities and labour in contrasted with neighbouring nations, regardless they hold some standard retail brands' assembling bolster exercises. Because of provincial impacts in Brazil, Portugal's cotton industry took frame amid the eighteenth century with generation focused in Lisbon. By bringing in the essential hardware from Britain, the Portuguese could equip many production lines and get their economy under

way. When the nineteenth century moved around, Portugal had started to investigate another specialty inside the material business: cloth generation. With flax strands imported from Hamburg, the nation was very much situated to practice inside the business – particularly in northern locales, similar to the city of Guimaraes where an accumulation of little streams gave the fundamental water supply. Some cloth makers spun strands, while others wove them together to shape the noteworthy textures. Material was especially well known for use in articles of clothing; the colouring procedure was free of unforgiving, chafing chemicals and yielded a supple material that turned out to be progressively delicate with laundering. Unlike the cotton business, the cloth exchange was not manufacturing plant based. It started as a local leisure activity, and individuals would weave their own materials on little, family unit looms. Today, the Portuguese material industry represents around 9% of the nation's yield. 90% of the materials created are proposed for fare, with 40% bound for the United States. Lamentably, in the same way as other nations, Portugal is as yet weathering the impacts of the 2008 worldwide subsidence. The material business mirrors this, as unemployment increments and creation diminishes. In the course of the most recent decade its yield has dropped by almost 30%. The minimal effort rivalry of China – at a lessening of 60-70% – makes this daunting struggle considerably more troublesome (Textile Today, 2017).

3.2.2 The Rise of Textile and Clothing Sector in Portugal

Toward the finish of the 90's, many brands moved their generation to Asia to build their edges. Hong Kong, China and India turned into the focal point of material creation for everybody, including creators and extravagance brands. Today, Portugal sees huge numbers of them returning. Also turned into a key player in the sourcing methodologies of the vast majority of the primary European brands. Notwithstanding the blasting of the Far East enterprises and the subsequent move of the significant clients over the most recent two decades, brands are currently considering pertinent factors, for example, the vicinity and the material business legacy among others. As a maker and as Portuguese natives, they want to see brands coming to deliver here considering the nature of items and administrations instead of on the grounds that they speak to shabby European work. Costs must be focused, yet there is substantially more past in Portugal. They are simple individuals to work with, clear and essentially, dependable and fair. They might want to see brands acknowledging and regarding their history of craftsman's and amazingly all around qualified specialists in the textile business. At present Textile Industry represents about 10% of national exports in Portugal, as well as 2% of the national GDP and 4% of the employees. It is then a significant sector in the Country. As some European countries, the Portuguese textile industry has a high added value and "Made in Portugal" refers to high-quality products. Portugal is however not the only country in the EU with a strong textile and clothing (T&C) industry. It indeed only represents 4% of the EU T&C

Industry, which means other EU countries are powerful. Italy, Germany and France for instance account for 35%, 14% and 10% of the EU turnover (Portuguese Textile, 2017).

3.2.3 Textile Sector Performance in Portugal

The textile and clothing sector in Portugal is one of the key industrial sectors in Portugal and is one of the most important industries in the Portuguese economy. It represents

- 9% of the Portuguese Total Exports.
- 20% of the Assembling Industry's Employment.
- 8% of the Manufacturing Industry's Turnover.
- 8% of the Manufacturing Industry's Production.

The sector accounts for providing employment to a large of labor force in the country. It creates employment for 180,000 employees and it contributes for about 12% of the Portugal's export revenues. Portugal has around 13,300 companies working in all sub sectors of textile and clothing industry some of them are vertical units, but the majority are small and medium-sized enterprises all well-known for their flexibility and quick response expertise and innovation. The textile and clothing companies are mainly placed in the north of Portugal (Porto, Braga, Guimarães, Famalicão), but there are also some companies located in Covilhã (East of Portugal) working with wool products (from yarns to clothes). During the financial year 2008, owing to the global financial crisis the production of the textiles products in the country declined and the exports fell by 6.5 percent during the period. However, after the financial turmoil subsided, the Portugal government took initiatives to boost the textile industry. The federal government of Portugal not only provided financial aid to the local investors but also attracted foreign investments in the sector. The government announced a massive financial package of 850 million Euros to stimulate the domestic textile and clothing industry and encourage exports of textile products. The government has also provided financial incentives to foreign companies for modernization of the textile units in the country. Besides, the government also provides essential help to make credit available to foreign players investing in the textile sector. The Textile and Clothing Industry is one of the most important industries in the Portuguese economy. The table 16 explains the textile sector performance from 2006 to 2012 (ATP, 2017).

MILLION (€)	YEAR						
	2006	2007	2008	2009	2010	2011	2012
PRODUCTION	6,608	6,660	6,132	5,123	5,631	5,102	4,905
TURNOVER	6,827	6,895	6,358	5,349	5,829	6,075	5,774
EXPORTS	4,218	4,352	4,088	3,501	3,844	4,152	4,128
IMPORTS	3,289	3,417	3,295	3,038	3,424	3,388	3,046
EMPLOYMENT	180,379	176,226	168,117	148,059	138,124	133,100	127,976

Table 16 - Textile Sector Performance (ATP, 2017).

The table 17 explains the import and export in 2012.

	PRODUCT
EXPORT	<ul style="list-style-type: none"> • Clothing and accessories, knitted or crocheted (39% of T&C total exports) • Clothing and accessories, not knitted or crocheted (21%) • Other made-up textile articles, including home textiles (12%)
IMPORT	<ul style="list-style-type: none"> • Clothing and accessories, knitted or crocheted (26% of T&C total imports) • Clothing and accessories, not knitted or crocheted (26%) • Cotton raw materials, including yarns and fabrics (11%)

Table 17 - Products Export and Import in 2012 (ATP, 2017).

3.2.4 SWOT Analysis of Textile Sector

The table 18 explains the SWOT analysis of Textile Sector in Portugal. (ATP, 2017).

	CONTENT
STRENGTH	<ul style="list-style-type: none"> • Tradition and “know-how” • Modern equipment and technologies • Flexibility and high reactivity • Complete, structured and dynamic T&C chain • T&C chain supported by consistent and developed competence centers (CITEVE, CENTI and MODATEX) • Geographic and cultural proximity to clients
WEAKNESSES	<ul style="list-style-type: none"> • Low productivity • Low educational level across the companies’ human resources • Reduced dimension of companies • Companies’ decapitalization • Low service rate • Companies’ individualism
OPPORTUNITY	<ul style="list-style-type: none"> • Market niches • Emerging markets • Industrial specialization • Technical and functional textiles • Companies’ concentration and cooperation to gain critical dimension and competitiveness • Proximity to clients and small series of high added value • Fashion, brands and distribution “made in Portugal”
THREATS	<ul style="list-style-type: none"> • Hard International competition on basic articles, but also on higher added value ranges • Credit access difficulties and the cost of money • Persistence of economic crisis in the Portuguese T&C traditional client markets

	<ul style="list-style-type: none"> • Lack of attractiveness for young professionals, who opt for other activities • End of superior courses and decline of specialized professional education • Risk of disruption of T&C chain
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Table 18 - SWOT Analysis of Textile Sector (ATP, 2017).

3.2.5 Business Model for the Portuguese T&C Industry

To improve the industry performance and increase market value there are three business models, according to (ATP, 2017) explained in table 19.

MODEL	PERCENTAGE
Services: Specialized Sub-contract and Co-Contract	55
Brand and Distribution Management, including retail	25
Development based on technologic innovation. Technical and Functional Textiles	20

Table 19 - Business Model.

3.2.6 Challenges and Thoughts about Sorts of Innovation Inherit in SME (Small and Medium Enterprises)

Today, numerous small organizations are gone up against with unforgiving economic situations. The current monetary emergency has debilitated the budgetary soundness of numerous little and medium-sized firms (SMEs), particularly in ventures in which remote, minimal effort makers have entered the market and are undermining the survival of the current contenders. Likewise, new government directions can change a productive SME specialty business into a bad dream in only half a month or months. Innovative new companies have bleeding edge innovation in-house, however no assembling capacities or dispersion channels to transform the innovation into an effective and gainful business. Changing economic situations in this manner constrain smaller firms to adjust or rehash their business through new advances or extraordinary offers. In the meantime, small firms confront a few imperatives in separating their items and changing their plan of action. A noteworthy obligation is that small firms do not have the required inner budgetary assets and specialized capacities. They along these lines must team up with outer accomplices to advance effectively, to grow new wellsprings of pay, and to achieve more gainful positions in the aggressive scene. Open Innovation is along these lines a coherent advance for some SMEs to take.

- Difficulties Facing SME in the Current Scenario:

As the relentless pace of globalization juggernauts into the 21st century, SMEs need to perceive the estimation of IP as data, an instrument and a benefit. At that point, SMEs need to figure out how to enhance IP administration to support and cultivate development. IPR empower SMEs to have selectiveness over the abuse of their

developments. Selectiveness gives control and makes a motivating force for venture, coordinated efforts, authorizing and in this way, gives a strong business stage to propelling an intelligible worldwide procedure. As a rule, SMEs confront noteworthy dangers since they regularly have less assets and constrained aptitude in IP issues when contrasted with the bigger multinational partnerships. Still and all, as these same partnerships have shown during recent decades, the powerful administration of IP is essential for distinguishing helpful learning and for catching the estimation of an association's IPR. SMEs can make strides towards comparative IP administration limit and capacity. Extensively, SMEs must perceive the basic significance of IPR in their business technique.

- **Need of SMEs to Embrace Open Innovation in the Current Scenario:**

Globalization is quickly making new market openings that require new advancement systems. The inexorably serious quickening of globalization is being driven by mechanical advance and worldwide exchange, including exceedingly incorporated worldwide esteem chains. These, thusly, additionally catalyse the excited internationalization of innovative work, development and commercialization. Globalization, thus, must be overlooked, neglected or disdained at extraordinary hazard. Perceiving that the relentless pattern of globalization in the 21st century will proceed unabated, it is essential to perceive that open advancement can quicken the internationalization of development for SMEs. SMEs need to associate with, create and coordinate worldwide development systems. Sourcing of information and limit over the globe will solidify innovative work, centre development, bring down exchange expenses and propel item commercialization. One especially appealing model for mix of SMEs into the learning economy of creating nations is a centre point and spokes game plan, wherein the centre point is a national research establishment or college and the spokes are SMEs which fill in as advancement channels moving essential innovative work towards common sense business improvement and, in a perfect world, worldwide business appropriation.

For SMEs, open development will require more open IP administration, e.g., permitting in from outside gatherings to get to integral innovation and furthermore making an incentive by authorizing unused advances or by auctioning off auxiliary licenses, i.e., task. This system of exchanges brings about a win-win trade, an open worldwide commercial centre for advancement. Innovation, and coming about development, advertise exchanges can turn out to be more productive, with purchasers and venders organizing in an open worldwide commercial centre. IP, or to be more particular IPR, is progressively observed as a money for encouraging and quickening universal innovative exchanges. For SMEs, grasping open advancement will include moves in administrative culture; executing an ace dynamic technique towards administration and expansion of significant worth for IPR is basic. Still and all, this won't happen immediately; building a

culture of open advancement requires compensated cooperation and hierarchical changes that cultivate inward and outside joint effort. This requires chance taking. All things considered, SMEs must perceive that hazard is sensible, that potential prizes can be colossal and that in the 21st century a worldwide point of view may wind up plainly basic.

3.2.7 Collaborative Strategy Advancement in Portugal

The main way to deal with bunch strategy as far as political talk in Portugal, has beginnings in the examination requested by the Portuguese Government to Michael Porter's Monitor Organization, in 1992. This investigation set forward an arrangement of proposals on groups that Portugal ought to create with a specific end goal to make its economy more focused. The "Doorman Report" was displayed in 1994, recommending that the Portuguese economy ought to work in territories where it as of now had relative favourable circumstances, giving for instance the material, wine, plug, footwear, woods items or moulds. It was a sectorial and static view, since the investigation introduced made no reference to the advancement of these territories after some time, nor had considered other rising zones where Portugal could later be focused (eg., sustainable power source or in data and correspondence innovations). To Michael Porter, Portugal should wager just on alleged "conventional divisions", overlooking the likelihood that Portugal have the capacity to create aptitudes in higher esteem included regions or innovative force divisions After the Porter Report, in the period 1995-2001 there were no references to the bunch arrangement at political talk level. Only in 2001, the bunch approach was incorporated again in Governmental arrangement reports, situated in an investigation expounded by the Portuguese Government, with the mapping of existing and developing bunches in Portugal, yet in a last request viewpoint and not on a sectorial/modern point of view. This cluster assessment process indicated shortcomings in participation between the substances having a place with bunches, with the presence of couple of collective activities between organizations (both inside and between various groups), the absence of associations or ventures with worldwide associations, the minor investment in innovation stages or, on the other hand in worldwide R&D ventures, and additionally the modest number of formal coordinated efforts between substances having a place with the group or between bunches themselves (SPI and innoTSD, 2013). Being the synergistic procedures fundamental for the improvement of open development exercises, these certainties can mean the presence of less positive conditions for open innovation improvement.

3.3 Data Collection

The strategy to assemble the information was to do some presently meetings with people from different areas, but with important roles on the Institution. Table 20 explains the personal information of the interviewed and the questioned companies.

NAME	POSITION	COMPANY	ABOUT THE COMPANY
MR.PAULO CADEIA	INNOVATION MANAGEMENT DIRECTOR	CITEVE (TECHNOLOGY CENTRE)	CITEVE is a National and European reference institution for the promotion of Innovation and Technological Development of the Textile and Clothing Industries, CITEVE - Technological Centre of the Textile and Clothing Industries of Portugal is a private, non-profit public entity.
MRS.SONIA ROCHA	SALES PERSON	MEFRI (SME)	Established in 1981, MEFRI is a family based company located in the north of Portugal. It started by producing exclusively adult shirts, progressing later to the manufacture of children’s wear. Mefri takes pride in setting high quality standards and work ethics.
MR.ANTONIA MANUEL MR.LUIS ALMEIDA	PROFESSOR	UNIVERSITY OF MINHO	The University of Minho, founded in 1973, is one of the named "New Universities" in Portugal. An University which deeply changed the landscape of higher education in Portugal.
MR.PAULO PEIXOTO	DIRECTOR	ADRAVE	The ADRAVE - Regional Development Agency of Vale do Ave, SA was created on September 15, 1998, as a platform for cooperation between the public and private sectors for the development of a regional space.
MR.JOSE CARLOS	PRESIDENT	ANIL	ANIL is the Portuguese Wool Textile in Portugal. It has in its possession a sort of official documents, a triptych, paints and books that evidenced the importance of the Portuguese Textile Industry to Portugal and its people during the Portuguese classic history.
MR.ANA PAULA	INTERNATIONAL RELATION	ATP	“ATP – Association of textile in Portugal” (Textile and Clothing Association of Portugal) is an employer’ association that contain 500 companies from the entire Portuguese textile and clothing sector.

Table 20 - Analysis of interviewer.

The inquiries for the most interviewed, were related with the procedure of an open innovation technique and the way how it could influence specific angles which could trigger difficulties and openings. To give an essential understanding with respect to the hypothesis and idea of open innovation methodology, we talked about the hypothesis

and idea of this system before the meeting began. We felt this step vital because it has been a way of understanding the concepts and have a common language.

3.4 Data Analysis

We used a questionnaire covering various aspects of Portugal textile and open innovation questions; for evaluation, we classified the questions in a scale containing a range between 1 and 5, where 5 meant “Excellent”; 4 meant “Good”; 3 meant “Average”; 2 meant “Poor” and 1 meant “Very Poor”.

3.5 Interviewed Perspective about Questionnaire

The questionnaire had 6 main areas to explore and we tried to understand the perspective from each of the interviewed. Table 21 shows the results and more data can be found on the annexes from 6.2 to 6.7.

QUESTIONS	RESEARCH CENTRE	A T P	ADRAVE	UNIVERSITY	S M E	ANIL
GENERAL						
Textile & clothing sector is important in Portugal	5	5	5	5	5	5
Contribution of textile and clothing sector in Portugal market	5	5	5	5	5	5
Do you like this sector	4	4	4	4	4	4
Textile sector has more important than another sector	5	5	5	5	5	5
Future of textile and clothing sector your Prediction	5	5	5	5	4	5
Innovation is more important in current scenario	5	5	5	5	5	5
INNOVATION						
Innovation is important in textile and clothing sector	5	5	5	5	5	5
In your institution, you have enough place for innovative ideas	5	5	5	4	3	5
Innovation has influence your organization culture	4	4	4	3	3	4
Innovation strategy you have recently encountered	4	4	4	4	3	4

Institute promote innovative ideas from outside	3	4	4	4	2	4
To run successful organization in 21 st century you think to promote innovative ideas from others	5	5	5	5	5	5
PATH TO OPEN INNOVATION						
Open innovation influences your organization	4	4	4	4	3	4
Last five years how open innovation influence your institute	3	4	4	2	3	4
Open innovation activity has more influence your business function	4	4	4	4	4	4
Satisfied with new innovation philosophy	5	5	5	5	5	5
Opposite between the old and new innovation thinking	5	5	5	5	5	5
HOW TO BE OPEN						
Open means gaining innovative ideas form outside or inside the company this lead to open innovation	4	4	4	4	4	4
You regard your company open	5	4	4	5	4	4
Working with open innovation	5	4	4	4	4	4
Cultural difference has an impact on open innovation	5	4	4	4	4	4
Importance of open innovation leader in a company	5	5	5	5	5	5
Future of innovation is open and global do you agree	4	5	5	4	5	5
SHARING AND PROTECTING						
Do you regard your company protective	5	3	3	4	3	3
Your company protect its innovative ideas	3	3	3	4	3	3
You satisfied with this protection	5	3	3	5	3	3
Company tries to open up to the outside world, how to protect your innovative ideas at the same time	4	4	4	4	3	4
Your company ensure the place for both sharing and protecting	4	4	4	4	3	4
It is possible to have both protective and collaborative innovation philosophy at the same time	5	5	5	5	4	5
Do you think is more important now, being open to everyone or protecting ideas from competitors	4	5	5	4	4	5
SME (SMALL AND MEDIUM ENTERPRISES)						

Small companies should embrace open innovation	4	2	4	3	4	4
Benefits of innovating together with other small companies	4	2	4	3	4	4
Small and medium industry are suitable for open innovation	5	2	5	4	4	4
In my point of view open innovation is much needed in small and medium industry what is your view	5	2	5	4	4	4
Open innovation is very much about ecosystems with several partners. Small companies often take the back seat in such setups. Is this a problem	5	2	5	4	4	4

Table 21 - Interviewed perspective about questionnaire.

The above table explains the different views of the interviewed perspective about the questionnaire. Through its analyse, we may conclude that the interviewed seem to have similar approach about the inquired themes. However, when the subject is related to SME, the players disagree, and the score for the same question is very different.

Case 1:



- Problem: SME faces difficulties to do Innovation in their Industry.

Case 2:



- Problem: ATP (Association of Textile in Portugal) has a view that SME is not suitable for Open Innovation.

Figure 5 explains how these two interviewed players think in a different way when compared to the other interviewed.

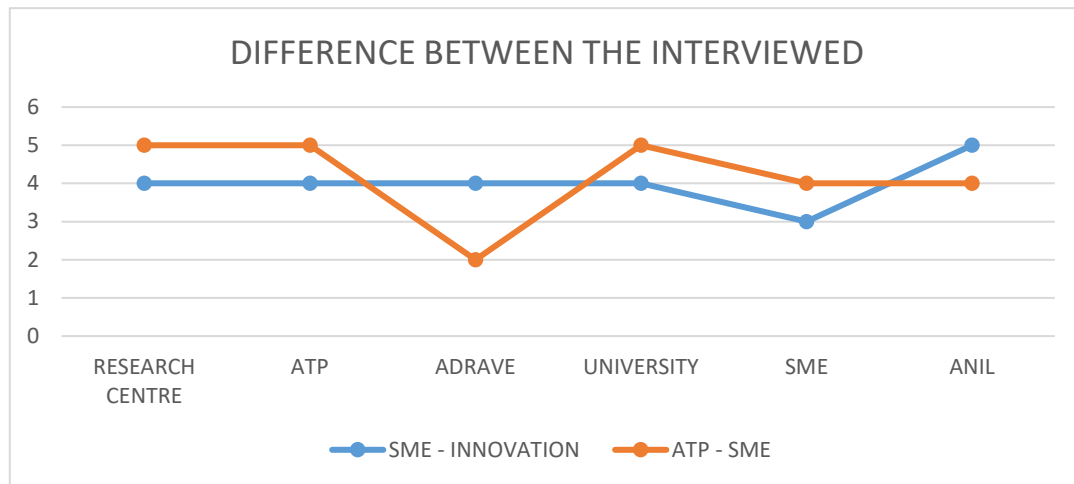


Figure 5 – Different perspectives for SME and ATP

In fact, everything seems to be related with different perspectives, especially due the fact that SME’s and ATP daily face the real problems and market restrictions. In our perspective, some solutions could be through:

Case 1: SME faces difficult to do Innovation in their Industry.

- The biggest problem faced by SME’s is the financial crises. They don't have enough finances and resources to practice and develop innovation. The result is that the added value of their offer is more and more low when compared to the other players and competitors worldwide. To surpass this fail, SME’s need to change their mindset and need to adapt themselves to open innovation strategy. Government must organize strategic and differentiated programs to implement on SME, not as a subsidy but as a financing that helps leverage the business. Chapter 3.7 will explain more in detailed how to help improve SME.

Case 2: ATP (Association of Textile in Portugal) has a view that SME is not suitable for Open Innovation

- ATP is the most important textile association in Portugal. It plays a major role in the development of textile sector, but its view about SME in Open Innovation is not good. SME are far behind from large companies in every aspect and needs more care. ATP has more contacts with large companies, companies that have wide knowledge about textile sector in Portugal as well as in the world market. ATP has a good knowledge about its associate and must organize initiatives and actions in order to improve SME’s. ATP should act as a link between big and small enterprises. Should be the leader and the link. The greatest part of the textile industry in Portugal are SME and SME must be helped in this process. Otherwise they will disappear in a short and medium term.

3.6 Views and thoughts about the questionnaire

Here we explore our view and thoughts about the questionnaire. After interviewing the people our perception is explained in table 22.

CONTENT	VIEWS ABOUT THE QUESTIONNARIE
GENERAL (PORTUGAL TEXTILE)	<ul style="list-style-type: none"> Textile and clothing sector is very important in Portugal. The textile sector is a traditional sector and its contribution is very high compared to another sector. It plays a major role in the Portugal market; the textile and clothing sector have a bright future.
INNOVATION	<ul style="list-style-type: none"> Innovation is the major element in textile and clothing sector; without innovation, the survival of the textile and clothing sector is a question mark. In the Institutional point of view there should be enough place for innovation ideas. The impact of innovation changes the organizational culture. In recent years the impact of innovation strategy is good and ideas from outside has been introduced and developed in the institution.
PATH TO OPEN INNOVATION	<ul style="list-style-type: none"> In recent years open innovation influence more the organizational culture, It has been a steady growth of open innovation in organization. New innovation philosophy creates a huge impact. The satisfaction level is better compared to previous levels. Open innovation technique should be developed in every organization.
HOW TO BE OPEN	<ul style="list-style-type: none"> Open means gaining ideas from outside: this leads to open innovation. This technique should be followed by organization for being able to compete in current world market. The impact of an organization to be open has been the major role. The open innovation work and practice leads to company growth. Open innovation creates a major impact in cultural difference and importance of innovation. The leader's figure is very important in all organization and should have wide knowledge of open innovation.
SHARING AND PROTECTING	<ul style="list-style-type: none"> Organization should have a good knowledge about sharing and protecting. In current scenario, this is one of the major problem. Management department should take necessary steps to overcome this situation. There should be a clear mind set of how the organization should be open to the outside world as well as how to protect innovative ideas at the same time. It is possible to have both protective and collaborate innovation philosophy. Being open to everyone is important in current scenario.
SME (SMALL AND MEDIUM ENTERPRISES)	<ul style="list-style-type: none"> Small companies should embrace open innovation. At the present scenario, they should be open to compete with current world market. Small companies should collaborate with other companies to improve their standard and this would be a good sign for the country's economy. Small and medium enterprises are suitable for open innovation, but the mindset should be changed to adapt the current philosophy.

Table 22 - Views and thoughts about the questionnaire.

3.7 Introduce Collaborative Efficient Strategy to Implement on SME's

For the development of the textile industry in Portugal it will be necessary for SME's to promote effective strategy in order to improve its performance and create more opportunities. There are different collaborative strategies that can be used. In our opinion, the following strategies would be the suitable, namely:

Strategy 1: University in the centre of the changing process

Figure 6 explains the collaborative strategy 1 to implement on SME's.

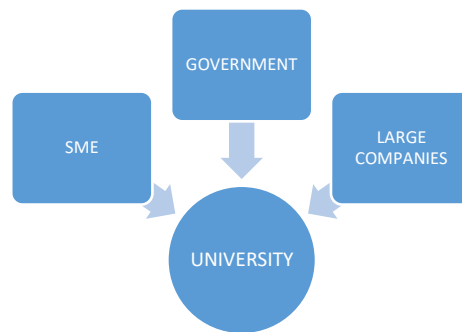


Figure 6 - Effective strategy 1.

To promote open innovation thinking the best solution is to start from University. Students can be more educated about the benefits of getting more knowledge about it. Open innovation is a group's strategy where every individual has responsibility and the, Government should play major attention and have a major role on it. Government should promote conditions to get universities closer to companies. If students learn and know what market needs, they will be more able to answer to problems in an efficient way.

Strategy 2: Research Centre as a link between companies

The figure 7 explains about the collaborative strategy 2 to implement on SME.



Figure 7 - Effective strategy 2.

Another way of promoting open innovation thinking can come from the Research Centres, as they have wide knowledge about open innovation. This scenario will help companies to better know and understand what open innovation is and why it is so important for their competitiveness. Eventual approaches between Research Centres will led companies to get more contacts and work on their own research and development.

Strategy 3: Government in the centre of the changing process

The figure 8 explains about the collaborative strategy 3 to implement on SME.

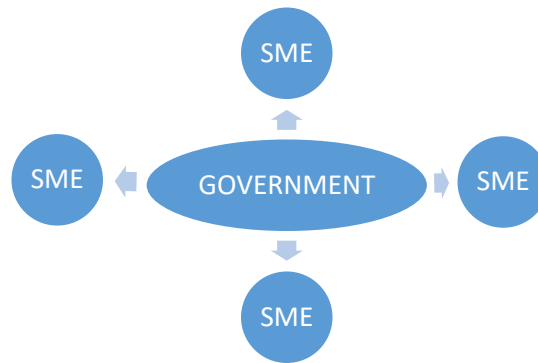


Figure 8 - Effective strategy 3.

Government must organize strategic and differentiated programs to implement on SME's. These programs should be introduced in every region of the country. Government should provide funds to improve company's business and competitiveness. These will certainly increase the opportunity and participation for all small and medium enterprises, as well as big enterprises.

Strategy 4: Open Innovation in the centre of the changing process

The figure 9 explains about the collaborative strategy 4 to implement on SME.

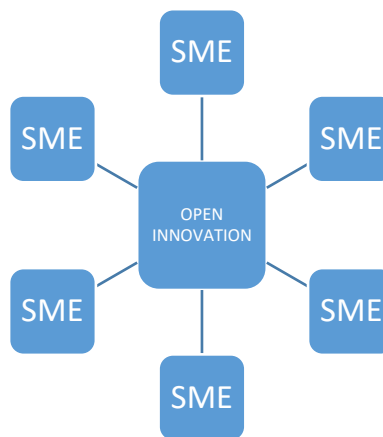


Figure 9 - Effective strategy 4.

The best solution to promote open innovation thinking seems to be work on group or clusters, in an innovative project. SME's start to collaborate and cooperate with each other: a good sign of development. This collaborative strategy represents the cooperation between all the players of the clusters. This strategy leads to reduce financial restrictions and will certainly conduct to increase the market value. Also, will help to grow networking and competitiveness.

These four strategies seem to be the most adequate. However, strategy 1 and strategy 3 are more important: if University and Government take steps to implement forces in all valuable SME's everyone "will join hands with them". Figure 10 explains the process.

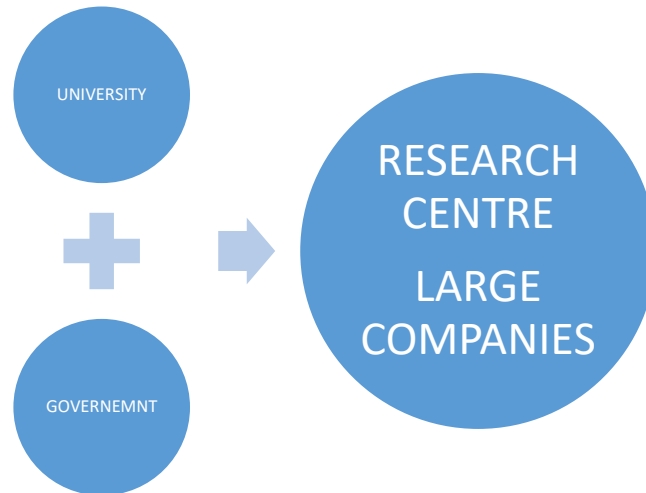


Figure 10 - Chain Process

Research centre and Large companies will maintain a good relationship between University and Government, whereas, for its part will lead to get improvement on SME, as they will be closer and will be more open minded.

3.8 Collaborative Strategy between Portugal and India

Portugal major competition in textile is Asian countries like China, India and Bangladesh. In textile and clothing sector India and China have good market value. They are the leading exporters and importers in the sector. The major threat for Portugal in textile is China's market. To overcome this, Portugal should be more collaborative with India, because India is a big competitor to China. Portugal and India have good relationship between them and if this happens there will be mutual winning for the countries: Portugal is strong and innovative; India has a good market value all over the world. Figure 11 explains the mutual exchange between the two countries.

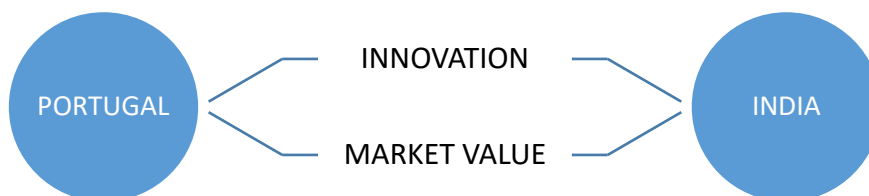


Figure 11 - Mutual exchange between Portugal and India

The Indian market is one of the biggest and quickest developing economies in the world. Development of the industrial sector expanding utilizations of specialized textile in the development business are the key elements energizing the interest in textile sector.

3.8.1 Relationship between Portugal and India

India emerging as rapidly growing major economy. Portugal increasingly looking at key developing countries like India for enhancing trade and investment since the economic crisis of 2008. Both countries are looking to deepen economic engagement. Bilateral trade has been growing steadily over the last few years but remains modest at US\$ 812.34 million in 2016-17. Portuguese investments into India amount to US\$ 42.62 million and Portugal ranks 55th in terms of the overall FDI inflow into India. With Portugal and India sharing similar priorities in terms of boosting domestic economic growth, investment, employment, industry and innovation, there are several sectors with complementarities where partnerships can be forged to mutual benefit, such as: infrastructure (roads, ports, inland waterways), renewable energy (wind and solar), ICT (Start Ups), Water & Waste Management, Agro-Processing, Tourism and Hospitality (Embassy of India, 2017). The table 23 explains the trade and investment of Portugal and India.

CRITERIA	CONTENT
BILATERAL TRADE	<ul style="list-style-type: none"> Bilateral Trade has been growing steadily during the past few years. In 2016-17, bilateral trade was US\$ 812.34 million. Indian exports stood at USD 671.17 million and Portuguese exports at US\$ 141.16 million. Trade balance has always been in favour of India. Bilateral trade increased by 120 Million over the previous year's figure of 692.19 Million, registering an increase of 17.3%. Major articles of export from India include: Cotton; Fish & Crustaceans; Iron and Steel; Machinery and Mechanical Appliances; Footwear; Plastics and articles; Man-made fibres; Organic Chemicals etc. Major articles of import from Portugal are Machinery and Mechanical Appliances; Electrical machinery and equipment; plastics; organic chemicals; copper and articles; paper; raw hides and skins etc.
PORTUGUESE INVESTMENT IN INDIA	<ul style="list-style-type: none"> Portugal ranks 55th in Foreign Direct Investments to India, with total FDI inflows amounting to USD 42.62 million. Major Portuguese investors in India are: Martifer (Porto) in the Metals Manufacturing sector; Efacec (Oeiras) in Industrial Machinery, Equipment & Tools sector; Euroamer Garuda, a subsidiary of Euroamer (Lisbon), a Construction project in Bangalore in the Real Estate sector; Sodecia's acquisition of the Indian Automotive Ancillary Services Group in 2011; Petrotec Group in production, marketing and providing technical support for equipment and systems for the oil industry's distribution and retail areas.
INDIAN INVESTMENT IN PORTUGUESE	<ul style="list-style-type: none"> Indian investments in Portugal are in the range of USD 150 million. Portugal has initiated a Golden Visa scheme to attract non-European investors to Portugal. The first major foreign investor under the Golden Visa Scheme who was given a residency permit was an Indian Hotelier, N. Muthu who invested Euro 50 Mn in three hotels in the Algarve region and was awarded the Golden Visa and Resident permit by Portuguese Foreign Minister Dr Paulo Portas during his visit to India in March, 2013. Other investors from India include: Saptashva Solar, a subsidiary of XL Telecom & Energy in the Renewable energy sector in a Electricity project; TCS Iberoamerica in a IT and software services project in the city of Lisbon; Shakthi Auto component a subsidiary of Sakthi Sugars, Chennai with approx US\$ 30 mn investment in an auto component plant in Agueda. Another Indian company Zomato has invested Euro 11 million in Portugal.

Table 23 - Trade and Investment of Portugal and India (Embassy of India, 2017).

3.8.2 India Textile and Clothing sector

As the world's largest producer of textile and attire, India's textile and clothing part is a noteworthy supporter of India's economy. The textile and clothing segment is the foundation of the Indian economy, India's domestic textile and apparel industry is highly diverse, consisting of hand-spun and hand-woven operations at one end of the manufacturing spectrum to sophisticated and modern mills at the other end. The domestic textile and apparel industry is vertically-integrated across the value chain and extends from fiber to manufacturing but largely operates in the form of manufacturing clusters, with roughly 70 textile clusters producing 80 percent of the country's total textile production. Even though India's textile industry is a huge contributor in terms of exports, industrial output and employment, like China's, India's domestic industry is not without its challenges. The quality of the Indian material industry originates from its fare profit. The upper hand that India had regarding its low work costs has been disintegrating gradually because of rivalry from nations like Bangladesh and Vietnam that offer a talented workforce and less expensive work (Textile India, 2017).

3.8.3 Factors that foreign countries find to collaborate in with India

The growth of market in India is the improvement in standard of people. Their financial status has been improved and increasing in number of people and this is a key factor. The table 24 explains the factors that foreign countries find to collaborate with India.

CRITERIA	CONTENT
POPULATION	<ul style="list-style-type: none"> India has a large population base containing more than one and quarter billion people. Half of the Indian population is under 25 years and this population joins the workforce and they are earning people, so the spending force will increase. Textile and clothing will be the prime recipient of this expansion in obtaining power.
INCREASE IN BUYERS	<ul style="list-style-type: none"> In recent two decades, the buyer purchasing propensities have changed essentially in India. They have moved from a need based buy to aspiration-based buy. Nowadays consumers are inclining more towards branded product, especially in fashion segment People in urban areas are spending substantially more on attire than they did 10 years back which has brought about an expanded concentration by brands and retailers in these urban areas.
INCREASE URBANIZATION	<ul style="list-style-type: none"> In this century, an increment in the urban population, development of urban areas and a developing impact of urban patterns and services in rural areas is being witnessed in India. The joined impact of these progressions is putting more cash in the hands of individuals and is making new desires and request which will thus will have a noteworthy development effect on attire utilization.
GROWTH OF ONLINE RETAIL SALES	<ul style="list-style-type: none"> India is encountering a digital revolution throughout the most recent couple of years and many individuals are presently associated with the internet. This has brought about an upsurge in internet retailing as to ever-increasing extent individuals are searching for simplicity of shopping, substantial discount offered by online entryways, and better payment and return policies.

Table 24 - Factors that may convince Portugal to collaborate with India (FICCI, 2017)

3.8.4 China downfall in Textile and Clothing sector

China has been the undisputed leader in global trade over the last three decades. In the textiles and apparel segment especially, China has maintained a dominant share of over 40% over the last twenty years. Exports have played a pivotal role in this economic success of China. Between 2001 and 2014, Chinese apparel exports increased more than 5-folds from US\$ 54 bn. to US\$ 193 bn., growing at 10% CAGR. China has achieved this status in the world trade by leveraging its large human resource base, low manufacturing costs and large-scale infrastructure which has resulted in large scale investment across the sectors. However, in the recent years, China’s growth in the global textile and apparel trade has slowed down. After the economic crisis of 2009, China’s growth in the trade has slowed down from an average 15% to around 4% in 2014 (FICCI, 2017).

India biggest problem in textile sector is low focus in Innovation where this makes India competitive level decreases compared to other countries. Portugal is strong in innovation if Portugal and India collaborative with each other there will be development, the figure 12 explains the development process.

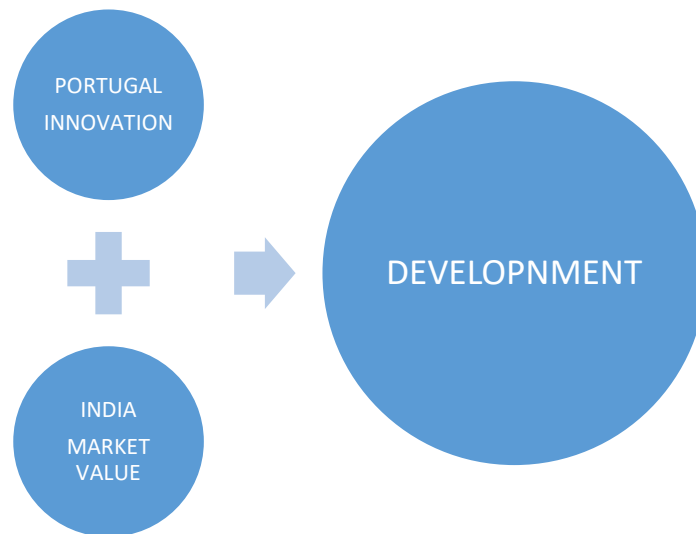


Figure 12 - Development Process using collaborative strategy

CONCLUSIONS

4.1 Conclusions

4.2 Proposal of Future Works

4 CONCLUSIONS AND PROPOSALS OF FUTURE WORKS

4.1 Conclusions

Open Innovation is essential in the present life. It helps the improvement of the business conditions: when organization must be more competitive and differentiated the changes must happen first “inside house”. Open Innovation infers another worldview for the administration of the 21st century. It is a fact that organization need be open, need collaborate and, sometimes even develop new products or concepts near clients, suppliers or competitors. Both the literature review and the case study of the textile sector in Portugal seems to demonstrate that looking at the market, alone and with an internal perspective is something from the past. Nowadays the world is changing too quickly and organization should be agile and flexible. Should also work more closer and in a collaborative and cooperative way. The future is more sustainable for those companies that already understood that open innovation is the key to get competitive advantages and face the market’s adversities.

The study conducted seems to point out the main benefits of Open Innovation, namely in:

- 1) Innovation: In the Institutional point of view there should be enough place for innovation ideas. The impact of innovation changes the organizational culture. In recent years the impact of innovation strategy is good and ideas from outside has been introduced and developed in the institution.
- 2) Open Innovation: Open Innovation philosophy creates a huge impact; the satisfaction level is better when compared to previous levels. Open innovation technique should be developed in every organization.
- 3) How to be Open: Open innovation creates a major impact in cultural difference and importance of innovation. The leader’s figure is very important in all organization and should have wide knowledge of open innovation.
- 4) Sharing and Protecting: It is possible to have both protective and collaborate innovation philosophy. Being open to everyone is important in current scenario
- 5) SME: Small and medium enterprises are suitable for open innovation, but the mindset should be changed to adapt the current philosophy.

The initiatives to promote open innovation should be taken by the University, the Government, the Research Centres, the Textile Associations and the Large Companies:

- 1) University: University is the centre of the changing process. Students can be more educated about open innovation. Government should promote condition to get

university closer to companies, as this approach is a key factor in the process that may help to get better answer to market needs.

- 2) Government: Government must organize strategic and differentiated programs to implement on SME's. These programs should be introduced in every country's region and should provide funds to companies to improve business and performance.
- 3) Research Centre: Research Centres have wide knowledge about open innovation. If closer with companies, companies will certainly understand what open innovation is and why it is so important for their competitiveness and sustainability.
- 4) Textile Association: Textile Association should take initiatives to implement in order to improve SME. It also should be the intermediate between large companies and SME. This will lead improvement of the textile sector in Portugal, as SME's represents a huge % of the total of the industry in Portugal.
- 5) Large Companies: Large companies should change their mindset and should start to collaborate more with SME in big and innovative projects.

4.2 Proposal of future works

The current trends suggest that being open is worthier now than being closed. It is not possible to remain successful without being innovative, which demands the existence of a level of openness. As the future is more and more open, and there are many activities where companies can act much quicker and more flexible if they are open to outside ideas, being open and collaborative become even more important.

Future works could be:

- Study other players from the textile sector in Portugal.
- Study the textile cluster in Portugal.
- Study other activity sectors, namely the automotive and aeronautics, where open innovation is already a need to survive.
- Study how to change people mindset about open innovation, especially when people are the leaders.
- Study how University faces this theme and how promotes education on this subject.
- Study how knowledge could be shared and developed in R&D just near the SME's and for a concrete situation.

REFERENCES AND OTHER SOURCES OF INFORMATION

5.1 Research papers

5.2 Website

5 REFERENCES AND OTHER SOURCES OF INFORMATION

5.1 Research Papers

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ANNEXES

- 6.1 Interview Guide for Open Innovation
- 6.2 Paula Cadeia perspectives about Questionarie
- 6.3 Sonia Rocha perspectives about Questionarie
- 6.4 Antonia Manuel perspective about Questionarie
- 6.5 Paulo Peixoto perspective about Questionarie
- 6.6 Jose Carlos perspective about Questionarie
- 6.7 Ana Paula perspective about Questionarie
- 6.8 Luis Almeida perspective about Questionarie

6 ANNEXES

6.1 Interview Guide for Open Innovation

INTERVIEW'S BIOGRAPHY DATA:

- Age (years): [18 – 30] [30 – 40] [40 – 50] [+50]
- Gender: (male / female)
- Positioning in the company

INSTITUTE INFORMATION:

- Sector: (Textile / sub-sector):
- Turnover (million euros): [0 – 2] [2 – 10] [10 – 50] [+ 50]
- % of exports:
- Main export markets

INTRODUCTION:

- Tell me about Portugal, Textile and Clothing Industry all over the world and Portugal, Portugal Market, Economic Relation of Portugal?
- Where are you coming from, previous experiences, previous workplaces?
- Do you like to work on this sector? and why?
- Do you think textile sector has more opportunities than other activity sectors? You can give some details about it?
- Tell me about the future of textile and clothing industry? Your prediction about this field?
- What do you think and mean about innovation?

INNOVATION:

- Do you think innovation is important in textile and clothing sector? Tell us how important is?
- How do you feel, does your institute guarantee enough place for innovative ideas? Tell us some of impediments to innovation in your organization?
- How has innovation become engrained in your organization culture and how is it being optimized?
- What technologies, business model and trends will drive the biggest changes in your institute over the next two years?
- Can you share a specific innovation strategy you have recently encountered which you find compelling?

- Does your institute promote innovative ideas coming from outside? For example, from your customers, users, universities, other companies...
- According to your opinion, what are the most important institute features in order to be a successful innovator in the 21st century?

PATH TO OPEN INNOVATION:

- What is driving open innovation in your institute?
- Which issues on open innovation are the most pressing right now at your institute?
- Where do you see open innovation in your institute five years from now?
- How do you define open innovation at your institute?
- In which business functions do you have the most open innovation activity in your institute?
- Are you satisfied with this new innovation philosophy? If you could change, what would you do differently? What would you develop or extend?
- What is the biggest opposite between the old and new innovative thinking?

HOW TO BE OPEN:

- Being open means gaining more innovative ideas either from inside or outside the company, this could lead to more innovations. According to your opinion, what does being open mean for your institute?
- Do you regard your company open? Why?
- What got you to work with open innovation? How do you find inspiration on open innovation practices?
- Do you believe cultural differences have an impact on open innovation? Can you share some examples on this?
- What advice would you give to an innovation leader who has been put in charge of driving open innovation in your institute? What advice would you give to companies that are about to embrace open innovation?
- I believe the future of innovation is open and global. If you agree, what advice would you give to people aspiring to build a career within innovation?

SHARING AND PROTECTING:

- Do you regard your company protective?
- How does your company protect its innovative ideas?
- Are you satisfied with this protection? What would you change?
- If your company tries to open up to the outside world, how do you protect your innovative ideas at the same time?
- How does your company ensure the place for both sharing and protecting?

-
- Do you think it is possible to have both protective and collaborative innovation philosophy at the same time?
 - Which do you think is more important now, being open to everyone, or protecting ideas from competitors? Why?

SMES (SMALL AND MEDIUM ENTERPRISES):

- Why should small companies embrace open innovation? How does this differ from how big companies view open innovation?
- What are the benefits of innovating together with others for small companies? What concerns should small companies have about open innovation?
- Open innovation is very much about ecosystems with several partners. Small companies often take the back seat in such setups. Is this a problem? Are there things small companies can do to level the playing field in such relationships?
- There is a view that small and medium scale industry are not suitable for open innovation? Tell me your view
- In my point of view open innovation is much needed in small and medium scale industry what is your view?

6.2 Paula Cadeia perspectives about Questionnaire

QUESTIONS	5	4	3	2	1	MARKS
GENERAL						
TEXTILE&CLOTHING SECTOR IS IMPORTANT IN PORTUGAL	*					5
CONTRIBUTION OF TEXTILE AND CLOTHING SECTOR IN PORTUGAL MARKET	*					5
DO YOU LIKE THIS SECTOR		*				4
TEXTILE SECTOR HAS MORE IMPORTANT THAN OTHER SECTOR	*					5
FUTURE OF TEXTILE AND CLOTHING SECTOR YOUR PREDECTION	*					5
INNOVATION IS MORE IMPORTANT IN CURRENT SCENARIO	*					5
INNOVATION						
INNOVATION IS IMPORTANT IN TEXTILE AND CLOTHING SECTOR	*					5
IN YOUR INSTITUTION YOU HAVE ENOUGH PLACE FOR INNOVATIVE IDEAS	*					5
INNOVATION HAS INFLUENCE YOUR ORGANIZATION CULTURE		*				4
INNOVATION STRATEGY YOU HAVE RECENTLY ENCOUNTERED		*				4
INSTITUTE PROMOTE INNOVATIVE IDEAS FROM OUTSIDE			*			3
TO RUN SUCCESSFUL ORGANIZATION IN 21 ST CENTURY YOU THINK TO PROMOTE INNOVATIVE IDEAS FROM OTHERS	*					5
PATH TO OPEN INNOVATION						
OPEN INNOVATION INFLUENCE YOUR ORGANIZATION		*				4
LAST FIVE YEARS HOW OPEN INNOVATION INFLUENCE YOUR INSTITUTE			*			3
OPEN INNOVATION ACTIVITY HAS MORE INFLUENCE YOUR BUSINESS FUNCTION		*				4
SATISFIED WITH NEW INNOVATION PHILOSOPHY	*					5
OPPOSITE BETWEEN THE OLD AND NEW INNOVATION THINKING	*					5
HOW TO BE OPEN						
OPEN MEANS GAINING INNOVATIVE IDEAS FORM OUTSIDE OR INSIDE THE COMPANY THIS LEAD TO OPEN INNOVATION		*				4
YOU REGARD YOUR COMPANY OPEN	*					5
WORKING WITH OPEN INNOVATION	*					5
CULTURAL DIFFERENCE HAVE AN IMPACT ON OPEN INNOVATION	*					5
IMPORTANCE OF OPEN INNOVATION LEADER IN A COMPANY	*					5
FUTURE OF INNOVATION IS OPEN AND GLOBAL DO YOU AGREE		*				4
SHARING AND PROTECTING						
DO YOU REGARD YOUR COMPANY PROTECTIVE	*					5
YOUR COMPANY PROTECT ITS INNOVATIVE IDEAS			*			3
YOU SATISFIED WITH THIS PROTECTION	*					5
COMPANY TRIES TO OPEN UP TO THE OUTSIDE WORLD, HOW TO PROTECT YOUR INNOVATIVE IDEAS AT THE SAME TIME		*				4
YOUR COMPANY ENSURE THE PLACE FOR BOTH SHARING AND PROTECTING		*				4
IT IS POSSIBLE TO HAVE BOTH PROTECTIVE AND COLLABORATIVE INNOVATION PHILOSOPHY AT THE SAME TIME	*					5

DO YOU THINK IS MORE IMPORTANT NOW, BEING OPEN TO EVERYONE OR PROTECTING IDEAS FROM COMPETITORS		*				4
SME (SMALL AND MEDIUM ENTERPRISES)						
SMALL COMPANIES SHOULD EMBRACE OPEN INNOVATION		*				4
BENEFITS OF INNOVATING TOGETHER WITH OTHER SMALL COMPANIES		*				4
SMALL AND MEDIUM INDUSTRY ARE SUITABLE FOR OPEN INNOVATION	*					5
IN MY POINT OF VIEW OPEN INNOVATION IS MUCH NEEDED IN SMALL AND MEDIUM INDUSTRY WHAT IS YOUR VIEW	*					5
OPEN INNOVATION IS VERY MUCH ABOUT ECOSYSTEMS WITH SEVERAL PARTNERS. SMALL COMPANIES OFTEN TAKE THE BACK SEAT IN SUCH SETUPS. IS THIS A PROBLEM	*					5

Annexure 1 – Paula Cadeia perspective about Questionarie.

6.3 Sonia Rocha perspectives about Questionarie

QUESTIONS	5	4	3	2	1	MARKS
GENERAL						
TEXTILE&CLOTHING SECTOR IS IMPORTANT IN PORTUGAL	*					5
CONTRIBUTION OF TEXTILE AND CLOTHING SECTOR IN PORTUGAL MARKET	*					5
DO YOU LIKE THIS SECTOR		*				4
TEXTILE SECTOR HAS MORE IMPORTANT THAN OTHER SECTOR	*					5
FUTURE OF TEXTILE AND CLOTHING SECTOR YOUR PREDECTION		*				4
INNOVATION IS MORE IMPORTANT IN CURRENT SCENARIO	*					5
INNOVATION						
INNOVATION IS IMPORTANT IN TEXTILE AND CLOTHING SECTOR	*					5
IN YOUR INSTITUTION YOU HAVE ENOUGH PLACE FOR INNOVATIVE IDEAS			*			3
INNOVATION HAS INFLUENCE YOUR ORGANIZATION CULTURE			*			3
INNOVATION STRATEGY YOU HAVE RECENTLY ENCOUNTERED			*			3
INSTITUTE PROMOTE INNOVATIVE IDEAS FROM OUTSIDE				*		2
TO RUN SUCCESSFUL ORGANIZATION IN 21 ST CENTURY YOU THINK TO PROMOTE INNOVATIVE IDEAS FROM OTHERS		*				5
PATH TO OPEN INNOVATION						
OPEN INNOVATION INFLUENCE YOUR ORGANIZATION			*			3
LAST FIVE YEARS HOW OPEN INNOVATION INFLUENCE YOUR INSTITUTE			*			3
OPEN INNOVATION ACTIVITY HAS MORE INFLUENCE YOUR BUSINESS FUNCTION		*				4
SATISFIED WITH NEW INNOVATION PHILOSOPHY	*					5
OPPOSITE BETWEEN THE OLD AND NEW INNOVATION THINKING	*					5
HOW TO BE OPEN						
OPEN MEANS GAINING INNOVATIVE IDEAS FORM OUTSIDE OR INSIDE THE COMPANY THIS LEAD TO OPEN INNOVATION			*			4
YOU REGARD YOUR COMPANY OPEN			*			4
WORKING WITH OPEN INNOVATION			*			4
CULTURAL DIFFERENCE HAVE AN IMPACT ON OPEN INNOVATION			*			4
IMPORTANCE OF OPEN INNOVATION LEADER IN A COMPANY	*					5
FUTURE OF INNOVATION IS OPEN AND GLOBAL DO YOU AGREE	*					5
SHARING AND PROTECTING						
DO YOU REGARD YOUR COMPANY PROTECTIVE				*		3
YOUR COMPANY PROTECT ITS INNOVATIVE IDEAS				*		3
YOU SATISFIED WITH THIS PROTECTION				*		3
COMPANY TRIES TO OPEN UP TO THE OUTSIDE WORLD, HOW TO PROTECT YOUR INNOVATIVE IDEAS AT THE SAME TIME				*		3
YOUR COMPANY ENSURE THE PLACE FOR BOTH SHARING AND PROTECTING				*		3
IT IS POSSIBLE TO HAVE BOTH PROTECTIVE AND COLLABORATIVE INNOVATION PHILOSOPHY AT THE SAME TIME		*				4

DO YOU THINK IS MORE IMPORTANT NOW, BEING OPEN TO EVERYONE OR PROTECTING IDEAS FROM COMPETITORS		*				4
SME (SMALL AND MEDIUM ENTERPRISES)						
SMALL COMPANIES SHOULD EMBRACE OPEN INNOVATION		*				4
BENEFITS OF INNOVATING TOGETHER WITH OTHER SMALL COMPANIES		*				4
SMALL AND MEDIUM INDUSTRY ARE SUITABLE FOR OPEN INNOVATION		*				4
IN MY POINT OF VIEW OPEN INNOVATION IS MUCH NEEDED IN SMALL AND MEDIUM INDUSTRY WHAT IS YOUR VIEW		*				4
OPEN INNOVATION IS VERY MUCH ABOUT ECOSYSTEMS WITH SEVERAL PARTNERS. SMALL COMPANIES OFTEN TAKE THE BACK SEAT IN SUCH SETUPS. IS THIS A PROBLEM		*				4

Annexure 2 – Sonia Rocha perspective about Questionnaire.

6.4 Antonia Manuel perspective about Questionarie

QUESTIONS	5	4	3	2	1	MARKS
GENERAL						
TEXTILE&CLOTHING SECTOR IS IMPORTANT IN PORTUGAL	*					5
CONTRIBUTION OF TEXTILE AND CLOTHING SECTOR IN PORTUGAL MARKET	*					5
DO YOU LIKE THIS SECTOR		*				4
TEXTILE SECTOR HAS MORE IMPORTANT THAN OTHER SECTOR	*					5
FUTURE OF TEXTILE AND CLOTHING SECTOR YOUR PREDECTION	*					5
INNOVATION IS MORE IMPORTANT IN CURRENT SCENARIO	*					5
INNOVATION						
INNOVATION IS IMPORTANT IN TEXTILE AND CLOTHING SECTOR	*					5
IN YOUR INSTITUTION YOU HAVE ENOUGH PLACE FOR INNOVATIVE IDEAS		*				4
INNOVATION HAS INFLUENCE YOUR ORGANIZATION CULTURE			*			3
INNOVATION STRATEGY YOU HAVE RECENTLY ENCOUNTERED		*				4
INSTITUTE PROMOTE INNOVATIVE IDEAS FROM OUTSIDE		*				4
TO RUN SUCCESSFUL ORGANIZATION IN 21 ST CENTURY YOU THINK TO PROMOTE INNOVATIVE IDEAS FROM OTHERS	*					5
PATH TO OPEN INNOVATION						
OPEN INNOVATION INFLUENCE YOUR ORGANIZATION		*				4
LAST FIVE YEARS HOW OPEN INNOVATION INFLUENCE YOUR INSTITUTE				*		2
OPEN INNOVATION ACTIVITY HAS MORE INFLUENCE YOUR BUSINESS FUNCTION		*				4
SATISFIED WITH NEW INNOVATION PHILOSOPHY	*					5
OPPOSITE BETWEEN THE OLD AND NEW INNOVATION THINKING	*					5
HOW TO BE OPEN						
OPEN MEANS GAINING INNOVATIVE IDEAS FORM OUTSIDE OR INSIDE THE COMPANY THIS LEAD TO OPEN INNOVATION		*				4
YOU REGARD YOUR COMPANY OPEN	*					5
WORKING WITH OPEN INNOVATION		*				4
CULTURAL DIFFERENCE HAVE AN IMPACT ON OPEN INNOVATION		*				4
IMPORTANCE OF OPEN INNOVATION LEADER IN A COMPANY	*					5
FUTURE OF INNOVATION IS OPEN AND GLOBAL DO YOU AGREE		*				4
SHARING AND PROTECTING						
DO YOU REGARD YOUR COMPANY PROTECTIVE		*				4
YOUR COMPANY PROTECT ITS INNOVATIVE IDEAS		*				4
YOU SATISFIED WITH THIS PROTECTION	*					5
COMPANY TRIES TO OPEN UP TO THE OUTSIDE WORLD, HOW TO PROTECT YOUR INNOVATIVE IDEAS AT THE SAME TIME		*				4
YOUR COMPANY ENSURE THE PLACE FOR BOTH SHARING AND PROTECTING		*				4
IT IS POSSIBLE TO HAVE BOTH PROTECTIVE AND COLLABORATIVE INNOVATION PHILOSOPHY AT THE SAME TIME	*					5

DO YOU THINK IS MORE IMPORTANT NOW, BEING OPEN TO EVERYONE OR PROTECTING IDEAS FROM COMPETITORS		*				4
SME (SMALL AND MEDIUM ENTERPRISES)						
SMALL COMPANIES SHOULD EMBRACE OPEN INNOVATION			*			3
BENEFITS OF INNOVATING TOGETHER WITH OTHER SMALL COMPANIES			*			3
SMALL AND MEDIUM INDUSTRY ARE SUITABLE FOR OPEN INNOVATION		*				4
IN MY POINT OF VIEW OPEN INNOVATION IS MUCH NEEDED IN SMALL AND MEDIUM INDUSTRY WHAT IS YOUR VIEW		*				4
OPEN INNOVATION IS VERY MUCH ABOUT ECOSYSTEMS WITH SEVERAL PARTNERS. SMALL COMPANIES OFTEN TAKE THE BACK SEAT IN SUCH SETUPS. IS THIS A PROBLEM		*				4

Annexure 3 – Antonia Manuel perspective about Questionarie.

6.5 Paulo Peixoto perspective about Questionarie

QUESTIONS	5	4	3	2	1	MARKS
GENERAL						
TEXTILE&CLOTHING SECTOR IS IMPORTANT IN PORTUGAL	*					5
CONTRIBUTION OF TEXTILE AND CLOTHING SECTOR IN PORTUGAL MARKET	*					5
DO YOU LIKE THIS SECTOR		*				4
TEXTILE SECTOR HAS MORE IMPORTANT THAN OTHER SECTOR	*					5
FUTURE OF TEXTILE AND CLOTHING SECTOR YOUR PREDECTION	*					5
INNOVATION IS MORE IMPORTANT IN CURRENT SCENARIO	*					5
INNOVATION						
INNOVATION IS IMPORTANT IN TEXTILE AND CLOTHING SECTOR	*					5
IN YOUR INSTITUTION YOU HAVE ENOUGH PLACE FOR INNOVATIVE IDEAS	*					5
INNOVATION HAS INFLUENCE YOUR ORGANIZATION CULTURE		*				4
INNOVATION STRATEGY YOU HAVE RECENTLY ENCOUNTERED		*				4
INSTITUTE PROMOTE INNOVATIVE IDEAS FROM OUTSIDE		*				4
TO RUN SUCCESSFUL ORGANIZATION IN 21 ST CENTURY YOU THINK TO PROMOTE INNOVATIVE IDEAS FROM OTHERS	*					5
PATH TO OPEN INNOVATION		*				4
OPEN INNOVATION INFLUENCE YOUR ORGANIZATION		*				4
LAST FIVE YEARS HOW OPEN INNOVATION INFLUENCE YOUR INSTITUTE		*				4
OPEN INNOVATION ACTIVITY HAS MORE INFLUENCE YOUR BUSINESS FUNCTION		*				4
SATISFIED WITH NEW INNOVATION PHILOSOPHY	*					5
OPPOSITE BETWEEN THE OLD AND NEW INNOVATION THINKING	*					5
HOW TO BE OPEN						
OPEN MEANS GAINING INNOVATIVE IDEAS FORM OUTSIDE OR INSIDE THE COMPANY THIS LEAD TO OPEN INNOVATION		*				4
YOU REGARD YOUR COMPANY OPEN		*				4
WORKING WITH OPEN INNOVATION		*				4
CULTURAL DIFFERENCE HAVE AN IMPACT ON OPEN INNOVATION		*				4
IMPORTANCE OF OPEN INNOVATION LEADER IN A COMPANY	*					5
FUTURE OF INNOVATION IS OPEN AND GLOBAL DO YOU AGREE	*					5
SHARING AND PROTECTING						
DO YOU REGARD YOUR COMPANY PROTECTIVE			*			3
YOUR COMPANY PROTECT ITS INNOVATIVE IDEAS			*			3
YOU SATISFIED WITH THIS PROTECTION			*			3
COMPANY TRIES TO OPEN UP TO THE OUTSIDE WORLD, HOW TO PROTECT YOUR INNOVATIVE IDEAS AT THE SAME TIME		*				4
YOUR COMPANY ENSURE THE PLACE FOR BOTH SHARING AND PROTECTING		*				4
IT IS POSSIBLE TO HAVE BOTH PROTECTIVE AND COLLABORATIVE INNOVATION PHILOSOPHY AT THE SAME TIME	*					5

DO YOU THINK IS MORE IMPORTANT NOW, BEING OPEN TO EVERYONE OR PROTECTING IDEAS FROM COMPETITORS	*					5
SME (SMALL AND MEDIUM ENTERPRISES)						
SMALL COMPANIES SHOULD EMBRACE OPEN INNOVATION		*				4
BENEFITS OF INNOVATING TOGETHER WITH OTHER SMALL COMPANIES		*				4
SMALL AND MEDIUM INDUSTRY ARE SUITABLE FOR OPEN INNOVATION	*					5
IN MY POINT OF VIEW OPEN INNOVATION IS MUCH NEEDED IN SMALL AND MEDIUM INDUSTRY WHAT IS YOUR VIEW	*					5
OPEN INNOVATION IS VERY MUCH ABOUT ECOSYSTEMS WITH SEVERAL PARTNERS. SMALL COMPANIES OFTEN TAKE THE BACK SEAT IN SUCH SETUPS. IS THIS A PROBLEM	*					5

Annexure 4 – Paulo Peixoto perspective about Questionarie.

6.6 Jose Carlos perspective about Questionarie

QUESTIONS	5	4	3	2	1	MARKS
GENERAL						
TEXTILE&CLOTHING SECTOR IS IMPORTANT IN PORTUGAL	*					5
CONTRIBUTION OF TEXTILE AND CLOTHING SECTOR IN PORTUGAL MARKET	*					5
DO YOU LIKE THIS SECTOR		*				4
TEXTILE SECTOR HAS MORE IMPORTANT THAN OTHER SECTOR	*					5
FUTURE OF TEXTILE AND CLOTHING SECTOR YOUR PREDECTION	*					5
INNOVATION IS MORE IMPORTANT IN CURRENT SCENARIO	*					5
INNOVATION						
INNOVATION IS IMPORTANT IN TEXTILE AND CLOTHING SECTOR	*					5
IN YOUR INSTITUTION YOU HAVE ENOUGH PLACE FOR INNOVATIVE IDEAS	*					5
INNOVATION HAS INFLUENCE YOUR ORGANIZATION CULTURE		*				4
INNOVATION STRATEGY YOU HAVE RECENTLY ENCOUNTERED		*				4
INSTITUTE PROMOTE INNOVATIVE IDEAS FROM OUTSIDE		*				4
TO RUN SUCCESSFUL ORGANIZATION IN 21 ST CENTURY YOU THINK TO PROMOTE INNOVATIVE IDEAS FROM OTHERS	*					5
PATH TO OPEN INNOVATION						
OPEN INNOVATION INFLUENCE YOUR ORGANIZATION		*				4
LAST FIVE YEARS HOW OPEN INNOVATION INFLUENCE YOUR INSTITUTE		*				4
OPEN INNOVATION ACTIVITY HAS MORE INFLUENCE YOUR BUSINESS FUNCTION		*				4
SATISFIED WITH NEW INNOVATION PHILOSOPHY	*					5
OPPOSITE BETWEEN THE OLD AND NEW INNOVATION THINKING	*					5
HOW TO BE OPEN						
OPEN MEANS GAINING INNOVATIVE IDEAS FORM OUTSIDE OR INSIDE THE COMPANY THIS LEAD TO OPEN INNOVATION		*				4
YOU REGARD YOUR COMPANY OPEN		*				4
WORKING WITH OPEN INNOVATION		*				4
CULTURAL DIFFERENCE HAVE AN IMPACT ON OPEN INNOVATION		*				4
IMPORTANCE OF OPEN INNOVATION LEADER IN A COMPANY	*					5
FUTURE OF INNOVATION IS OPEN AND GLOBAL DO YOU AGREE	*					5
SHARING AND PROTECTING						
DO YOU REGARD YOUR COMPANY PROTECTIVE			*			3
YOUR COMPANY PROTECT ITS INNOVATIVE IDEAS			*			3
YOU SATISFIED WITH THIS PROTECTION			*			3
COMPANY TRIES TO OPEN UP TO THE OUTSIDE WORLD, HOW TO PROTECT YOUR INNOVATIVE IDEAS AT THE SAME TIME		*				4
YOUR COMPANY ENSURE THE PLACE FOR BOTH SHARING AND PROTECTING		*				4
IT IS POSSIBLE TO HAVE BOTH PROTECTIVE AND COLLABORATIVE INNOVATION PHILOSOPHY AT THE SAME TIME	*					5

DO YOU THINK IS MORE IMPORTANT NOW, BEING OPEN TO EVERYONE OR PROTECTING IDEAS FROM COMPETITORS	*				5
SME (SMALL AND MEDIUM ENTERPRISES)					
SMALL COMPANIES SHOULD EMBRACE OPEN INNOVATION	*				4
BENEFITS OF INNOVATING TOGETHER WITH OTHER SMALL COMPANIES	*				4
SMALL AND MEDIUM INDUSTRY ARE SUITABLE FOR OPEN INNOVATION	*				4
IN MY POINT OF VIEW OPEN INNOVATION IS MUCH NEEDED IN SMALL AND MEDIUM INDUSTRY WHAT IS YOUR VIEW	*				4
OPEN INNOVATION IS VERY MUCH ABOUT ECOSYSTEMS WITH SEVERAL PARTNERS. SMALL COMPANIES OFTEN TAKE THE BACK SEAT IN SUCH SETUPS. IS THIS A PROBLEM	*				4

Annexure 5 – Jose Carlos perspective about Questionarie.

6.7 Ana Paula perspective about Questionarie

QUESTIONS	5	4	3	2	1	MARKS
GENERAL						
TEXTILE&CLOTHING SECTOR IS IMPORTANT IN PORTUGAL	*					5
CONTRIBUTION OF TEXTILE AND CLOTHING SECTOR IN PORTUGAL MARKET	*					5
DO YOU LIKE THIS SECTOR		*				4
TEXTILE SECTOR HAS MORE IMPORTANT THAN OTHER SECTOR	*					5
FUTURE OF TEXTILE AND CLOTHING SECTOR YOUR PREDECTION	*					5
INNOVATION IS MORE IMPORTANT IN CURRENT SCENARIO	*					5
INNOVATION						
INNOVATION IS IMPORTANT IN TEXTILE AND CLOTHING SECTOR	*					5
IN YOUR INSTITUTION YOU HAVE ENOUGH PLACE FOR INNOVATIVE IDEAS	*					5
INNOVATION HAS INFLUENCE YOUR ORGANIZATION CULTURE		*				4
INNOVATION STRATEGY YOU HAVE RECENTLY ENCOUNTERED		*				4
INSTITUTE PROMOTE INNOVATIVE IDEAS FROM OUTSIDE		*				4
TO RUN SUCCESSFUL ORGANIZATION IN 21 ST CENTURY YOU THINK TO PROMOTE INNOVATIVE IDEAS FROM OTHERS	*					5
PATH TO OPEN INNOVATION		*				4
OPEN INNOVATION INFLUENCE YOUR ORGANIZATION		*				4
LAST FIVE YEARS HOW OPEN INNOVATION INFLUENCE YOUR INSTITUTE		*				4
OPEN INNOVATION ACTIVITY HAS MORE INFLUENCE YOUR BUSINESS FUNCTION		*				4
SATISFIED WITH NEW INNOVATION PHILOSOPHY	*					5
OPPOSITE BETWEEN THE OLD AND NEW INNOVATION THINKING	*					5
HOW TO BE OPEN						
OPEN MEANS GAINING INNOVATIVE IDEAS FORM OUTSIDE OR INSIDE THE COMPANY THIS LEAD TO OPEN INNOVATION		*				4
YOU REGARD YOUR COMPANY OPEN		*				4
WORKING WITH OPEN INNOVATION		*				4
CULTURAL DIFFERENCE HAVE AN IMPACT ON OPEN INNOVATION		*				4
IMPORTANCE OF OPEN INNOVATION LEADER IN A COMPANY	*					5
FUTURE OF INNOVATION IS OPEN AND GLOBAL DO YOU AGREE	*					5
SHARING AND PROTECTING						
DO YOU REGARD YOUR COMPANY PROTECTIVE			*			3
YOUR COMPANY PROTECT ITS INNOVATIVE IDEAS			*			3
YOU SATISFIED WITH THIS PROTECTION			*			3
COMPANY TRIES TO OPEN UP TO THE OUTSIDE WORLD, HOW TO PROTECT YOUR INNOVATIVE IDEAS AT THE SAME TIME		*				4
YOUR COMPANY ENSURE THE PLACE FOR BOTH SHARING AND PROTECTING		*				4
IT IS POSSIBLE TO HAVE BOTH PROTECTIVE AND COLLABORATIVE INNOVATION PHILOSOPHY AT THE SAME TIME	*					5

DO YOU THINK IS MORE IMPORTANT NOW, BEING OPEN TO EVERYONE OR PROTECTING IDEAS FROM COMPETITORS	*					5
SME (SMALL AND MEDIUM ENTERPRISES)						
SMALL COMPANIES SHOULD EMBRACE OPEN INNOVATION				*		2
BENEFITS OF INNOVATING TOGETHER WITH OTHER SMALL COMPANIES				*		2
SMALL AND MEDIUM INDUSTRY ARE SUITABLE FOR OPEN INNOVATION				*		2
IN MY POINT OF VIEW OPEN INNOVATION IS MUCH NEEDED IN SMALL AND MEDIUM INDUSTRY WHAT IS YOUR VIEW				*		2
OPEN INNOVATION IS VERY MUCH ABOUT ECOSYSTEMS WITH SEVERAL PARTNERS. SMALL COMPANIES OFTEN TAKE THE BACK SEAT IN SUCH SETUPS. IS THIS A PROBLEM				*		2

Annexure 6 – Ana Paulo perspective about Questionarie.

6.8 Luis Almeida perspective about Questionnaire

QUESTIONS	5	4	3	2	1	MARKS
GENERAL						
TEXTILE&CLOTHING SECTOR IS IMPORTANT IN PORTUGAL	*					5
CONTRIBUTION OF TEXTILE AND CLOTHING SECTOR IN PORTUGAL MARKET	*					5
DO YOU LIKE THIS SECTOR		*				4
TEXTILE SECTOR HAS MORE IMPORTANT THAN OTHER SECTOR	*					5
FUTURE OF TEXTILE AND CLOTHING SECTOR YOUR PREDECTION	*					5
INNOVATION IS MORE IMPORTANT IN CURRENT SCENARIO	*					5
INNOVATION						
INNOVATION IS IMPORTANT IN TEXTILE AND CLOTHING SECTOR	*					5
IN YOUR INSTITUTION YOU HAVE ENOUGH PLACE FOR INNOVATIVE IDEAS		*				4
INNOVATION HAS INFLUENCE YOUR ORGANIZATION CULTURE			*			3
INNOVATION STRATEGY YOU HAVE RECENTLY ENCOUNTERED		*				4
INSTITUTE PROMOTE INNOVATIVE IDEAS FROM OUTSIDE		*				4
TO RUN SUCCESSFUL ORGANIZATION IN 21 ST CENTURY YOU THINK TO PROMOTE INNOVATIVE IDEAS FROM OTHERS	*					5
PATH TO OPEN INNOVATION						
OPEN INNOVATION INFLUENCE YOUR ORGANIZATION		*				4
LAST FIVE YEARS HOW OPEN INNOVATION INFLUENCE YOUR INSTITUTE				*		2
OPEN INNOVATION ACTIVITY HAS MORE INFLUENCE YOUR BUSINESS FUNCTION		*				4
SATISFIED WITH NEW INNOVATION PHILOSOPHY	*					5
OPPOSITE BETWEEN THE OLD AND NEW INNOVATION THINKING	*					5
HOW TO BE OPEN						
OPEN MEANS GAINING INNOVATIVE IDEAS FORM OUTSIDE OR INSIDE THE COMPANY THIS LEAD TO OPEN INNOVATION		*				4
YOU REGARD YOUR COMPANY OPEN	*					5
WORKING WITH OPEN INNOVATION		*				4
CULTURAL DIFFERENCE HAVE AN IMPACT ON OPEN INNOVATION		*				4
IMPORTANCE OF OPEN INNOVATION LEADER IN A COMPANY	*					5
FUTURE OF INNOVATION IS OPEN AND GLOBAL DO YOU AGREE		*				4
SHARING AND PROTECTING						
DO YOU REGARD YOUR COMPANY PROTECTIVE		*				4
YOUR COMPANY PROTECT ITS INNOVATIVE IDEAS		*				4
YOU SATISFIED WITH THIS PROTECTION	*					5
COMPANY TRIES TO OPEN UP TO THE OUTSIDE WORLD, HOW TO PROTECT YOUR INNOVATIVE IDEAS AT THE SAME TIME		*				4
YOUR COMPANY ENSURE THE PLACE FOR BOTH SHARING AND PROTECTING		*				4
IT IS POSSIBLE TO HAVE BOTH PROTECTIVE AND COLLABORATIVE INNOVATION PHILOSOPHY AT THE SAME TIME	*					5

DO YOU THINK IS MORE IMPORTANT NOW, BEING OPEN TO EVERYONE OR PROTECTING IDEAS FROM COMPETITORS		*			4
SME (SMALL AND MEDIUM ENTERPRISES)					
SMALL COMPANIES SHOULD EMBRACE OPEN INNOVATION			*		3
BENEFITS OF INNOVATING TOGETHER WITH OTHER SMALL COMPANIES			*		3
SMALL AND MEDIUM INDUSTRY ARE SUITABLE FOR OPEN INNOVATION		*			4
IN MY POINT OF VIEW OPEN INNOVATION IS MUCH NEEDED IN SMALL AND MEDIUM INDUSTRY WHAT IS YOUR VIEW		*			4
OPEN INNOVATION IS VERY MUCH ABOUT ECOSYSTEMS WITH SEVERAL PARTNERS. SMALL COMPANIES OFTEN TAKE THE BACK SEAT IN SUCH SETUPS. IS THIS A PROBLEM		*			4

Annexure 7 – Luis Almeida perspective about Questionnaire.