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**Business Model Architecture for Project-based Firms**

*Mário Trigo Cortez Pereira*

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Orientador na FEUP: Professor Doutor José Manuel Mendonça



**Faculdade de Engenharia da Universidade do Porto**

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*To Francisca, José Eduardo and Teresa Maria*

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### **Abstract**

The service sector is growing worldwide and project design is following the same growing path. Projects have to be designed to meet an ever increasing demand in size and complexity and project-based firms are challenged to design those projects and to support project design and project development. This dissertation is a research study on how to build a business model supporting the referred project-based firms in an innovative way. The field work undertaken with three case studies has complemented the authors experience to build that model with a very practical perspective rather than relying exclusively on theory. Major issues addressed are the inefficiencies and losses that occur along project development, and the lack of scope of the knowledge areas used along project design. How to explore those two issues is the core problem tackled by the dissertation analysis.

A business model and a process map are proposed to define the multilevel architecture of the project-based firm. The project-based firm is integrated in a networking environment and a project aggregates and aligns the contributions many actors involved. The business model therefore covers an integrated vision of project design and includes novel information system dimensions to strengthen innovation.

**Key Words: Project-based Firms, Business Model, Project Design, Project Management**

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**List of Acronymus**

Acronymus	Descripton
AaaS	Assist as a Service
AIA	American Institute Architects
ARIS	ARchitecture of Information Systems
B2B	Business to Business
B2C	Business to Customer
BMC	Business Model Canvas
BPM	Business Process Model
CEO	Chief Executive Officer
CFO	Chief Financial Officer
CO	Chief Officer
CRM	Customer Relationship Management or Manager
ECOBOM	ECOBOM, SA
ERP	Enterprise Resource Planning
GNP	Gross National Product
HRM	Human Resources Management or Manager
IBM	International Business Machines
IPD	Integrated Project Delivery
IS	Information Systems
IT	InformationTechnology
KPI	Key Performance Indicators
MATISANA	Matisana, mineral water from Mozambique
MoU	Memorandum of Understanding
PAMPILAR	PAMPILAR Papeis de Portugal, Lda
PM	Project Management or Project Manager
PMBOK	Project Management Body of Knowledge
SAP	Systems, Aplications and Products (in German)
SME	Small and Medium Enterprises
SOPSEC	Sociedade de Prestação de Serviçosed Engenharia Civil, SA
SWOT	Strength, Weakness, Opportunity, Threats



## 1 Introduction

This dissertation follows a standard organisation. Its purpose is to define a business model architecture that will be able to support a service in project management design and development. The research domain scope encompasses three areas: Business Models, Project Management and New Service Design. The state of the art and literature review on those three areas form the second chapter of the dissertation.

The third chapter of the dissertation focus on the problem and on the research questions. Many projects are developed and are unsuccessful or are not as successful as they could be, because either they do not benefit from the complete or required scope of project management knowledge areas or they waste resources and loose efficiency along the different phases of project design and development. The problem is how to address each one of these two issues. This is done through data collection from real-life cases and relying on the author's professional experience. To close the chapter, four research questions are raised.

The fourth chapter deals with design of data collection, data collection and data analysis. The main purposes of data collection are discussed. Data collection was carried out through interviews with an "as is" business model being presented for each company interviewed. Data analysis is synthesized at the end, through a group of business indicators. This has been an enriching process that, once again, together with the professional experience of the author, was most valuable in supporting the design of the business model architecture.

The fifth chapter is the proposal of a Business Model Architecture for Project-based Firms. In this chapter the first three – interlinked - research questions are answered and the multilevel model is presented. The final chapter presents the main conclusions that can be drawn from the work as well as some new developments which are suggested under the theme of the dissertation.

## 2 State of the Art

### 2.1 Business Model

#### OVERVIEW

Many authors refer that there is not a single definition of what a business model is. Although business models exist since long, the concept has been more used since 1950's however, as we know them today it is only after the emergence of internet in the mid 1990's (Teece 2010; Zott, Amit, and Massa 2011) that they have acquired relevance. Somehow business models had a fast development together with IT tools. For most authors there is a general agreement that business models purpose concerns three main business aspects: (1) strategy; (2) value capture and value creation and; (3) organizational structure.

To start with, it is necessary to find a model or more than one model, enabling to structure the global idea of the new service business. In this work, an existing model will be used as a framework that will be filled in with content related to the business of managing entrepreneurial projects.

The literature review mostly shows examples of models of large multinational firms (Chesbrough 2010; Keen and Qureshi 2006; Osterwalder, Pigneur, and Tucci 2005) mainly from USA, sometimes from Europe and from Japan. Also, in the large majority of the cases they focus on manufacturing companies or on companies that have large information systems, such as product based companies or companies with strong IT core activities. In short are far from covering small or medium enterprises as it is the case of this dissertation. Nevertheless, there is only one global business environment and all businesses have to fit in it regardless of the size or type of the firm. Business sub environments can be considered as well as different ways of doing business and the literature review shows that concepts, ideas, findings and conclusions do contribute to the development of new projects and can be obtained from literature. The present work focus specifically on aspects related to project-based companies, firms or organizations businesses.

#### PROJECT-BASED

The focus of this dissertation will be the assessment of project management in project-based companies as well as in project-based businesses. Project-based businesses follow their own business model which, as expected, differs from other business models. Every project-based business is customized, co-created, has its specific complexity, its own value creation, relates to a specific context, has a time limit to be achieved and usually can hardly be standardized (Wikström et al. 2010). The differentiated and customized nature of the project-based demand, calls for service co-creation with customers, including negotiation among project stake holders, and inherently calls for innovation to services (Hobday 1998; Sydow, Lindkvist, and DeFillippi 2004). Another most relevant feature is system integration - the cooperation among knowledge areas of a project. It is in fact a "core capability" of project-based organizations – whose activities most too often cross their boundaries (Wikström et al. 2010). Activities are engagements of all type of resources that project stakeholders integrate (Zott and Amit 2010).

In (Sydow, Lindkvist, and DeFillippi 2004, 2), a paper that deals specifically with project-based businesses, “Lindkvist (2004) identifies as project-based firms those companies that do most of their work in projects and/or have a main emphasis on the project dimensions rather than on the functional dimensions of an organizational structure and processes.” In Project-based organizations, the main activity is to develop projects for different customers which is clearly different from project-led organizations that do exist to develop a single project and terminate when that project ends. According to (Blindenbach-Driessen and van den Ende 2006), projects can be seen either as business projects or development projects. In this later case, when the project is successful, a change takes place and a new player is introduced in the market. The concept and the idea of Servitization (Vandermerwe and Rada 1989) can be included in project-based firms as part of their businesses. Servitization and long term commitments are somehow together.

In project-based businesses two types of tension have been identified as they occur (Sydow, Lindkvist, and DeFillippi 2004). One emerges from the autonomy of project stakeholder participation in a decentralized environment. Relevant issues are the way of organizing activities and the integration of each stakeholder participation in the project development with other stakeholders and with project management. The second and important tension relates to how the know-how generated during the project development can be stored for utilization in future projects. Some authors consider that customized projects are always different from each other's and do not create added value to be added for future projects. Others consider that economies of repetition do exist. Still following the same reference, these tensions can be solved if the project can be developed at different levels, taking into consideration different business contexts. The quest is how business models can cope with these tensions and how knowledge can be captured and retained, with an effective transfer from one project to another, when dealing with a network of project-based firms. A complementary perspective is presented by (Bosch-Sijtsema and Postma 2004): they discuss on how can knowledge be transferred and circulating from one firm to another through Project-based Organizations that are linked in networks, these networks that have temporary characteristics with interdependent relationships, raising the importance of communication and governance, in order to obtain innovative results.

Another question that is valid for project-based organizations, but not restricted to them, relates to the fact that more and more customers are not only concerned with the investment associated to a project but they are also concerned with project performance during the phase of utilization of that project (Kujala et al. 2010). There are advantages of that new perspective as “by occupying a larger share and responsibility of the customers' businesses, project suppliers are also given the possibility of capturing a larger portion of the overall value stream and to gain more profits (Sydow, Lindkvist, and DeFillippi 2004)” (Kujala et al. 2010, 97). It is also relevant to invest more on a project design to obtain a cheaper solution for the short and the long term.

In the development of an organization, project activities should be defined at different levels (Zott and Amit 2010). In a project-based organization a business model for a firm and business model at the solution-level may coexist meaning that different business models can be built for one firm. However the adequate level for the business model of a project-based firm is distinct from the model of a project being developed by that organization.

### **BUSINESS MODEL INNOVATION**

The literature also analyses the relationship between business models and firm performance. The main issue is how business models are helpful to innovate and increase performance in organizations and firms. “Our research shows that new and innovative business models can succeed independent of a company’s age, industry, or geography”(Giesen et al. 2007, 4) and also “(1) each type of business model innovation can generate success, and (2) innovation in enterprise models that focuses on external collaboration and partnerships is particularly effective in older companies as compared to younger ones”.(Zott, Amit, and Massa 2011, 12). Both findings are relevant in what regards the objective of the present dissertation, despite that, statistically most of new start-up businesses eventually fail.

Successful innovative business models, have “Three As” characteristics according to (Giesen et al. 2007, 4):

“Aligned – Leverage core capabilities and design consistency across all dimensions of the business model, both internally and externally, that build customer value.” Alignment in internal as well as external terms for all project stakeholders - is important in all dimensions of the model.

“Analytical – Use information strategically to create foresight, and prioritize actions while measuring and tracking for rapid course correction.” That is an area where Key Performance indicators (KPI’s) might be useful in strategic, financial, project performance, information and customer knowledge.

“Adaptable – Link innovative leadership to enhance the ability to effect change and institutionalize operational flexibility”. This means meeting the needs of a flexible and at all levels dynamic and changeable organization. Innovation has a large development by (Blindenbach-Driessen and van den Ende 2006) where the creation of the success factors is proposed. It was found that there is some similarity between the success factors and the order winners and the order qualifiers of a business.

### **BUSINESS PROCESSES**

*Workflow Modelling* (Sharp and McDermott 2001) is an important reference in the design business processes. Workflow is defined in this sense as “the flow of information and control in a business process” (page 139) . It raises questions related to mission, strategy and goals, core competences and process enablers, and defines the syntax of business process modelling.

### **ENTERPRISE ARCHITECTURE**

From Vaz Velho (Vaz Velho 2004), Firm Architecture Design is a comprehensive study starting from the evolution of IT and centred on the architectural model of organizations. With an initiation phase, as the Project Management Book of Knowledge (PMBOK) (Project Management 2008) also has, the firm architecture includes the Strategic-operational Summary which introduces the concept of the Changing Factors – the documented moves inside the organization that will lead the organization to an upper stage of efficiency. Management Principles, Governance and Business Model, they all belong to the architecture process. The focus or the main perspective is on IS, systems, data and information flow.

### **ARIS**

ARIS is the acronym for ARchitecture of Information Systems, a Business Process Model tool developed in the beginning 1980’s by AW Scheer, the basis of the known market leader

ERP's, such as SAP. ARIS has been developed ever since, into many different directions and areas of management always considering the IS and the IT on the base of managerial business moves. Many articles and books can be found on ARIS and one paper was analysed that suggested proximity to project-based firms. It is not clear that an information system – though relevant and important - is the main pillar for the business model to be developed under this dissertation. This question requires an answer that will be given in the proposal part of dissertation. (Scheer and Nüttgens 2000) presents two fundamental ways for the reengineering of information systems, the “formal driven” and the “content driven” that respectively develop technical and organizational running systems. By using reference models, ARIS proposes a combination of the two in a new way – the “event driven”. It also demonstrates that any company aiming to achieve a comprehensive business process management requires an organizational as well as an IT perspective. ARIS, is built in four levels: (1) Process Engineering, (2) Process Planning and Control, (3) Workflow Control and (4) Application System.

#### **BUSINESS MODEL CANVAS**

Osterwalder and Pigneur in *Business Model Generation* 2010 present a Business Model Canvas that can be a helpful and friendly tool to develop a Business Model Architecture for the Management of Project-based Firms. The same authors first published other articles under

**Table 1 Business Model Canvas Nine Building Blocks**

<b>Value Proposition</b>	The offer to customer and what distinguishes and enhances it from other offers.
<b>Customer segment</b>	The group or groups of people that are potential customers
<b>Customer Channel</b>	The means used to reach customer segment(s)
<b>Customer Relationships</b>	The type of link and assistance created with customers
<b>Key resources</b>	What infrastructure is available to assure business runs
<b>Key partners</b>	Those partners that are part of the business. It's impossible without them or its far better with them
<b>Key activities</b>	The activities that have to be done to satisfy customers and deliver value proposition
<b>Cost Structure</b>	The fixed cost structure for business to run
<b>Revenue Streams</b>	How cash flows from customers come to business

the same topic. In 2003, they draw the four key elements for a business model (Osterwalder and Pigneur 2003) as follows:

1. Product Innovator: value proposition
2. Infrastructure Management: Partnerships, Value configuration

3. Customer Relationship; Relationship Mechanism, Customer Segment (criteria)

4. Financial Aspects: Revenue Pricing; Costs; Profit

The Osterwalder PhD Theses, supervised by Professor Pigneur, (Osterwalder 2004) presents a business model ontology. It develops the four key elements for business models and converts them in the nine building blocks for business model. It is a very comprehensive work under the scope of information systems, more focused on products than on services.

(Giesen et al. 2007, 2) developed the same idea based on the four key elements as follows:

“1 What value is delivered to customers: customer segments, the value proposition, the specific “job to be done,” what is sold and how it is sold.

2 How the value is delivered: critical internal resources and processes as well as external partnerships.

3 How revenue is generated: the pricing model and forms of monetization.

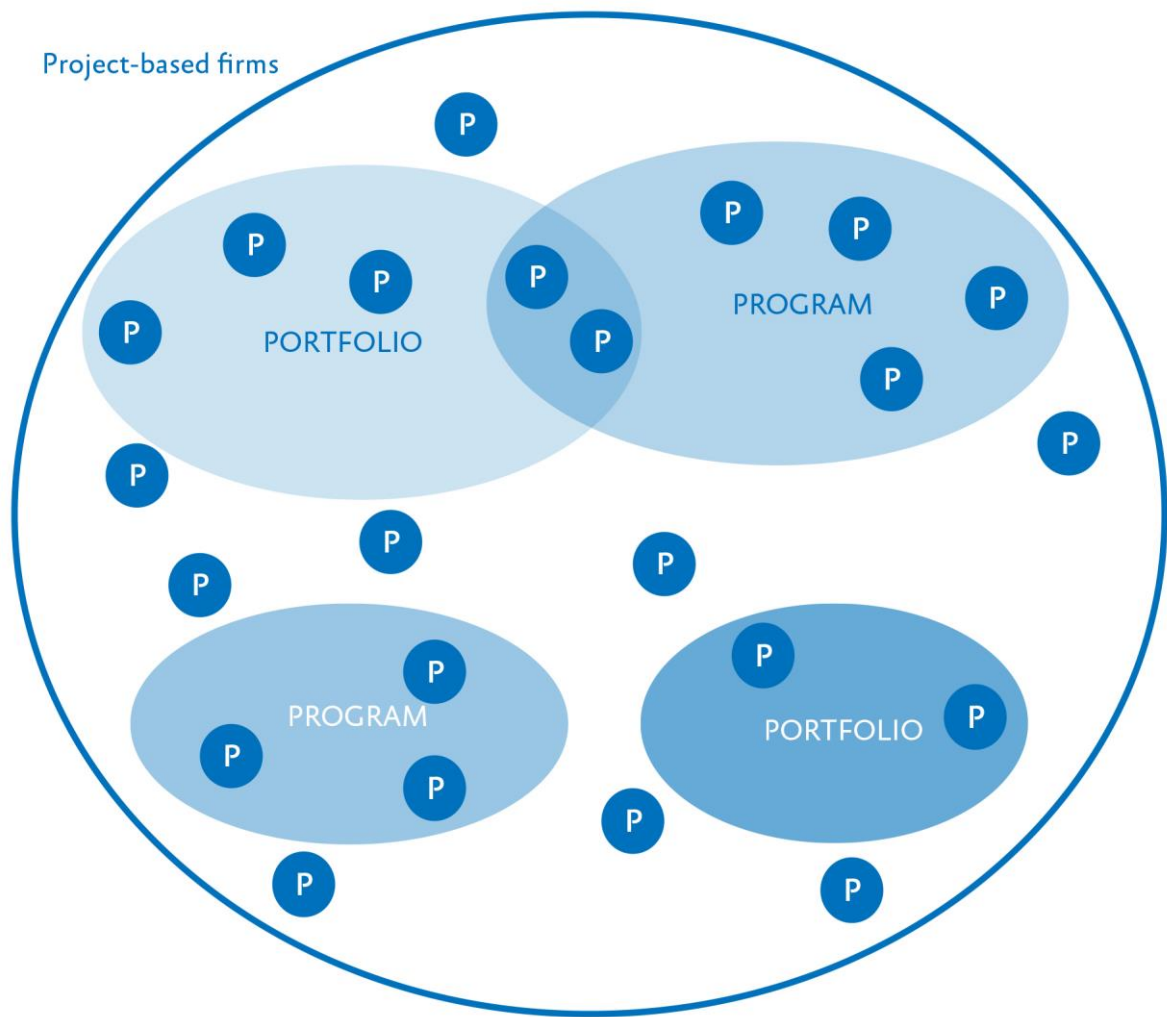
4 How the company positions itself in the industry: the company’s role and relationships across the value chain.”

The nine building blocks are further developed in a broader context, with the participation of a large group of Business Model “stakeholders” in *Business Model Generation* (Osterwalder and Pigneur 2010). The Business Model Canvas (BMC) is presented: a graphical representation for business models composed of the nine building blocks as indicated in Table 1.

## 2.2 Project Management

Project Management is a major topic in this dissertation. It is usually out of the scope of Management and Service Engineering. Major references have been considered as well as standards for project management. Project Management is a very wide area that may be approached through perspectives dealing with different contexts: economical, engineering, social, business management, educational and others. The entrepreneurial project owner’s perspective has been privileged; a project is an undertaking with a beginning and an end and of a finite (usually short) time duration.

Given the author’s professional background, the temptation was at first to look the construction sector as the specific context for project management literature review. A major reference in Project Management is the *Guide to the Project Management Body of Knowledge*, PMBOK, (Project Management 2008) from the Project Management Institute - USA. It was found to be an important instrument for project management from the entrepreneurial owner’s perspective and relevant information can be collected from this Guide. The following citations and quotations from this Guide illustrate its importance. “A project is a temporary endeavour to create a unique, product, service or results” (Project Management 2008, 5), an adequately broad definition within the scope of this dissertation. According to the Guide Project Management is “... the application of knowledge, skills, tools and techniques to project activities to meet the project requirements” (Project Management 2008, 6) . Project management is then defined as a set of processes organized into five groups: Initiating, Planning, Executing, Monitoring and Controlling, and Closing. Projects are usually parts or components of a business, and as a business they are part of a strategy or of a strategic plan meant to achieve goals and objectives.



Source: Author

P = Project

**Figure 1 Project Management Organization Within a Project-based Firm**

Projects are not isolated within the same project-based firm. Project Management, on top of the management of each individual project, may be necessary to ensure links, allowing activities, resources, tools and know how to be shared among different projects. Projects can be included in a specific Program when they have the same or similar outputs or if they have the same structure. On the other hand, if different projects have the same client, use the same technology or the same resources, they can be grouped in Portfolios. In Figure 1 are indicated the organizational context of projects within a Project-based firm. Within a firm, projects involve different processes that are performed by the firm or by other firms, upstream or downstream the value chain. These processes are repetitive and follow procedures that are independent of the project and are replicated in different projects, pursuing efficiency.



Source: Author

**Figure 2 Project Team Environment**

Projects are developed by a Project Team which is usually headed by a Project Manager. Projects do not exist isolated. They deal with other projects, they involve other firms, they relate to people, supporters, and customers. In general terms they relate with several stakeholders, and that has a consequence on the Project team composition, as shown in Figure 2. Another important aspect related with business models, which is also referred in PMBOK, is the project life cycle concept. A project has duration – a life - and as everything in life, in products or in services, it can be described as following a cycle. “The life cycle provides the basic framework for managing the project, regardless of the specific work involved” (Project Management 2008, 15). Other important concepts can be found in the *PMBOK* that relate with this dissertation are the project management knowledge areas: Integration; scope; time; cost; quality; human resources; communication; risk and procurement.

Another important reference in project management is the *Integrated Project Delivery: A Guide* (Architects 2007) from the American Institute of Architects (National and California Council). The AIA perspective is that the main project management stakeholders are the Owners, the Constructors and the Designers with value propositions for their work. Since this dissertation will look at the project management from the owners point of view, just one paper, the IPD Framework (Ashcraft 2012), will be referral, and not the guide itself. The IPD Framework establishes the type of relationships and how to drive them in order to achieve the project goals. It also links with ways of measuring the degree of achievement of those goals. The IPD Framework is most useful for both project participants and project stakeholders and it is divided into Macro Framework that comprehends the contract terms and the business structure and the Micro Framework that defines the operation level activities of the project. The Macro Framework is supported by five pillars: (1) to have an involvement of the stakeholders the earliest possible in the project, (2) a rewarding scheme for goals accomplishment, (3) good communication among stakeholders that allows among other things joint project control, (4) a low degree of liability of stakeholders to enhance creativity and the use of new tools and techniques and (5) the joint development and validation of project targets in a mission statement format. The Micro Framework is composed of three areas. The Work Design includes the lean principles and techniques, the Team Design handles leadership and organization selection and the Information Design describes the communication flow and infrastructure, the Building Information Modelling (BIM) and the financial modelling. The present dissertation will follow principles mainly related with the macro framework.



(Storvang and Clarke 2014) addresses different methodologies for stakeholders involvement in project design, how to choose the right stakeholders and how to extract the best information from them. This is a very important factor considering the increasing relevance of stakeholders in early stages of project design. It also proposes the creation of a socio-technical space for temporary creation, coordination and management of knowledge flows and ideas where all stakeholders interact in equal terms.

Another interesting reference is *Reinventing Project Management* (Dvir and Shenhar 2007), where the idea of a project as a temporary act that uses restricted resources is once again stressed, under the general idea that project problems are mainly managerial and not technical. Metrics are important to assess and drive a project: project efficiency, impact on the customer, impact on the project team, business results and project benchmarking (technologies, markets, and capabilities). These are all related issues to be taken into consideration when building a business model for project management.

### 2.3 New Service Design

Literature review concerning New Service Design, starts with the presentation of a few definitions and concepts. (Edvarsson 2000), a main reference in new service development, defines Service as being intangible, answering to customer heterogeneity, using customers as co-producers and impossible to stock. This view encompasses the traditional definitions of service, including the important factor of co-creating. Service design “is a form of architecture that involves processes ...”(Edvarsson 2000, 11) and “...an iterative process that passes through several stages (1) inspiration, (2) ideation, (3) reflection through prototyping, testing and (4) implementation” (Patrício et al. 2013, 7). A service is also seen as “a value chain of creating activities or events which form a process” (Edvarsson 2000, 32). New service development is the complete process: from the idea to the launching of a new service.

It is also interesting to think about services as being developed and designed at different levels. According to (Patrício, Fisk, and Constantine 2011), there are three levels on a new service design. The overall level that defines the environment of services that integrate and are close to the service to be designed is called the Customer Value Constellation level. The intermediate level, where the different steps or processes that constitute the new service are presented through a Service System Architecture table organizing both actors and processes and where the service flow can be represented assuming the table the form of a Service System Navigation. And the third level, the Service Experience Blueprint where each customer service encounter is described in more detail.

The perspective of innovation is not neglected by these authors “Service innovation is the creation of new and/or improved service offerings, service processes and service business models (...) we focus on creating new service offerings that enable customers to co-create value. A new service is defined as ‘an offering not previously available to customers that results from the addition of offerings, radical changes in the service delivery process, or incremental improvements to existing service’ (Patrício et al. 2013; Johnson et al. 2000; Ostrom et al. 2010). It has to be also considered the Business to Customer (B2C) type of business even if the dissertation topic is more likely a Business to Business (B2B) service. The project-based firm customers are business projects or, if that is not the case, projects that are handled as businesses. It is not the final beneficiary that is the project-based customer. The

(Patrício et al. 2013) paper presents the service design process under an interdisciplinary view. The bridge model adapted to service design that starts from (1) customer experience collected data that sometimes is quite diverse and long, then (2) modelling customer experience data for an easier understanding of new service team designers (or project team members), then based on that model (3) design the new service solution and finally (4) prototypes and implementation of the service solution. This paper also stresses the multilevel method mentioned above from the same author. The core lesson from these papers is that customer experience is a source of inspiration as well as it is a co-creation factor for new service. For new projects, customer experience is relevant as well as stakeholders experience. The bridge model is further developed by (Dubberly and Evenson 2008) steps (1) and (2) being the analyses phase of the model and steps (3) and (4) the synthesis phase of the model.

(*Service science, management and engineering Education for the 21st Century* 2008) may be an interesting book to explore. The author had access to a very short abstract of the book promoted by IBM. The content links universities to private companies and knowledge to businesses, which is relevant to knowledge transfer and knowledge repository.

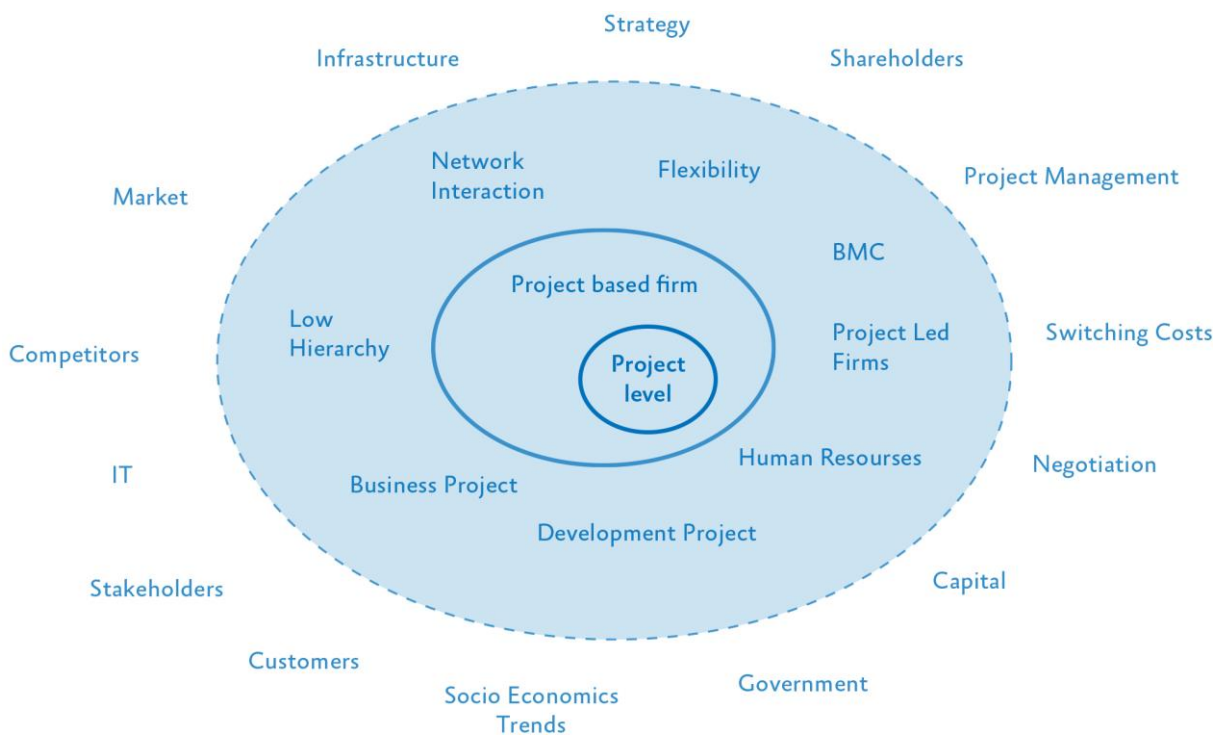
### 3 The Project Problem Discussion. The Research Questions

#### 3.1 The Problem

##### SERVICE PROJECTS AND PROJECT-BASED FIRMS

The Business model architecture for the management of project-based firms. What is meant by that? What a project base firm is what distinguishes it from other firms what is its environment (see Figure 3) and why is it interesting to focus on project-based firms?

Many types of projects and studies are done by the service sector. Many public and private companies, while pursuing their goals, spend resources in developing strategies, operations and processes that are supported by projects. Different kinds of projects can be considered (1)



Source: Author

**Figure 3 Project-based Firms - Business Model Constellation**

more theoretical studies that define strategies to be pursued by organizations such as company strategies, political strategies, regional, national or local development strategies, or industrial national or sectorial strategies. In areas like energy, environment, cultural, information technologies, every goal requires a strategy. (2) At a more operational level, other types of projects can be considered. Many examples can be given; a project of a bridge, a water supply network, transportation and distribution of perishable goods, a business plan. In the industry sector one may also consider many different kinds of projects, on the traditional sectors as well as in the novel ones – for instance those related to environment issues and economic and financial studies associated to development projects as well as the information technology infrastructure required to develop and support them. Finally (3)

detailed projects, some as detailed as processes, can also be subject to design. These three levels (the strategic, the operational and the tactical), encompass projects that have to be developed by organizations, serving many sectors of the society.

Many of these projects creating value and are executed by so-called project-based companies – or companies that maybe without knowing it share the project-based service market. These project-based firms exist to develop projects ordered by customers. This is their offering, what they sell. Two main groups of projects can be encountered: business projects and development projects – the latter being those that when concluded, generate a product or a service, a new player to be established in the economy. In most cases, firms that undertake studies, projects and project management are built as service suppliers, whose goals are offering their specific capabilities. For the purpose of this dissertation and according to what is referred by the literature, these firms will be designated as project-based firms or project-based organizations. Project-based firms develop plans and drawings, calculi, diagrams and schemes, generate information and data to be used by others. Those firm's business goal is to develop projects for customers to implement, and they can do it (and they usually do it) for more than one customer at the same time and they do not extinguish themselves after a project is concluded. To accomplish their task, project-based firms need several types of skills many of them outside of their specific “know how”. They obtain those extra skills from other firms and so, these firms increasingly work with other firms – often other project-based firms - to develop a unique global project that might cover many different areas of knowledge.

Projects can naturally be promoted by public or private organizations or firms. The way these two types of organizations deal with efficiency and effectiveness is different. With this in mind two separate problem analysis are done for each sector portraying the “as is” differences of the environments or context that the projects have to cope with. The purpose of this dissertation is, nevertheless to have a unique answer and to build an unique business model for the project-based firm and an unique business process for projects.

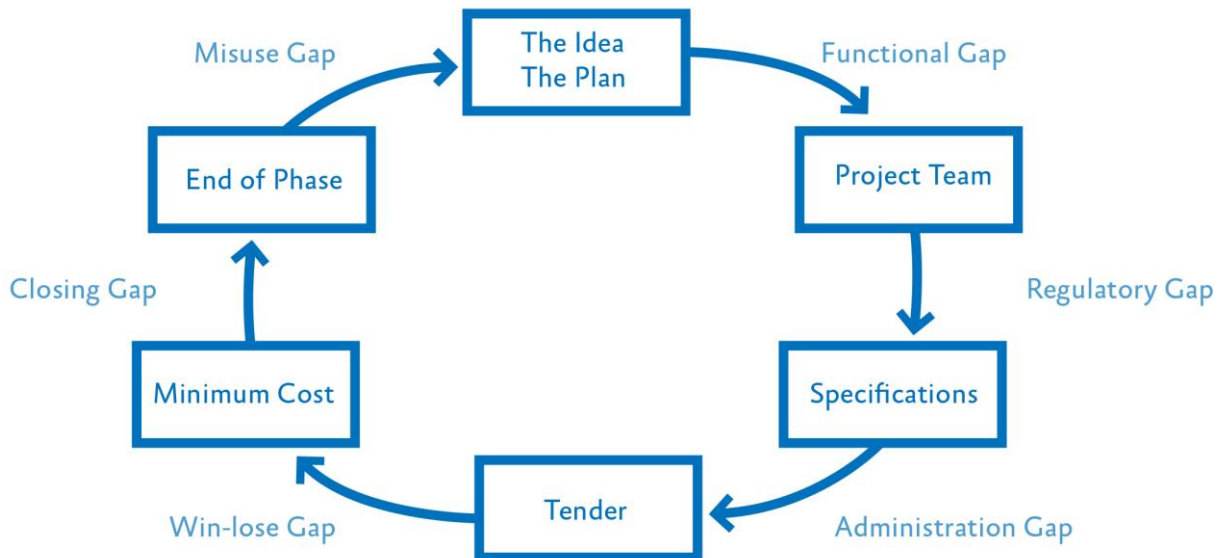
#### **EFFICIENCY AND EFFECTIVENESS IN PUBLIC SECTOR PROJECTS**

The efficiency and effectiveness level of project design process differs a lot from country to country and in many countries from domain to domain. Portugal is definitely a case where in many domains the lack of efficiency is notorious, in particular in the public sector. Efficiency gaps in different steps of project development can be found that show where losses of resources effectively take place.

It has been pointed out that different groups of stakeholders may exist, and that project management is required at many levels. Two main topics can be referred in this respect. A complete integration of the different parts that compose a project is rarely achieved and, particularly in the public sector, a considerable waste of resources can be found and observed in the deployment. This may happen either because projects are eventually not executed or their conclusions, findings or recommendations are not applied. Often waste arises because projects are executed in a very inefficient way generally generating extra costs and very often worst results. In short either because projects are not used or because they are not complete and integrated or they are not well deployed, they represent a waste of resources of all kind. This can be observed in many domains.

The public sector competition, or the lack of it, is an issue that may affect project efficiency, because public entities and public administration do not have two different bodies to execute the same task. When a task is to be done, a project or a study, a tender takes place and private

companies bid for it. Since only one public service deals with that specific project, that is why there are no competitors for that public service. The consequence is that no one helps, or forces, public administration to try to have the best possible project. Or, in a different way, to have a project that covers a broader management scope under a holistic vision of the project requirements, taking in account all the stakeholder perspectives. That is, a project not restricted to the sectorial and fragmented perspective of the specific public service or office involved.



Source: Author

**Figure 4 Public Sector Project Efficiency Loss Gaps**

Almost by nature, public sector projects involve different areas which usually belong to different departments of more than one public body or organization. Prior to approval, each project goes through many departments, and all the weight of public decision-making administration is transformed in timetable postponements. The lack of internal competition and of other mechanisms to regulate project activity brings the project to a low standard of efficiency.

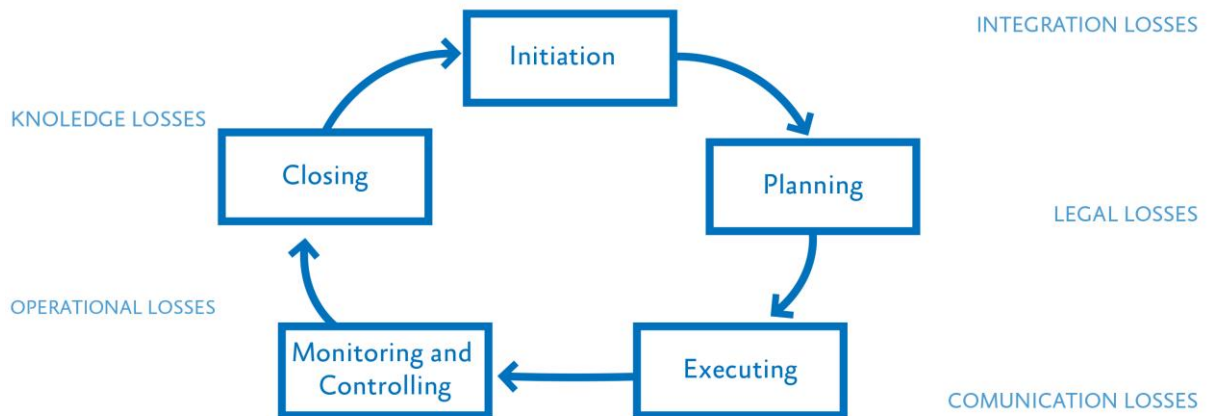
The life cycle of a public project in the public sector shows many potential gaps leading to inefficiencies as the Figure 4 indicates. The Functional Gap represents the potential loss in the project management during the initiation phase, when a functional structure is put in place and an usually small internal team is appointed to develop a project. The issue is who does such a team serve? To whom do they report? Where is the mission statement of the project? The Regulatory Gap takes place when building specifications and requirements. What does the law, the unions, and other regulators allow and do not allow. The legislation is often seen as constraining the scope of the project. There is no mechanism – a global one, as technical regulations do exist in many domains including quality standards - to assure that the project is the best that suits society: population, customers, users, tax payers, owners. The Administrative Gap relates to the network of services that have to give an approval to the project. Very often relationships among services are not fluid and procedures are not simply there, yet a consequence of the Functional Gap? The Win-lose Gap is associated with the tender process where the less cost tender wins. The proposal who presents the lower cost wins

the tender, being the remaining factors “equal”. All the others bidders are lost, as well as whatever good propositions they propose. Where is communication with the stakeholders and suppliers? There is no flexibility, no negotiation phase. The Closing Gap when knowledge emerges when could be shared. The Misuse Gap comes later. After being concluded many projects are kept in drawers and do not serve any purpose. They are not experimented, analysed or transformed, often not even partially. The scope of the project and the mission statement were not properly defined. There is a huge loss of resources when this situation occurs: financial and human resources as well.

**EFFICIENCY AND EFFECTIVENESS OF PRIVATE SECTOR PROJECTS**

The reality described above for the public sector, also occurs in the private sector but in a different way. A service project of a private company designed to win a market share by presenting a new value proposition to that market, is confronted by other competitors that are struggling to offer a similar solution for the same customer segment. So, when the “to be” business model is to come out, careful positioning and market segmentation has to take in consideration other players.

Failure in the private sector is somehow more serious than in the public sector, because every euro has to be justified and there is always a shareholder behind it. Other stakeholders have requirements and expectations that have to be fulfilled and the financial legal framework is relevant, as well unions and other administration or regulatory authorities. These context forces may restrain project movements and force adverse developments in project deployment. They may include labour policies, accounting rules, or protection zones that affect the project in the negative and in this case also in the positive sense. Some authorities’ legislation can be adapted in order to obtain a better project. Services, namely consultancy, were already a component of projects but *servitization* brought other services into projects. The after sale component of a project or project maintenance is considered from the beginning and they may change the overall environment of the project: investment costs are relevant, in some cases so are the operational costs as well. If in public administration responsibilities are blurred most of the times that is certainly not the case in private sector. In Figure 5, based on the PMBOK project phases, are indicated the efficiency losses usually found.



Source: Author

**Figure 5 Private Sector Project Efficiency Losses**

The Figure 5 represents the project cycle according to *PMBOK*, and the areas of losses of efficiency during that cycle. The Integration Loss derives from the short range of knowledge areas involved in the project management and from the project team group constitution, since both affect and bias the whole project development. Late involvement of stakeholders is, according to (Ashcraft 2012), another weakness of some projects. The Legal Losses derive from not giving the right weight to the rules, laws and regulations that create the environment where the project is to be developed: financial, energy costs, accounting or from the project activity sector. The Communication Losses occur when the information flow is unset or unfit, causing losses of data among the project participants. It covers as well the phase of negotiation. Often it is also a loss of partnership skills. Communication is a long supporting activity of the project. Operational Losses derive from lack of operational skills and it sometimes relates with communication and human resources. The Knowledge Losses have to do with the knowledge accumulation during project execution, how to store it in a knowledge repository for later use by the project-based firms community and the technical and scientific society in general. Either this knowledge is to be shared (open-innovation) or it is a key part of the value proposition that should be kept private?

It's clear that the relevant perspective in this dissertation is the one of project's owner, the promoter, the entrepreneur. The trigger decision (go - no go) is logged there. However to materialize the project, it will require project management. Many promoters have the necessary skills needed for project management and to make decisions that no one else besides owners and promoters or shareholders are supposed to do it. That was the case of the promoters interviewed for the purpose of this dissertation as it can be seen in the next chapter. But knowledge areas are diverse and require skills that have to be assembled in a team. Data is required to make decisions and that data is obtained, framed and structured from studies, projects and project management. Besides the technical and quality issues, or the economic and financial ones, it can be necessary to evaluate and manage the project risk, time and opportunity, the human resources, the communication among stakeholders, the information flow, etc. Public sector definitely will benefit from the same complete scope of management knowledge.

Maybe what it is not so clear is the project-based firm orientation. It has already been stated that project-based firms are nodes in business-to-business links and that the owners' perspective is the important one for business analysis and he is the one who has the trigger decision-making power. And the owner is the project customer. Linking these factors it can be understood that project-based firm business are mainly customer oriented.

### **3.2 Research Questions**

In a final scenario, for every and all entity that wishes to develop a project according to the state of the art, following innovative business models, a project-based firm is created.

- How can a firm – the project-based firm - assist as a service (AaaS) those entities?
- How to innovate in design and in the deployment of a service that delivers to customers the value proposition that consists in improving their efficiency and effectiveness as they develop their projects?
- Which business model should be built to support that service, that strategy, the management of those project operations?

- Are project-based firms going mobile?



## 4 Data Collection Process

### 4.1 Introduction

In order to enrich the requirements to design a business model architecture for a project-based firm, some real cases were approached by means of interviewing some companies. Interviews were carried out in three companies that present de diversity needed, since they either developed a main project or are project-based companies. The goal of the interviews is to have an insight on the companies perspective concerning relevant topics of the dissertation – how they handle project management, how project and service relates and how they position their business model. No statistical analysis of project-based companies was intended. The global perspective focuses in projects developed by companies that require project teams do develop those projects - the most relevant on the analysis being the owners point of view, which eventually happened with the interviewed firm managers. To help constructing and conducting the interviews it was used the book *Case Method: Business Interviewing* (Hickman and Longman 1994).

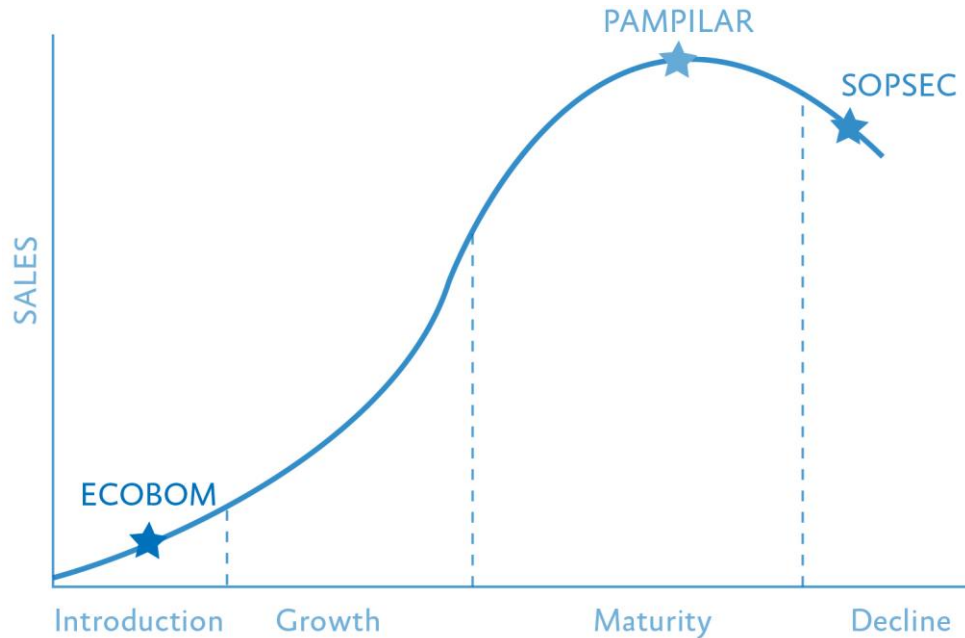
The main purposes of the interviews were:

- To characterise the firm in terms of project management and draft an “as is” model covering project implementation.
- To identify key activities and how they are deployed in processes?
- To identify which are the main players in business?
- To evaluate the relevance of IS as a supporting activity and as vehicle for change.
- To find out how an external assistance in project management can be useful to help firms on managing and developing projects.
- To find out how business innovation occurs which steps were given in that direction and which were the constraints identified.
- To evaluate the awareness of the company regarding the use of business models as tools and theirs relevance for business development.

The interview was organized in three parts. The first part covers the company and its organizational structure, relevant internal and external stakeholders and customer channels. The second part focuses on a specific project, developed by the company that adequately illustrates project process flows and networks. And the third part regards the perspective of the firm developments and what management tools should be used to reduce losses and attain a higher level of efficiency and effectiveness in the project processes. It is also aimed to know how companies face the future, do they need to change their business model and what are they doing or not doing concerning market challenges and the need to innovate and keep the company on the crest of the wave to survive and cope with competition. Finally it was considered very important to identify which constraints affect the firm development path and the ideas of how to possibly overcome them.

The first firm interviewed was a civil engineer project company SOPSEC, the second one a company named ECOBOM that is developing a bottled mineral water company in Mozambique, and the third one is a paper company, PAMPILAR, that is implementing a new production unit in northern region of Portugal.

In Figure 6, each interview was positioned in terms of life cycle. As it will better understood below, through the highlights of each interview, each company is in its own life cycle phase. ECOBOM launched the project less than one year ago in a market where there are only a few players. PAMPILAR is established in a steady activity sector that requires permanent innovation to guarantee a good market positioning. SOPSEC activity is on a traditional sector, where market shrink was notorious in recent years, which lead to a big decrease of business volume.



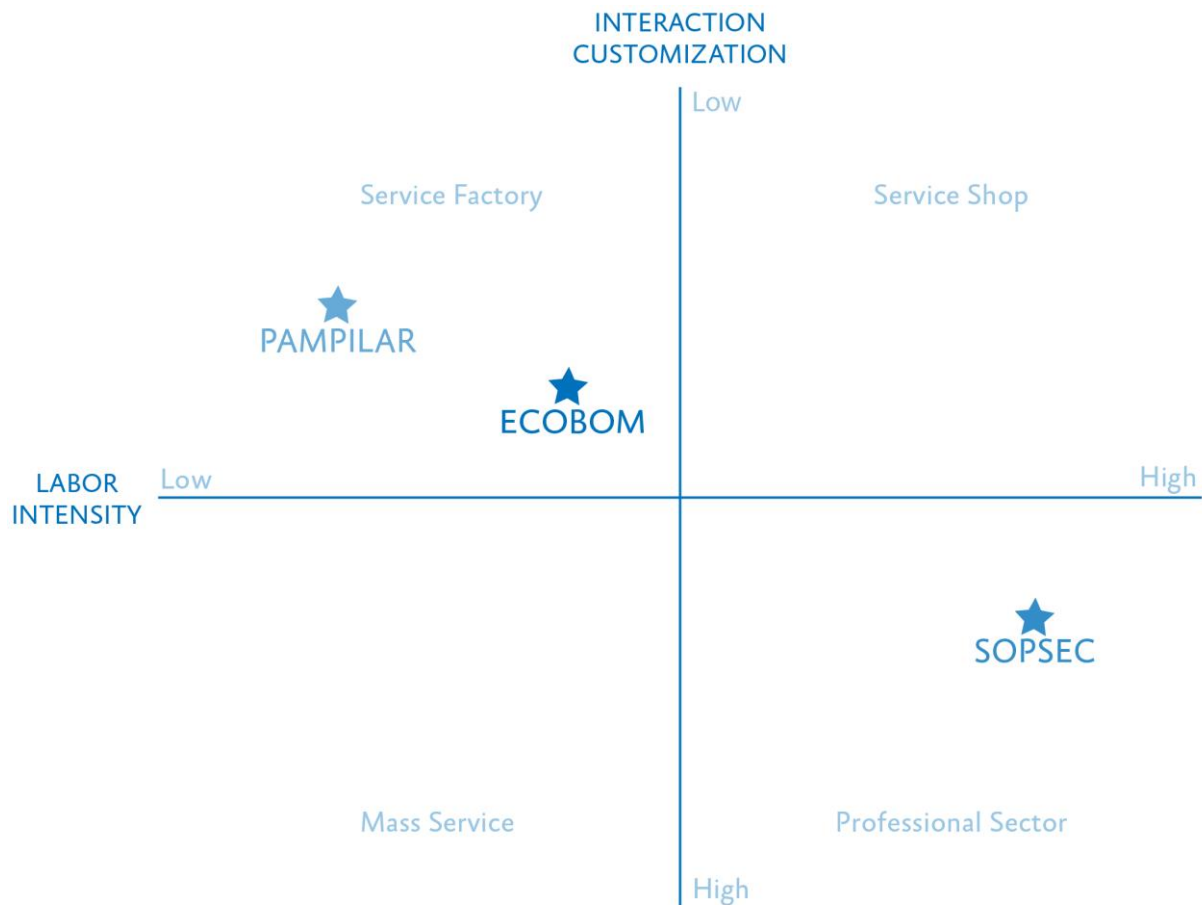
Source: Author (Adapted)

**Figure 6 Companies Position in Life Cycle Stages**

The duration of each interview has been between one and a half and two hours, and the interviewed have authorized the recording of the interview. Such a short period was certainly not long enough to allow a full picture of the companies or projects involved, but most important information was obtained in each case. The selection of three companies of different types was done with the aim of ensuring the coverage of a broader scope of management issues stemming from different business environments. As indicated in Figure 7, the short sample only covers two quadrants of the Service Process Matrix (Schmenner 1986), but only in the private sector. The author's knowledge and experience of the public sector, actually the result of a life-time professional experience, will compensate this weakness of the inspiration phase.

The sample of companies to interview was obtained through the author's personal and professional relationships. One of the companies is associated with the co-supervisor of this dissertation. The conversation and the answers given by the interviewed enriched the dissertation in terms of the "as is" business model and also in the analysis of a project process development.

The guidelines for the interview can be found in appendix A. The interviews took place at the company's offices and were conducted by the author of the dissertation and registered in paper notes as well as recorded using a voice tracer. A second short meeting took place with



Source: Author adapted from (Schemenner, 1986)

**Figure 7 Companies Position in the Service Process Matrix**

the interviewed in order to clarify some interview details and to give the interviewed the opportunity to comment the “as is” business model built based on the interviews.

#### 4.2 SOPSEC interview

The interview was with the director of Innovation and Development department, Eng<sup>a</sup> Susana Matos working in SOPSEC since 14 years ago, and it took place on the 8<sup>th</sup> may 2015 at 14 hours in SOPSEC main office, Vila Nova de Gaia. The highlights of the interview having in mind the object of the present dissertation, are presented below.

##### **The company**

SOPSEC, Sociedade de Prestação de Serviços de Engenharia Civil, S.A. , headquarters in VN Gaia, was founded in 1988 and has over 70 employees. Prior to the 2011 crisis the company was twice as large as it is now, and the annual sales volume has been decreasing since then. A major challenge to be faced is to decide which strategy is this company going to follow and under each business model? There is not a clear answer to it but the information obtained in the interview allows some rationale to be built.

The company belongs to a traditional sector in Portugal and has a traditional functional organogram. Departments are headed by directors that report to the administration. Most employees are in project design production, environment or on construction management and inspection (the core activities of the company). These two departments are subdivided in divisions headed by coordinators. A small number of employees are on human resources and financial departments. Prior to the 2011 crisis each department had its own commercial sector. This situation was changed and a commercial department was created, with a high degree of autonomy, to serve all the other departments. The IT department has only one person. SOPSEC has two main IS applications: GESCOR, for archiving all documentation concerning the core activities and all written information or information flow; and PHC covering financial and accounting areas. Besides those applications, that do not communicate but that are in a network environment, there are some more technical IT tools like CAD©, MSOffice©, etc.. IT is fully in house and outsourcing is required occasionally. Two changing factors were identified but neither of them has yet a date planned for execution: the creation of an intranet and the replacement of the main servers.

No exact data was obtained concerning the cost structure but the large majority is with human resources, 80% or more, and a relatively small part with building maintenance, office materials and IT. Human resource costs are managed according to cost centre methodology. Sales comes 60% from the private sector with a trend to grow, and 40% from the public administration with a trend to diminish.

### **The Project**

SOPSEC constantly and continuously develops projects to their customers. A large distributor was chosen as a reference project customer, because it deals with SOPSEC since many years now and also because their projects are organized according to a portfolio irrespective if they are new buildings or renovation of shops in shopping centres. A large number of issues, which will be dealt with below, are related to projects with this specific customer.

### **Stakeholders**

Concerning the internal stakeholders, mainly production and administration are involved in the core activities. The information systems and the human resources have a minimum role on the top two levels of management – strategic and tactical - and have a small importance at the operational level. External stakeholders are very few that can be defined as key partners. Depending on the project, often the firms involved change in the project teams. A commercial bank is a key partner of SOPSEC.

### **SWOT analysis**

In a broad vision related with a SWOT analysis SOPSEC currently finds more Threats than Opportunities. The former market (internal market in Portugal) was significantly reduced in the last years. As a consequence there has been a reduction in size of the firms, some of them with large layoffs, leading to the creation of many small project firms which are strongly competing with the heavy and older ones. Some clients are still there, but a very strong reduction took place on the building construction sector where the activity is now rather small. Another important factor that affects the market is the unitary price decrease of service costs in construction. The same task has a smaller value, prices and revenues streams are

smaller and narrower with smashed margins. At the same time labour laws are not flexible and place constraints on human resources management moves.

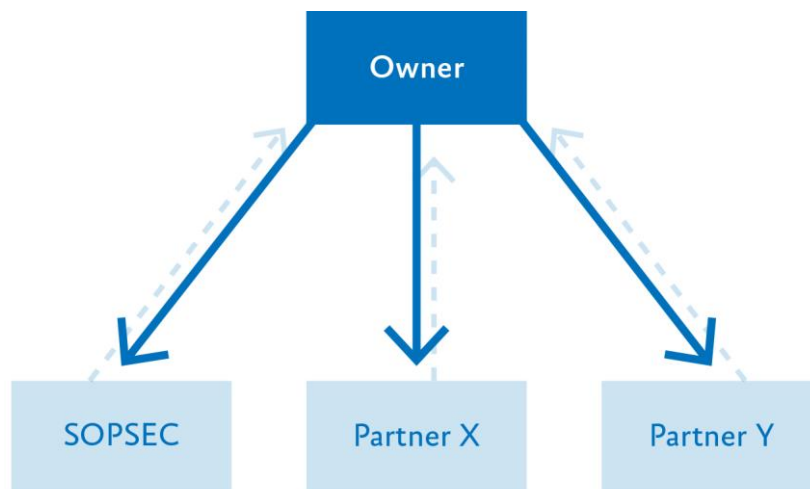
For SOPSEC, emerging markets represent new opportunities for business. Examples are tourism – Hotels – and a growing investment on Industry buildings. Foreign markets are being explored but there is not a strong investment in them. Historical customer channels based on word-of-mouth information tend to be the prevailing model.

SOPSEC Strengths are their knowledge and the people within the organization. Personal contacts are still of great relevance for gathering new projects and the image – SOPSEC brand –is also relevant at the regional and at national level.

As Weaknesses one has to consider the infrastructure and the functional type of the company with less flexibility. A large number of employees –more than half – has been dismissed but the company still kept the some organization type and still follows the same business model. Reduction of revenues also led to the decrease of internal training, even if it is clear that human resources that were trained in the past are now occupying key positions in the company. And it is also recognized – which may seem a paradox – that employees have to increase their efficiency and produce more in every hour they work. Before deploying a final “as is” business model, it is still important to mention how projects are managed and how the relationship with customers is organized.

**Customer Segments, Channels and Relationships**

The main construction customer segment concerned is still the buildings construction area. In terms of management and inspection, there is a wider range of construction activities covered by SOPSEC. But overall there was not a diversification on the customers segments in spite of the big reduction in the market size. Customer’s channels, as stated above, are mainly based on word-of-mouth information. Some new customers are obtained through tenders. It is not through their internet site that SOPSEC reaches their clients and they do not use advertising, marketing campaigns or sales force. Today’s customers are long time important customers, in terms of business volume, such as a large distributor and a tire producer, and the new customers come from Industry and Tourism.



Source: Author

**Figure 8 Top Down Business Links**

Customer projects are handled by SOPSEC in a not uniform way. Some customers with more than one project have their projects organized in portfolio and have one only person within SOPSEC responsible for that portfolio. Others customers under the same conditions have a different counterparts within SOPSEC. It seems like for each case a customized relationship is established. Projects are developed by a project team and the project leader is always from SOPSEC if the project is owned by a SOPSEC customer. In the majority of the cases the project leader is a department director.

When SOPSEC integrates a project with other partners in most cases the relationships with other partners are usually through the owner and no formal links exist among partners as shown in Figure 8.

**Main Findings**

Based on the information collected during the interview and available at the SOPSEC site an “as is” business model was built as represented in Figure 9.



Source: Author adapted from (Osterwalder and Pigneur, 2010)

**Figure 9 SOPSEC “as is” Business Model Canvas**

The steps that were took or are intended to be taken by SOPEC to overcome the shrinking activity that the company undergoes are presented below:

- Besides the layoff of many employees due to the lack of work, the major step that was given internally was forming the commercial sector responsible for proposals for tenders with a large degree of autonomy, extinguishing the department ones. No other relevant actions were taken in terms of the internal structure of the company.
- project managers of the of project design teams are usually the coordinators or directors
- The need of a bigger productivity – linked to the hourly efficiency of each worker – was identified, but no measures were taken besides the pressure to work harder.

- The Information System is not linked to any strategy, and seems not having any significant role in the development of the company; the management of the company's know how is still being done in conventional.
- Projects for building construction is still the core activity in terms of projects and the diversification occurs in the niche market of building facades. Looking for new markets abroad is also a focus of the administration, but foreign market still represents a very small share of the revenue streams.

### **4.3 ECOBOM Interview**

The interview took place in Capitólio building in Porto on the 15<sup>th</sup> may 2015 and Mr Joaquim Branco – economist – from the Administration Board of both ECOBOM and Mozapart, was the interviewed. The interview took 1 hour and 30 minutes.

#### **THE COMPANY**

Mozapart SGPS is a private company in Portugal whose main goal is to promote investments in Mozambique. The first investment in Mozambique was an extraction and bottling line for mineral water. ECOBOM was created for that purpose.

#### **THE PROJECT**

The project for bottled mineral water in Mozambique was born from a group of investors who required capital and addressed Business Angels in Porto to associate with them. Business Angels Porto together with another business angels association joined together and created MOZAPART SGPS. Mozapart eventually bought the original investors share and is now the only owner of the project. The first studies and first steps were taken in 2010 by the first group of investors and the Business Angels took over in 2012. The production of bottled water began in November 2014. For the purpose of this project, ECOBOM was created in 2012 in Mozambique.

What was the motivation for the water business in Mozambique? Water is certainly a strategic resource in the future and the quality water market is growing so the opportunity was found. In Mozambique there is a big need for drinking water and with the GDP growing 8% per year, a new class of people is growing with purchasing power. The market is currently controlled by two Mozambican brands. A brand that covers 70% of the market – with poor water quality – and another brand that covers 20% of the market but that has no possibility to grow. So it was considered that a third brand would have room enough to start operation. Besides that, imported mineral water is consumed by expatriates, in great number, that do not trust Mozambican water, at a price three times higher than that of the Mozambican brands.

A business plan that included several studies, including schedule, cost, market, consumers and competitors, procurement, quality and scope was developed. Integration of these aspects also took place but no management of Human Resources, Communication or Risk was done. And so the project was launched.

The water resource to be exploited is 60 km north of Maputo where the water plant was built: extraction and bottling, with the plastic bottles produced in-line in the plant. The warehouse and commercial services are located in Maputo, from where irradiates the large majority of the water distribution channels. In total, there are about 38 people working in both places. The structure of the company is functional with a General director that supervises four

departments: Administrative and Human resources; Accounting; Comercial and the Water Plant. The water plant director has different departments, like maintenance, IT, electricity or quality. The Cost Structure was easily identified by the interviewed: Human Resources account for 25% of costs, 40% is taken by service suppliers - distribution transportation to a large measure, electricity, the rent of the plant site (that could not be bought due to local regulations), as well as all charges related to farmers displacement from the water plant area to new sites, the ERP leasing, the outsourced salaries processing and accounting, etc.). Circa 35% goes for raw material (Bottling pets) and other. As far as information technology is concerned and besides the standard office products ECOBOM have leased an ERP for financial management that they operate internally from overseas, and they outsource salaries processing and accounting to a local company.

New projects under ECOBOM are to be considered in short term, such as, new customer segments for water distribution at a higher cost, as well as, soft drinks production. However, as the water distribution started in November 2014 ECOBOM is still waiting for some significant results for the water business before they move to a new investment.

#### **STAKEHOLDERS**

Using a functional structure and functional internal processes, business management is carried out by Management CO's as follows: The CEO in Mozambique that is assessed by a CFO, a Chief Comercial Officer, a Chief Sales Officer and Chief Plant Officer. Each is responsible for his own area with no interchange of information between different departments for the time being at least, during this starting phase of the project.

As far as external stakeholders are concerned, ECOBOM is a quite closed company and entities outside the company do not contribute for the management of the company or of for the project, maybe with the exception of the financial institutions involved in the business.

#### **SWOT ANALYSIS**

Threats: quality assurance of water is a big concern in the African countries in particular. It should be noted that water springs out of the source in summer at 28 degrees °C. The political instability is also a business threat, as the political situation is still not clear and stable. Social instability brings also safety concerns. The economic and financial situation, as far as the capital is concern, is naturally a most relevant aspect. The investment was done but as the political situation is not stable it may happen that it will not be possible to transfer profits or other income out of Mozambique. The shortage of skilled human resources is also a a constraint to be faced. The best skilled human resources working there are from Portugal. Finally the equipment and equipment maintenance with spare parts difficult to obtain may bring problems. Electric energy supply is also a big problem with great changes of tension and with power breakdowns which imply the restarting of the equipment's and production ruptures.

The Opportunity comes from the fact that the licence for water extraction covers a very large area and no other mineral water licence can be obtained by other company in a circle of 200 to 300 kilometres and in association with the fact that transportation is very expensive, there is a wide "protected" region that makes life difficult for new entrants.

As a Strength it can be referred the fact that ECOBOM uses as much as possible local entities to provide services or partnerships. That is the case with banking services and loans, the accounting firm and the human resources that are mostly local. As a Weakness one may refer



the poor quality of the equipment purchased and the constant need for training of the employees.

#### **CUSTOMER SEGMENTS, CHANNELS AND RELATIONSHIPS**

A Marketing plan was developed and implemented for ECOBOM. Positioning through pricing was the main issue in marketing. The price should be higher than the cheapest poor quality water (the one that accounts for the 70% of the market). To attack this competitor with a lower price would be a suicide, since they would smash ECOBOM. The price of water of the company that has 20% of the market is also higher; but they have a limited production capacity and they sell everything they produce. So a price in between the two was chosen. ECOBOM informed their customers that retailers were not supposed to sell cheaper than the cheap water, even if their margins would allow them to do so. Considering that it is a new product, branding was also an important marketing issue. The name of the water was studied: MATISANA. Mati means water in the local language and sana standing for healthy. Publicity campaigns also took place in television, social networks, and outdoors. The local and regional factors and the Mozambican look were fundamental in the marketing plan.

Customers in retail were obtained through sales forces. Sale forces are very important to get new clients as the Mass Market segment is the one chosen by ECOBOM. Mass markets are reached through supermarkets and tourism market (hotels and restaurants). They are now entering the informal markets – street markets – as they exist in very large number and account for an important share of the retail market.

Formal communication among employees inside the company and to outside customers or suppliers is made by internet through emails, besides paper supported communication. No templates or other regular procedures are used to help standardizing information flow.

In terms of human resources, the state of Mozambique and the unions have established long and detailed regulations that were transposed to the company regulations. Human Resources ECOBOM policy rewards employees from Sale forces, Plant CO and Comercial CO.

Rewarding policy is to be extended to other sectors when time comes.

#### **MAIN FINDINGS**

In Figure 10 an “as is” Business Model was built based on the information collected during the interview.



Source: Author adapted from (Osterwalder and Pigneur, 2010)

**Figure 10 ECOBOM “as is” Business Model Canvas**

- Once the production line is established no innovation opportunities are foreseen by the management, since in technological terms both the product and the production processes are simple.
- No changing factors are foreseen by the management concerning Information Technologies or in the Commercial sector.
- Marketing was the important factor: the pricing determined that water price should be above the price of the cheapest water and positioned the product; the branding under a Mozambican “flag”; the diverse forms of advertising.
- The business plan did not include risk management. It has already been detected that electricity supply threatens regular production and equipment reliability is lower than expected (the plant equipment is made in China and it is creating problems, so breakdown and replacement had already started). These risk analysis aspects were not studied and were not included in the business plan.
- The negotiation process, useful in many cases for technical and equipment innovation purposes, did not occur with ECOBOM since the acquisition of the equipment was done prior to project development.
- Management does not see a need for studying a new business model.
- For the time being no special role is considered for external stakeholders and even for internal stakeholders, but only for investors.

#### 4.4 PAMPILAR Interview

The interview took place in PAMPILAR Administration offices in Porto, Rua Dr Alberto Macedo, 128 on the 20<sup>th</sup> may 2015 at 14.30 and it took one hour and forty minutes. The interview was with Mr Paulo Marques president of the board.

##### THE COMPANY

PAMPILAR was founded in 1992 for commercialising home paper products. It started their industrial activity in 2000, producing paper napkins in the Serzedo plant, Vila Nova de Gaia. Production capacity was increased in 2005 and in 2006. The factory was fully renovated in 2009, with three new production lines. In that same year, a new factory was built through a partnership with an external company, in Vila Meã – Viseu - starting the production of kitchen and toilet paper rolls.

PAMPILAR has a functional structure organization, with an administration board and five main departments: Production, that also includes Quality Control; Logistics; Comercial; Administrative and Financial, which includes Human Resources; Quality Assurance that also deals with innovation. On total, there are 37 company employees plus around 20 outsourced operational workers on the production lines. They sell an average of 20 trucks per day of both paper rolls and folded paper, to the distribution sector.

The value proposition of PAMPILAR is to a great extent related with the quality of the paper tissues and the innovation in colours and patterns. PAMPILAR always tries to bring new products to the market and always has to copy new products that show up in the market. Another selling characteristic they believe distinguishes them from competition, and it is also an added value, is that they satisfy orders at most with a 48 hours lead-time in 98% of the cases. So, though their main customer segment is the mass market – and when PAMPILAR introduces a new product it introduces both with their brand name simultaneously with the distributors “white brand” name - products are directed to the upper level of that mass market. Among the 10 best sold products in the supermarkets (in units) are the toilet paper and the paper napkins.

The market has been, so far, the Portuguese market. All PAMPILAR products are of low density cost, that is they occupy a large volume for a low price, and therefore transportation costs are an important factor to consider: transportation is not worth over 400 km. The Portuguese market is a mature market: it is not growing and prices have a tendency to decrease, that is why the introduction of new products is so important. Despite that, since one year now Pampilar is studying a way of exporting in small quantities the range of more expensive products to several countries in Europe, North and Sub-Saharan Africa, and North America.

The production cost structure was defined approximately as follows: 60% of the cost is allocated to the purchase of raw materials – tissue paper; 20% of the cost is with service suppliers, electricity being an important one; 5-6% to human resources and the remaining costs are affected to maintenance of equipment and building's. PAMPILAR has an high productivity index per capita.

The information system deals in some way, though not deeply, with production management, but completely with salaries and invoicing. Accounting is outsourced. IT does not play a key activity in the project and it is not a transforming factor, but a supporting one.

**THE PROJECT**

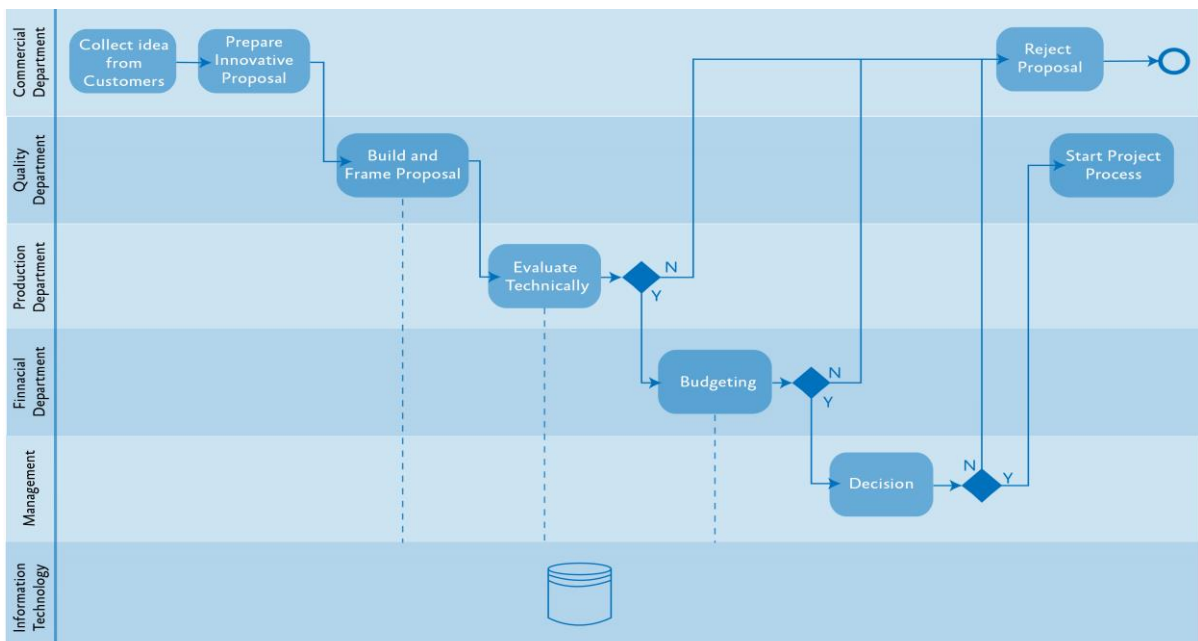
The new project of PAMPILAR is the installation of a new production line in Serzedo, in new premises. State-of-the-art technologies will be used for manufacturing napkins. A new warehouse in Serzedo is about to be finished. The new line should be running in 2015 with the project started in 2013 i.e. the project took a little less than two years.

Project Management covered the main knowledge areas defined by literature. Skilled workers and professionals were necessary for the new production line namely engineers with specific training. Risk analysis took place, as well schedule, cost analysis, commercial (marketing) studies, communication links as well as quality assurance aspects. The project had a Project Team with a Project Manager composed of in house people. There were several teams for the different studies requiring integrated management, and some of those specialized studies were outsourced.

A business model is relevant and, according to the interviewed’ s opinion, every time one gets to a stage time comes to start thinking on the next one. So the business model has to be opened to constant renovation. This project can be included in the new exporting strategy, selling to many different countries quality and innovative products in small quantities addressing niche markets.

**STAKEHOLDERS**

Inside the company each department works on its own. However, innovation for new products, always present in the company, is partially responsible for an innovation process within and across the company departments. It starts in the commercial department where new ideas are gathered, moves to the quality department which is responsible for innovation, production analyses and verifies the solution, financial makes the first economical calculations and the management is responsible for the final decision on whether to move on to a new project or not. In the innovation process all departments within the company act as stakeholders. The innovation workflow is depicted in the Figure 11.



Source: Author

**Figure 11 PAMPILAR - Product Innovation Workflow**

One main concern of PAMPILAR is to reduce stocks of raw material and stock costs. The supply of raw material is ordered to meet solely the amount of total orders of finished products to be delivered in the next few days. This is because the stock of raw materials is costly and has a great impact on cash flow, so the lower stock the lower the negative impact.

#### External stakeholders

During the project implementation there is a crucial external stakeholder which is the equipment supplier. There is a first phase of the project– the negotiation phase – during which PAMPILAR has to choose the appropriate equipment for their needs. Suppliers, equipment manufacturers, customize their solutions to customer needs, transforming knowledge how in unique products/systems. The process of choosing the supplier that will get the order is a creative process at different levels. Multiple criteria are to be met by this new production line. Costs should be minimized, energy consumption reduced, production capacity increased, less human resources involved (though they have higher skills) in the production process, with an environmentally cleaner production output. so the suppliers are challenged by the buyer to present a better offer. Servitization is also a topic over the negotiation table. The negotiation phase is very innovative this being a very important aspect of the project development. After this phase, a second one starts after one supplier was chosen and a contract is signed according to a set of specifications that include goals, schedules, costs and innovation procedures. During this phase, the interaction between project owner and supplier is better balanced, because the selected supplier becomes a privileged partner. The equipment to be installed may impose requirements to the owners and constraints to the site where they will be installed. Later on, after the equipment is commissioned, the need for maintenance keeps the supplier as an important stakeholder of the production process.

#### **SWOT ANALYSIS**

Various Threats can be identified. All products have life cycles, so there is an end to every product. It is not possible to rest once one stage is obtained and it is necessary to keep looking for business. The interviewed referred that there is too large installed capacity for manufacturing paper products and production is too concentrated in large economic groups. The fiscal environment is not a favourable one also: equipment renovation has a shorter cycle than the fiscal law allows, so it can be stated that fiscal laws do not call for innovation. Another threat, as compared to other markets, is electricity cost that in Portugal is 15% higher than the European average and PAMPILAR industry depends a lot from electrical energy.

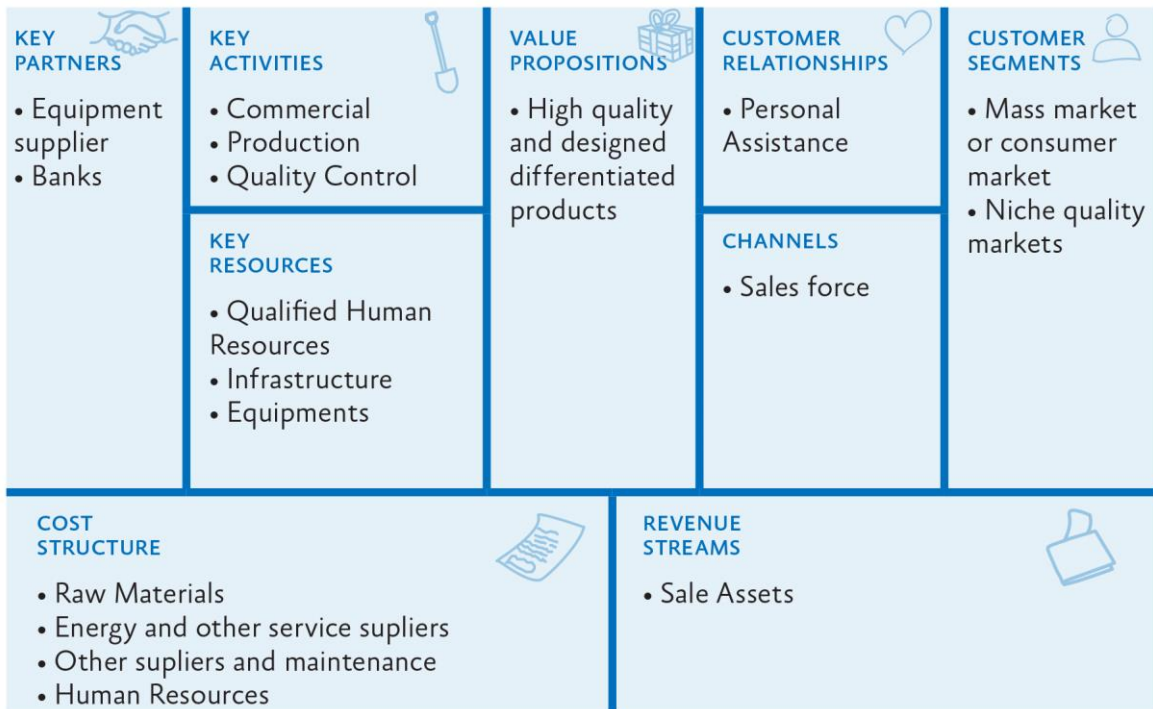
As far as Opportunities is concerned it has to be PAMPILAR itself to create their own chances. In a mature market that has a stable market value even if quantities increase, while margins are getting smaller, opportunities have to be created.

#### **CUSTOMER SEGMENTS, CHANNELS AND RELATIONSHIPS**

Customer segmentation shows mass markets with large distributors as main customers. As referred above the Sales force is the main channel to approach the customers. Loyalty is an important asset that has been nourished by the relations established with customers allowing the sales force team to get smaller. Other sales channels are not so important. As customers are large distributors, the personal assistance relationship is also important. Customers avoid impulse purchase. When they buy it is because they know the product is already sold.

**MAIN FINDINGS**

Based on the information collected during the interview the business model presented in the Figure 12 was built. Besides the BMC some main findings can be described.



Source: Author adapted from (Osterwalder and Pigneur, 2010)

**Figure 12 PAMPILAR “as is” Business Model Canvas**

- Technology is the main engine for production as innovation is the main engine for business in this matured market
- The equipment supplier is a major stakeholder in different phases of the development of the industrial project
- The negotiation with suppliers is a trump for the innovation processes
- Innovation sources come both from the market and from the customers.
- The Business model should be open to innovation

**4.5 Interviews Overall Results and Conclusions**

- A global analysis was carried out organizing all the information gathered through the interviews. Simultaneously, company information was checked using parameters and indicators thought relevant for a project- based service. Infrastructure, Operations and Strategy, were found to be the three business levels that support a project management service offered by a project- based firm.
- To make them more understandable, levels were breakdown into indicators. Those could be key indicators or not, but that is an unfinished and open issue. The final result is shown in Table 2. ECOBOM has weak means and tools but a good strategy environment, that may allow higher risks. PAMPILAR looks like it is the livelier company and needs to act that way to face a mature market. SOPSEC has a large and

heavy infrastructure and a difficult shrinking market, so it cannot run the risk of doing nothing.

**Table 2 Interviews - Key Business Indicators**

COMPANY	ECOBOM					PAMPILAR					SOPSEC					CRITERIA
INDICATORS	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	
<b>Infraestructure</b>	<b>14</b>					<b>18</b>					<b>15</b>					
1 IT Support		2							4				3			Basic IT- IT supporting processes
2 Sales/Human resources			3						4				2			Percentage
3 Knowledge how intensive		2						3							5	Low- High Degree of Education
4 Business model "as is"				4					4					3		not developed - developed
5 Business model "to be"			3					3					2			not developed - developed
<b>Operation</b>	<b>10</b>					<b>18</b>					<b>11</b>					
6 Project Management Tools			3					3					3			No concern - IT, Innovation Department
7 IT Changing Factors		2					2						3			No Change - IT supporting change
8 Stakeholders		1							5			1				No stakeholders - Along many phases of project
9 Willing to Innovate		2							4			2				Feel no need - Perception to innovation
10 Process Identified		2							4			2				
<b>Strategy</b>	<b>18</b>					<b>14</b>					<b>15</b>					
11 Regulatory Constraints			3					2						4		Many - Little
12 Customer Segment				5				3				2				Decreasing - Increasing
13 Customer Relationship			3					3						4		Online - personal assistance
14 Global Market Condition				5			2					1				Decreasing market size - GNP Growth
15 Economic Infraestructure		2							4					4		Weak - Diversified
<b>TOTAL</b>	<b>42</b>					<b>50</b>					<b>41</b>					

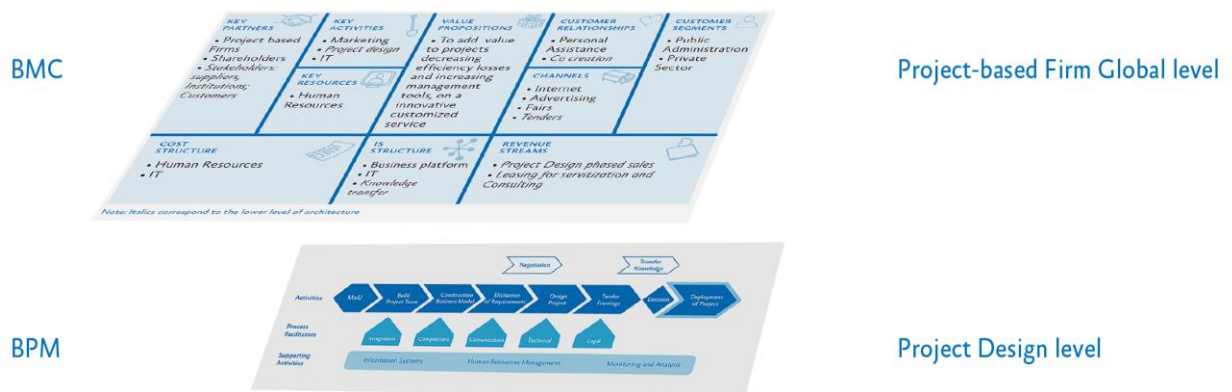
Source: Author

## 5 Business Model Architecture Proposal

### 5.1 Introduction

Every project is considered as a business. A project implies the existence of goals, a promoter, a technical study to support it, proven viability in economic or other terms, an investment capability and a return on the investment. Every project has a beginning and an end. One of the interviewed, an experienced business man, stated: “once a project is concluded it gets uninteresting. I have to start thinking about the next one. Improvement can always happen!”. Business environments are always changing and in order to keep businesses live, new goals have to be pursued, new projects have to be designed and executed. Meanwhile, with the advances of technology and of information systems, project life cycle is getting shorter. Most projects developed by project-based firms have to cope with this reality. And a project-based firm, like any other firm is also a business. So a project-based firm is a business in itself that helps creating other businesses.

Within this context, the business model architecture for project-based firms that is being proposed is built in two levels as represented in Figure 13: the business model for the firm (global level) and the project process for the firm’s core activity (lower level). For the



Source: Author

**Figure 13 Multi level Business Model Architecture**

business model global level the Business Model Canvas is proposed. The lower level groups project processes have their representation done by a process map.

The presentation of this proposal will start with the discussion of topics such as: Mission, Strategy, Goals and Objectives. Some highlights on Market and Marketing are also presented to illustrate initiatives in those fields. After presenting these topics, the Business Model and the Process Map are depicted in detail. The role of supporting activities, customers, shareholders, suppliers and financial institutions, on a general design of the project-based firm business model and in the project process is then presented and discussed. The business model is adapted from (Osterwalder and Pigneur 2010) as the Business Model Canvas (BMC). The reality of the project-based firm in a given economic context and with its



management rules is represented in a simple way through an adaptation of the BMC. The Process Map is composed of the activities that constitute the project design. It is a second level, below the global level, that depicts the core activity of the firm: the project design. The Process Map includes sub-processes or subsidiary processes, process enablers, factors that contribute to the project design process. Globally, the proposed architecture business model intends to answer to relevant questions raised by literature review, as well as those raised by the interviewed through the interviews and by the author's lifetime experience. Solutions are presented, namely for the tensions referred by (Sydow, Lindkvist, and DeFillippi 2004); the know how storage and share among firms; the after sales and the servitization factor (Vandermerwe and Rada 1989) related to long term relationships, among others. Information System support will also be included in the Business Model Canvas discussion.

#### **MISSION, STRATEGY, GOALS AND OBJECTIVES**

What can be the Mission Statement of a project-based firm designed to assist other businesses projects? The inefficiencies of a project can be seen as a source of improvement facets which open a new market of opportunities for Assistance as a Service (AaaS). At the same time, the observation of the project management knowledge areas may identify catalysers of project process improvement. This can be the Mission Statement.

The Strategy to be followed by the project-based firm should be aligned with the business model environment: the market forces are favourable to the growth of service sector coping with the international service growth tendency, the public sector is being privatized in Portugal thus enlarging the consultancy needs, and the private sector is replying to challenges both in the industry and in the tourism sectors. Market growth will be large enough to host project-based firms, the existing as well as the new ones. Socio economic trends enforce the demand for skilled projects designers, and public infrastructures are good for new businesses, in the Information System domain in particular. In what concerns legislation, many restrictions and constraints have to be overcome. Laws, regulations and rules are often not aligned with the challenges posed by the economic environment and the technology state-of-the art. They are sometimes restrictive and outdated, forcing business actors to circumvent them in order to find the most adequate solutions for each case.

The main Goal is to enter the market and within a few years to be a recognized player in project design. The proposal is that both the private and the public sectors, will use the same business model approach, certainly with more social and infrastructural concerns from the public sector. Another important difference between the public and private sectors is the tender phase activity. Nevertheless the Goal is the same: to enter the market of project design solutions for business projects and development projects for public and for private sectors in small and medium enterprises. The Objective is to start working to respond to market demand in the case of high performance projects.

#### **MARKET AND MARKETING**

Where is the market for projects to be designed by project-based firms? Which type of projects requires project management guidance and development embedding innovation? Many projects do, like the ones referred before in chapter 3. The project's contexts can vary a lot, but to a greater or lesser extent they can all benefit from efficiency and effectiveness improvement. So, potentially all projects are targets for the project-based firm service, both in the public and in the private sector. SMEs and the public sector appear to be the more

accessible market. In the medium term, industry in general as a market might have an increment as a consequence of the funding from Portugal 2020 Programs. Tourism is still a growing industry, so opportunities shall come from that side as well, and other areas such as environment management. One of the interviewed stressed the importance of keeping continuous attention to the market and to the market moves. Actually, this strong idea applies to all areas in a similar manner since the approach is similar in every case. Even if in the long term other project areas may be suggested, the ones already mentioned cover a scope wide enough for project-based activity. Competitors are there, in some market areas like construction. But projects are more and more needed by the market and there is an increasing number of people working on that. A most relevant issue is how do potential customers become aware of the project-based firm? For a new project base firm, with no brand value associated, the strategy is simple. Marketing will use the internet for advertising and brand creation, penetration prices will compensate the switching costs, and the firm will be positioned in the quality/innovation quadrant. It is also likely that personal relationships will play a role as well, since personal assistance is a privileged type of customer relationship.

## 5.2 The Business Model Canvas

The business model canvas is an exploratory tool offering a smooth and effective pathway for building business models. Despite the fact that most of the western economies are based on services, most of the models still come from the industrial sector of economic activity. An important point is that products and services are more and more difficult to separate, if it makes any sense to separate them. Servitization – the way to associate and add services to products and businesses – is nowadays part of innovation strategies. And it is also necessary to respond to customer demands for long-term relationships, since customers are more and more concerned with their operation results after ending their investment implementation phases.

The business model canvas has the advantage of being a recently standardized tool offering a comprehensive and integrated view that gathers a large experience on business models. It is a modern tool that was built through the participation of hundreds of experienced professionals concerned with business models. Service and project design is a complex process that requires, meetings, encounters, co-creation, creativity, groups, discussion, heterogeneity, multi-disciplinarily and somehow that is what the BMC and the book that is in its origin - Business Model Generation (Osterwalder and Pigneur 2010) - was able to tackle. To a great extent it justifies and gives the reason why BMC should be chosen to configure a new service to be provided. BMC has another advantage as a business model: it is a flexible and adaptable tool.

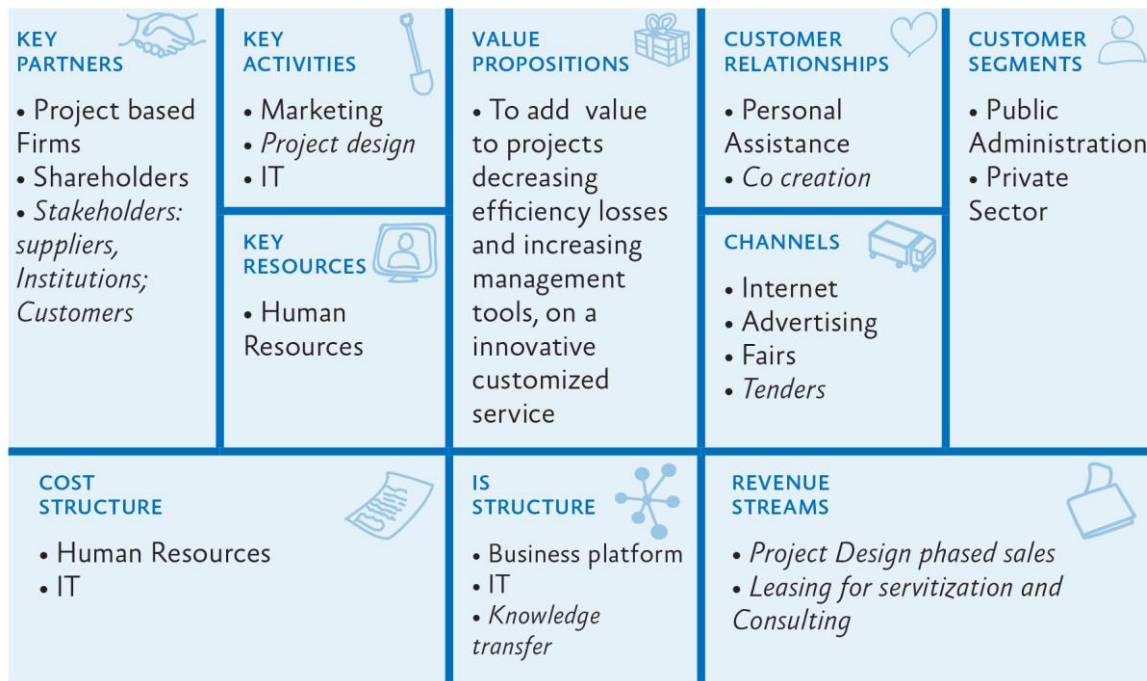
Considering that the four main trends in Information Systems are currently big data and business analytics, social networking, cloud and mobile computing, their impacts on a project-based firm are of utmost importance. Information Systems are indeed supporting system for all firm activities: human resources, accounting, salaries, technical software, and information flow. Information Systems are also virtually reaching all the objects through the concept of internet of things. And they are also tools supporting the innovation aspects of a firm business that it is starting its activity. Information System is always present at least in two building blocks of the BMC (and that is certainly the case of the “as is” BMC of the three companies interviewed), and there are specific activities related to them. For all the above

referred reasons and to give IS more visibility in terms of the business model, a specific block was added, the IS Structure block, to the Business Model Canvas.

Referring to the ten building blocks of the model, information on content will now be provided block by block, following the sequence proposed by the BMC authors and are presented in Figure 14.

The *value proposition* presents the reason why the proposed service is available and why it is worth using this service instead of others services offered by competitors that might have the same global objective. What is worth offering customers? Certainly a better project, less losses in resources and a better usage of state of the art management tools, in an integrated way. In short, it is what is to be offered to customers.

The *customer segment* identifies the groups of customers that are targeted by the value proposition. The need is there, even if there is low awareness of that need among Customers. In the case of a project-based firm one has to consider the mass market – the service is to be available to any firm who wants a project do be deployed. Two main customer segments are considered in particular: the public sector, the public administration at national, regional and local levels, and the private sector particularly the small and medium enterprises and organizations. Projects are customized and in the long term some long tail effect, due to



Note: Italics correspond to the lower level of architecture

Source: Author adapted from (Osterwalder and Pigneur, 2010)

**Figure 14 Project-based Firm “to be” Business Model Canvas**

market segmentation in small niches that may occur as a result of project specialization. This may be relevant in defining customer segments. That fragmentation may happen in the short mid-term with the large number of projects triggered by the Program Portugal 2020, in the Industry and Tourism sectors. The health and related activities are promising customer segments as well, but many other examples could be given. As referred by PAMPILAR it is important not to be dependent on one customer only or on one customer segment only.

The *customer channels* identify the channels used to reach the customer segments. For an unknown project-based firm awareness creation is a major goal as far as customer channels

are concerned. The internet can be the main tool for a start, given the lower costs of digital advertising. Advertising in business newspapers and magazines can be used as well as to participate in business fairs. The word of mouth may certainly become very important in the mid-to-long-term particularly in project-based firms.

The *customer relationships* – the relationship between the firm and the customer – in project-based firms, where all projects are highly customized, first of all requires personal attendance and sound and stable personal links. Effective communication with project owner is fundamental in the different phases of project development. There are many potential and effective touch points with customers. Wishfully, in many cases when the communication between firm and customer gets regular and a balanced involvement of both parties is achieved, co-creation takes place. This means that technical issues, targets, responsibilities, tasks, risk and other project management aspects are shared.

The *key resources*. Project-based firms services are customized and knowledge intensive, which means that human resources are a key resource. Another important resource is the information system, a generic tool closely attached to the human resources, and crucial to support communication and information flow, this will be referred in a single BMC building block.

The *key activities* include strong marketing in the short term as well as Information System development, legal engineering and advisory, project design and servitization. Project design and servitization, high value added activities, and also networking and integration fit in the lower level of the architecture.

The *key partners* group the counterparts of the project: the shareholders, the stakeholders and the customers. Key partners act in different areas, such as quality, evaluation, validation of communication and information flow, among others. It involves many touch points through different channels, prior and during the business process, in all aspects covered by the business model architecture. Key partners can participate in the BMC project design using brainstorming and other participatory methods. Partnerships are an exponentiation factor for the development of project design.

The *cost structure* follows the pattern of the specific professional sector, according to Schmenner Service Process Matrix. The operations (project design), with a close link with human resources, are the major value adding chain activity, as in Porter's value chain. First main cost comes from human resources and right after the IS supporting activity. Project design cost structure also includes a financial plan.

The *Revenue Streams* work as a phased asset sale on project design, from one side, and as leasing or fixed fee engagements, on servitization or consulting, on the other side. Consulting is also associated with midterm long tail effect in the customer segmentation and in the revenue stream.

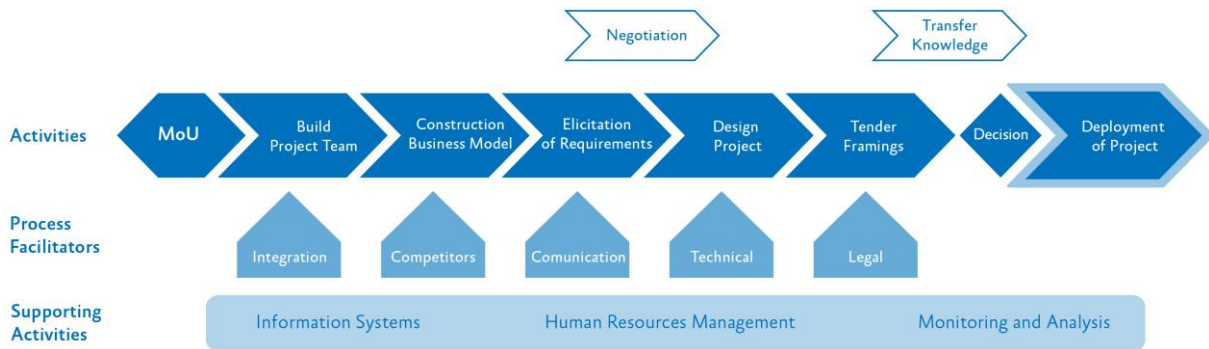
The *Information System infrastructure*. The main vectors of the IS infrastructure are the business platform that supports the business (for instance *ptempresascloud*); the assistance as a service technology; and the platform to support the knowledge transfer. This later will allow relevant information obtained during project design to be stored in an appropriated repository, as well as the use of that repository as a source of information for project design. The IS infrastructure is also of critical importance to workflow and communication.

### 5.3 The Business Process Map

As referred before, there are two major types of projects: the business projects whose final result is not placed in the market; and the development projects creating a new player – or modifying an existing but thereon a different one – in the market. In both cases project design is required. The fact that there is a project level with its own business model is due to the fact that project design only starts when there is a trigger event - an agreement between the firm and the customer. Prior to that agreement, there was already business, there was already service encounter. The firm and the customer were involved in a process that ended in an agreement where goals – a contract or a MoU – were defined allowing the project to gain life. There is also a business environment offering the project a context favourable for an agreement to be attained. The model of a project or the process map of a project is therefore already bounded by previous constraints. It is still a business with its own risk, as the project may succeed or not. A business project “usually succeeds” (the output is not measured by market) if not misused, but a development project can fail more easily. All this will depend in a great measure on the owner (the manager or the entrepreneur) perception or perspective on the project itself. The Project Design Process Map is shown in Figure 15.

#### TRIGGER EVENT

The project process map trigger event is the contract or the MoU between the customer and the firm, the kick off move that occurs when the project is due to begin. Main goals are defined when the agreement is settled, but a decomposition of those goals is usually necessary.



Source: Author

**Figure 15 Project-based Firms – Project Design Business Process Map**

#### BUILD THE PROJECT TEAM ACTIVITY

The Building of Project Team activity begins by analysing the terms of the project, that is the memorandum of understanding, the contract or the documents that establish a business case. Those documents will help defining which are the relevant knowledge areas of project management that have to be considered during project execution. Customers have a strong influence in that phase and their intervention should be carefully handled. It is important not only to find out what customers really want, but also to confront them with that reality so that they have a clear knowledge about the choices made, and they approve it. According to the

type of project and with aim of building synergies, the project may be included in a portfolio or in program. This will depend on the customer having other similar projects running on the project-based firm, or if the project is identical to others already executed or being executed by the project-based firm. The choice of the project team members is part of this activity, requiring carefully assigned tasks and responsibilities shared among team members. The Project Manager will be chosen taking in consideration the skills (technical as well as soft skills) of the team members and not specially the position of those members in the organization. Actually, the project manager may not belong to the project-based firm. It is also important to define the type of relationships, communication rules and channels among team members. The inputs, as referred above, are project guidelines depicted in a contract or a Memorandum of Understanding and the output is the Mission Statement and project scope, the project team and a project management general frame.

#### **CONSTRUCTION OF BUSINESS MODEL ACTIVITY**

The activity that follows is the “to be” Business Model Canvas construction for the project itself. This is based on the BMC as developed in the global level of the architecture. The project is seen as a business, depending on its context and nature. Whether it is a new production line like PAMPILAR’s, or a public administration building or a hotel, designed by SOPSEC. Each case will have a different business context – it should not be forgotten that projects are customized and one-of-a-kind – so it is important to understand how, each project relates with its own context. This justifies the “to be” business model. Considering the business context, the business model will be measured by different indicators not just economic indicators. It comprehends or may include other variables, environmental, cultural, social, risk, and in certain cases regional (local) parameters.

The “to be” business model will thereon guide the project design and management. Unlike the BMC that was built for the global level of architecture, which is unique for the project-based firm, the project BMC is different for each project designed by the project-based firm. The input for business model generation is the mission statement and the memorandum of understanding and the output is the Business Model Canvas for the project.

#### **ELICITATION OF REQUIREMENTS ACTIVITY**

To understand and to approach a project the activities have to be detailed and broken down. The proposed way to approach a project’s content is to do it through a requirements list. It is suggested that only functional and quality requirements are defined. Non-functional requirements (used by some authors) are not well defined requirements that need further work in order to clarify if they are functional or quality ones (Pohl 2010). Requirements shall be elicited from customers, stakeholders, designers and other players. Other sources of information are necessary to build requirements, namely those related with the legal environment. Requirements include rules, union regulations, relevant national and European laws concerning the “to be” business model variables. Requirement analysis is of paramount importance because it is in the beginning of the project that changes are easy and at no relevant cost. Requirements input are the business model, the Memorandum of Understanding, the mission statement and the business model. The output is a documented solution that will support the project design.

**DESIGN PROJECT ACTIVITY**

The project is designed to fulfil the established requirements. A project is the response to those requirements, a solution that answers to the questions raised by the initial project design process activities. Project design is an activity that deals with a large amount of data as an input, transforming it in another large amount of information as an output: the project data and specifications. It is the phase of the process where, for the first time, the owner (the customer) can evaluate, with a high degree of certainty, the cost for the project development. The project design inputs are the requirements and the output is the project solution and specifications, that will support the call for proposals for project execution.

**TENDER/FRAMING ACTIVITY**

The Tender activity of the business process map applies only to organizations that have to go through tenders to choose the entity that is going to execute or deploy the project. That is the case of public administration services at all levels. More often than not, tender excludes the negotiation but if well planned negotiation took place before, during the business model construction and requirements activities. Still the tender activity is a win-lose negotiation, where only one tender competitor wins – all the others loose - and the owner (the customer). wins the lowest price tender proposal. Framing applies to organizations that do not need to go through tender. All documents related to project design are assembled and organized in a sort of a business case. Tender inputs are documented specifications and project design. Tender output is a proposal for key partners at a certain cost. Framing output is the project itself, is the synthesis of all project management, with some authors calling it a Business Case, ready to support a decision.

**DECISION**

The Decision is a milestone of the Project Design Process Map. It is a moment of truth when the owner decides to develop the project and all project management is synthesised in that decision.

**DEPLOYMENT OF PROJECT**

The Project Deployment it is a process in itself. It was included in this process map to show that many aspects related with the project design occur only after the decision is made. It was previously mentioned in this dissertation that the project or business long term commitments and servitization, are being increasingly required by customers. Operational results, assistance to operation, financial duties and links between customer and project design, knowledge generation, supplier's assistance and maintenance, are examples of project development activities that are associated with the project design process - since the very first activity.

**NEGOTIATION SUBSIDIARY ACTIVITY**

The subsidiary activity of Negotiation is a challenging activity through which the owner and the stakeholders involved try to reach the best possible solution for a given case. Negotiation is linked with internal innovation regarding technical solutions, with impact on costs, time and efficiency and with consequences in business model indicators. It is an activity involving a high level of communication and human resources management, including stakeholders, customer and suppliers. A convergent iteration is usually followed to elicit the best solution – a win-lose negotiation phase should be followed by a win-win negotiation phase. Negotiation is a fundamental process in service and project design. Sometimes the negotiation source is

not clear and it has to be searched and explored until negotiation becomes an effective tool. Negotiation also helps building requirements. Negotiation inputs are requirements and project design, and the outputs are transformed requirements. Negotiation is a cyclic activity that triggers innovation in different phases and different areas of project design development.

#### **KNOWLEDGE TRANSFER SUBSIDIARY ACTIVITY**

Project design is a knowledge intensive process, but it is mainly a customized and unique project for a given goal that involves research and information gathering. The project design process also generates new knowledge, that is used during the project but that may also be used in the future, the knowhow. Unless that knowledge is brought by the project designers to a future project – and this is always happening - there is no other way to convey and keep this information for future purposes. It is, though, suggested that project design might be linked to a scientific institution – like a university research centre – that may manage the knowledge acquisition and repository for future use. A simple way of doing it can be achieved by project designers producing scientific papers, supervised by the university or scientific institution, where the main project results can be depicted. That has to be done in full respect of privacy of data that many projects require.

### **5.4 The process enablers**

#### **INTEGRATION**

Integration is necessary to establish and maintain balanced interaction among all project management knowledge areas, helping to define and keep the right project scope and the mission statement. It's a crucial aspect of project management to assist in aligning the different facets and areas of the project and to have an adaptable project as referred by (Giesen et al. 2007).

#### **COMPETITION**

During the phase of business model definition it is important to identify and target competitors – what is their market share, market positioning, brand, pricing, etc. This will allow the correct positioning of the new project at the time the business model is being built.

#### **COMMUNICATION**

Good and effective Communication is a key factor for the development of a project. Depending on the type of the projects, there are more or less actors that interact with project design, both internal and external to the project team. Partners, suppliers, stakeholders in *latus sensus*, customer, public administration, institutions, universities, they all intervene. Some are required for elicitation of project requirements, others to deploy tasks, to negotiate, to analyse or to validate. The communication channels among all actors have to be open and clearly defined. Workflow information has to circulate smoothly among all stakeholders. Protocols and procedures have to be used to identify and regulate these communication channels. A good communication performance is a guarantee for a better and more efficient project.

#### **LEGAL**

Both in the private and in the public sector specific legislation applies and interferes to project design. In many countries public contracts are strongly much conditioned by laws and regulations which tie and frame all project processes both before and after the tender activity. In the private sector, legislation is relevant and may put constraints with projects viability.



Accounting, financial, labour and environmental regulations are examples of types of legislation that possibly affect project design (indeed these are important aspects for public sector projects as well). Besides these, the national laws and regulations that cover the activities have to be considered. To know the relevant legal aspects is essential. Often a detailed knowledge may even help to optimize the use of resources and/or to extend the breath or scope of the project.

#### **TECHNICAL**

Technical components comprise the engineering technics that are required to support the project design. Engineering is considered in a broad sense, including not only the traditional engineering skills but also economical and financial.

### **5.5 Supporting Activities**

The supporting activities are also represented in the Figure 15. Human Resources management is a core support activity since the project-based firm is a knowledge intensive business, and therefore there is an intensive use of qualified human resources. It is necessary to increase workers productivity and to make their work add more value in the value chain, management and training are needed.

Information Systems are also an important factor as mentioned before. The level of importance may change with the type of project, but information flow, assistance as a service, knowledge transfer and expert use of technical tools (software) that support project design, cannot be discarded. Of course other IS tools for managerial purposes of the project-based firm are also required. Finally Monitoring and Analysis of project design performance is a key activity along all the process. Project performance indicators are important to measure the most critical factors, allowing both qualitative and quantitative appraisals. All project activities have to be evaluated by indicators.

## 6 Conclusions and Futur Developments

### 6.1 Conclusions

The main results and conclusions of this dissertation “ Business Model Architecture for Project-based Firms” have somehow been addressed in the previous chapter to support the Proposal. They can be synthesised as follows:

- Despite the fact that the service sector is the largest economy sector in developed countries, the effort in research in the area has been comparatively smaller than what has been put in the industry sector. This is particularly true in the case of project-based firms.
- The business model architecture for a project-based firm consists of a two level architecture. The global level comprehends a business model that embraces the project-based firm and establishes a relationship with the market where the firm operates. The lower level comprehends the project design business process.
- A project-based firm is a firm that designs projects for customers - both business projects and development projects. Those customers look for assistance or require assistance when they want to build or deploy their projects in an efficient and effective way.
- Customers are usually the owners of the project and it is their perspective that is most relevant when analysing project design and project success.
- A project-based firm supplies services to many different types of organizations and firms of both the private and the public sector. Differences can be very relevant from public to private sector.
- The Project-based firms involved in project design are typically small firms that work in network and mainly with other project-based firms. They are in business, building partnerships with other firms, modelling their business shape according to customer needs and the required skills of the project being designed.
- Project-based firms are flexible and need to have system integration as a core capability.
- Project design is a unique customized task. There are no two equal projects, as there are no two equal sets of requirements for project design.
- Project design is a service, co-created with customers and other stakeholders. It is a customer oriented business-to- business service.
- Project design is the main source of value for the project-based firm.
- The project-based firm is integrated in the society and offers a contribution to the society, creating value and sharing know how with the community.

### 6.2 Future Developments

Literature on business models is, in most of the cases, based in top western economy case studies involving large companies. Small and Medium sized businesses do not deserve the

same attention from the researchers as large corporations and that is hard to understand, since they are crucial stakeholders in today's economy. New service design is a new field of research linked to commercial activities, production and selling goods or services. Project management is the third area of research in this dissertation and it is the one that covers a wider range of business types within the economy sectors. It should be pointed out that there is a general lack of research and literature covering project-based firms activities.

Having said that, and considering the specific methodology developed in this dissertation, further work in the business model architecture may include:

- To enlarge the scope of data collection to the other service process matrix quadrants, namely the mass service and the service shop. Data collection is a rich process to find critical weaknesses of projects and project development, being also one of the development sources used to design both the global level and the lower level of the business model architecture.
- To develop further research on the so-called subsidiary activities of the model lower level, the project business process: both the "negotiation activity" and the "knowledge transfer activity". The "negotiation activity", being fundamental for project innovation and a component of the co-creation, can be more detailed in order to become a stronger project design tool. The "knowledge transfer" is a way of assuring that know how is always increasing both in technical and scientific grounds. However, since it usually has no short-term results it is somehow neglected.
- A third area where further developments can be undertaken is definitely the project deployment process. This regards the existing relationship between the customer and the firm and between the long-term and the short-term aspects of project design. The long-term relationship is increasingly adding value to both business and project.

Project-based firms work on projects that, at the beginning, deal with ideas, with opportunities, with plans, with survival, with visions, sometimes with dreams. Most often, intangible realities are themselves the trigger to transform them into something more concrete – a project – for a better future.

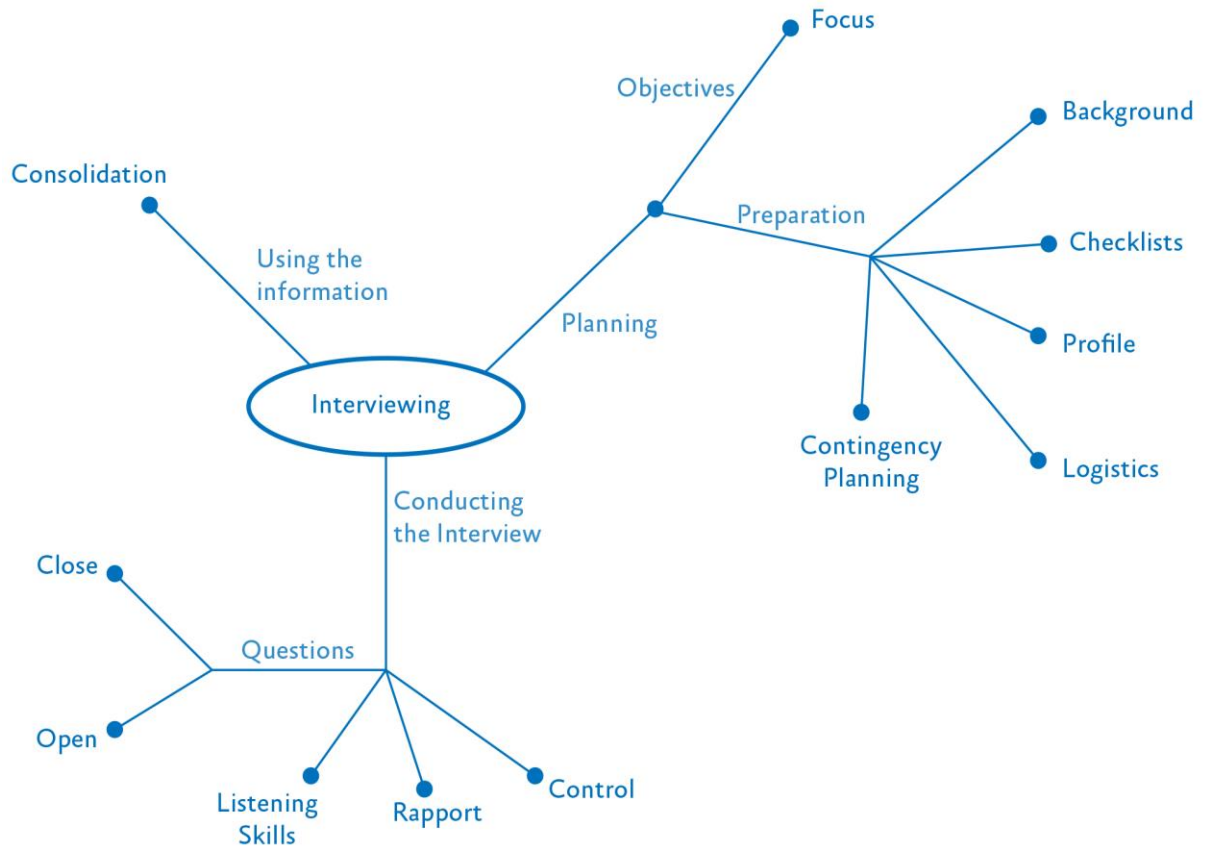
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**ANNEX A: Interview Guidelines**

As referred in the text the interviews were conducted by the author and were prepared according to the diagram:



Source: Case Method: business interviewing (Hickman, 1994)

The interview guidelines were sent to the interviewed before the interview and are shown below:

**INTERVIEW GUIDELINES**

**Objectivos**

- Conhecer as fragilidades que uma empresa enfrenta na gestão de projectos.
- Averiguar até que ponto é útil uma assessoria externa para a gestão de projectos.
- Caracterizar a empresa para efeitos de uma gestão inovadora.

**1. A Empresa**

1.1 A Organização

Qual é a proposta de valor?

---

Tipo de Organização (organograma); Funcional \_\_\_\_; Horizontal\_\_\_\_; Matriz\_\_\_\_ Outra\_\_\_\_  
 Número de pessoas na organização\_\_\_\_\_

Ameaças \_\_\_\_\_

Oportunidades \_\_\_\_\_

1.2 Clientes

Quais os canais de aproximação(%): Internet\_\_\_\_; Media\_\_\_\_; Força de Venda\_\_\_\_  
Publicidade\_\_\_\_; Informação pessoal\_\_\_\_; Concursos\_\_\_\_; outros\_\_\_\_\_

1.3 Stakeholders

Internos à organização:

Financeiros

RH

Produção

Contabilidade

Aprovisionamento

Gerencia

TI

Outros

1.4 Financeiro

Estrutura de Custos(%): RH\_\_\_\_; Instalações\_\_\_\_; TI\_\_\_\_; Fornecedores\_\_\_\_; Parceiros\_\_\_\_  
outras\_\_\_\_\_

Receitas (%): Vendas a Clientes\_\_\_\_; Capital\_\_\_\_; Alugueres\_\_\_\_;Parceiros\_\_\_\_; outras\_\_\_\_

1.5 Tecnologias de Informação

Tem um Sumário Estratégico-Operacional?\_\_\_\_\_

Tem Factores de Mudança?\_\_\_\_\_

Serviços informáticos In house \_\_\_\_\_Outsource\_\_\_\_\_

Comunicam internamente por Intranet\_\_\_\_ Internet\_\_\_\_?

**2. Projecto**

2.1 Escolher um projecto

Nome \_\_\_\_\_

Tem um \_\_\_\_\_ ou mais \_\_\_\_\_ projectos em curso?

Quem é o Cliente? \_\_\_\_\_

Tem mais projectos com esse cliente (S/N)? \_\_\_\_\_

Tem mais projectos do mesmo tipo (S/N)? \_\_\_\_\_

O projecto está integrado num Portfolio(S/N)? \_\_\_\_\_

O Projecto está integrado num Programa(S/N)? \_\_\_\_\_

Qual a duração prevista do projecto? \_\_\_\_\_

O Projecto está dividido por fases (S/N)? \_\_\_\_\_ Quantas fases? \_\_\_\_\_

O projecto é gerido em que áreas? Integração\_\_\_\_; Ambito\_\_\_\_; Prazo\_\_\_\_; Custo\_\_\_\_;

Qualidade\_\_\_\_; RH\_\_\_\_;Comunicação\_\_\_\_; Risco\_\_\_\_; Aprovisionamento\_\_\_\_;

Outro\_\_\_\_\_

---

### 1.2 Equipa de Projecto

Tem chefe de projecto(S/N)\_\_\_Pertence à Organização(S/N)\_\_\_; Como é escolhido?\_\_\_\_\_

Tem equipa de projecto(S/N)?

### 2.2 Stakeholders

Exteriores à organização:

Cliente

Fornecedores

Ent. Públicas

Sub contratos

Parceiros

Consultores

Outro

---

Comunicação entre elementos/parceiros. Têm(S/N)?:

Procedimentos\_\_\_;protocolos\_\_\_; email\_\_\_;Internet\_\_\_;Extranet\_\_\_;

Formulários\_\_\_;redes sociais\_\_\_\_\_

---

### **3.Como inovar nos projectos e na empresa**

3.1 Constrangimentos e dificuldades

3.2 Como ultrapassar e resolver ?

3.3 Como pode a arquitectura de um modelo de negócio ajudar:

- a desenhar o modelo de negócio da empresa
- a desenvolver uma estratégia
- a gestão das operações



## ANNEX B Glossary

### Glossary

Business case	A documented case to be presented to a decision maker which includes all information required to support and start a project.		
Business Model	Describes the rationale of how an organization creates delivers and captures value	Osterwalder, 2010	Business Model Generation
Business process	a structured, measured set of activities designed to produce a specific output for a particular customer of market	Davenport ,1993	: Process Innovation: Reengineering Work through Information Technology
Business process	A business process is a collection of interrelated activities, initiated in response to a triggering event, which achieves a specific, discrete result for the customer and other stakeholders of the process.	Alec Sharp, Patrick McDermot,2009	Workflow Modelling
Business process	procedure relevant for adding value to an organization	Scheer, 2000	ARIS Architecture and Reference Models for Business Process Management
Changing factors	A desirable state of a firm due to an assertion about the company or about their external environment with relevant impact on it's activity	Vaz Velho, 2004	Arquitectura de Empresa.
Enterprise	a set of projects and actions that are required to develop in order to achieve predefined goals		
Entrepreneurial	that relates to enterprise or endeavor		
Model	Simple representation of a complex reality		
Procedure	A repeatable sequence of activities		
Process	A sequence of activities that use resources to transform inputs in outputs		
Project	A temporary endeavour to create an unique product, service or result	PM Institute, 2008	Guide to Project Management Body of Knowledge
Project Based Firm	Firm which core activity is to design projects		
Project Led Firm	Firm created to design/ implement a project		
Project Management	Application of knowledge, skills, tools and techniques to project activities, to meet the project requirements	PM Institute, 2008	Guide to Project Management Body of Knowledge
Requirement	a statement that identifies a product or process operational, functional, or design characteristic or constraint, which is unambiguous, testable or measurable and necessary for product (or service) or process acceptability.	Pohl, Klaus , 2010	Requirements engineering: fundamentals, principles, and techniques
Servitization	The act of adding services to a business		
Workflow modeling	visual representation of workflow as a sequence of steps interpreted by actors, and their dependencies		