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Master Thesis

**Internationalization of Construction Professional Service Firms-
Overcoming challenges in mature markets**

The case of Proef Group in the mature western European Market

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Abstract

Service firms are gaining more importance in today's global economy, with its presence expected to increase in years to come. A lot of research has been done concerning the internationalization of manufacturing firms and only in recent years researchers have been trying to adapt models of internationalization to service firms. However little is known about internationalization strategies of specific types of service firms such as construction professional service (CPS) firms even though construction industry is in a rising point. In this Master thesis I plan on investigate the internationalization strategy of CPS firms and understand how they overcome challenges in mature markets that present interesting problems. For this purpose, the case of engineering CPS firm, Proef Group is analyzed, as it has encountered different challenges in their current process of internationalization and overcame (and is overcoming) them in a successful way. This thesis draws on a case study using a qualitative approach with data gathered from interviews, among others, with the Strategy and Management Control Manager and members from the Executive Committee of the company. The findings reveal insights about challenges faced by a CPS firms and how they overcome those challenges using specific strategies in mature markets. The barriers (i) reputation, (ii) local preference, (iii) language, (iv) lack of qualified labor in the host country (v) dichotomy between Portuguese employees and local employees and (vi) local subcontracting, take on a major part in challenging a CPS firm's internationalization process to a mature market. The strategies (i) localization, (ii) alliances/partnerships, (iii) track record, (iv) firm's competitive advantages, (v) mix of employees from Portugal and local employees, (vi) expatriation of employees from Portugal and (vii) innovation are considered crucial in overcoming the presented challenges.

Keywords:

Challenges, Strategies, Construction Professional service firms; Internationalization strategy; mature market; engineering services; Europe.

RESUMO

As empresas de serviços estão a ganhar cada vez mais importância na economia global de hoje, com sua presença prevista para crescer nos próximos anos. Muitas pesquisas têm sido feitas sobre a internacionalização das empresas de manufatura e apenas nos últimos anos tem havido uma tentativa de adaptar modelos de internacionalização às empresas de serviços. No entanto, pouco se sabe sobre estratégias de internacionalização de tipos específicos de empresas de serviços, como empresas profissionais de construção de serviços apesar da indústria de construção estar uma fase de crescimento atualmente. Na presente Tese de mestrado pretendo investigar a estratégia de internacionalização das empresas CPS e perceber como estas superam desafios em mercados maduros que apresentam interessantes barreiras. Para tal, o caso da empresa de engenharia CPS, Proef Group, é analisado, pois trata-se de uma empresa que enfrentou diferentes desafios no seu processo atual de internacionalização e superou (e está a superar) os mesmos de forma bem-sucedida. Esta tese baseia-se num *case study* utilizando uma abordagem qualitativa com dados recolhidos a partir de entrevistas, entre outras fontes, com o Manager de estratégia e gestão de controlo e membros do Comitê Executivo da empresa. Os resultados revelam um discernimento acerca dos desafios enfrentados pelas empresas profissionais de serviços de construção e como estas os superam em mercados maduros. As barreiras (i) reputação, (ii) preferência local, (iii) linguagem, (iv) falta de mão-de-obra qualificada no país anfitrião (v) dicotomia entre empregados portugueses e empregados locais e (vi) subcontratação local, apresentam um desafio para o processo de internacionalização de uma empresa CPS para um mercado maduro. As estratégias (i) localização, (ii) alianças / parcerias, (iii) histórico, (iv) vantagens competitivas da empresa, (v) mix de empregados de Portugal e colaboradores locais, (vi) expatriação de colaboradores de Portugal e (vii) a inovação são consideradas cruciais para superar os desafios apresentados.

Palavras- Chave:

Desafios, Estratégias, Construção Empresas de serviços profissionais; Estratégia de internacionalização; Mercado maduro; serviços de engenharia; Europa.

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Table of contents

1. INTRODUCTION	9
2. LITERATURE REVIEW	11
2.1 Definition of service firms and overview on construction Professional service (CPS) firms	11
2.1.1 Definition of service firms.....	11
2.1.2 Overview on construction professional service (CPS) firms	12
2.1.2.1 Overview of the sector	12
2.1.2.2 Characteristics.....	13
2.2 Internationalization strategy of a CPS firm.....	14
2.2.1 Definition of internationalization	14
2.2.2 Drivers of internationalization of construction service firms.....	15
2.2.3 Market entry strategy.....	16
2.3 Challenges of internationalization of a CPS firm	19
2.3.1. Challenges faced by the internationalization of firms	19
2.3.2. Challenges from the internationalization of CPS firms.....	20
2.3.2.1 Reputation.....	20
2.3.2.2 Foreign country disadvantage	20
2.3.2.3 Political and economic instability.....	20
2.3.2.4. Human resources.....	21
2.3.2.5. Technical restrictions.....	21
2.3.3 Summary of challenges in the literature	23
2.4 Strategy to overcome the challenges.....	24
2.4.1. Success factors.....	24
2.4.1.1 Competitive advantages.....	24
2.4.1.2. Qualifications.....	25
2.4.1.3. Human Resources	25
2.4.1.4. Partnerships.....	26
2.4.1.5. Flexibility.....	26
2.4.1.6. Innovation.....	26

2.4.2. Summary of success factors in the literature	27
2.5 Overcoming Challenges in a mature market.....	28
2.5.1 Gap in the literature	28
2.5.2. Challenges in Developed markets.....	28
3. METHODOLOGY	30
3.1 Research method	30
3.1.1. The case study methodology	30
3.1.2. The company	31
3.2. Data collection	32
3.3. Data Analysis	33
4. CASE STUDY	35
4.1 Overview of the company	35
4.1.2 The Business.....	36
4.2 Internationalization Process	38
4.2.1 Internationalization to European markets.....	38
5. FINDINGS.....	40
5.1. Internationalization process	40
5.2 Barriers faced by Proef when internationalizing to western European markets and respective strategy.....	42
5.2.1 Reputation.....	45
5.2.2 Local Preference	47
5.2.3 Language	48
5.2.4 Lack of qualified labor in the host country	49
5.2.5 Dichotomy between local vs Portuguese employees.....	50
5.2.6 Local subcontracting	51
5.3. Innovation	53
6. CONCLUSIONS	54
8. APPENDIX.....	56
9. REFERENCES	65

List of tables

Table 1- Summary of the Challenges faced by CPS firms	23
Table 2 - Summary of success factors of CPS firms	27
Table 3 - Interviewers description	33
Table 4 - Part of the coding table.....	34
Table 5 - Literature vs findings.....	42
Table 6 - Europe Operational plan 2020, Proef Group.....	60
Table 7 - Sources of data collection for the case study	60

List of figures

Figure 1- Modes of Supply of service firms	17
Figure 2- Grouping Entry Modes Regarding Mobile v. Permanent	18
Figure 3- Number of measures in construction and related engineering services	22
Figure 4 - Important marks in the firm`s history	36
Figure 5 - Scheme of the findings – 6 Challenges and specific strategies.....	44
Figure 6 - Employment by occupation in construction.....	56
Figure 7 - Penetration September 2016	57
Figure 8 - Penetration at Sept 2016	57
Figure 9 - Minimum wages by country, 2017	58
Figure 10 - Consolidated turnover in millions of euros (2013- 2017) of Proef Group.....	59
Figure 11 - Aggregate turnover in millions of euros (2013- 2017) of Proef Group	59
Figure 12 - International ranking of Portuguese companies 2016.....	62
Figure 13 - Proef`s Business areas.....	63
Figure 14 - Proef Enginnering enterprises of Proef Group.....	63
Figure 15 - Diversified portfolio in the Telecommunications area	64
Figure 16 - Strategic map Proef 2020	64

ACRONYMS

ADSL	Asymmetric Digital Subscriber Line
CPS	Construction professional service
CODBA	Cost of Doing Business Abroad
CEO	Chief Executive Officer
COO	Chief Operating Officer
CSAs	Country-specific advantages
CSFs	Critical Success Factors
EU	European Union
FDI	Foreign Direct Investment
FSAs	Firm-specific advantages
FTTH	Fiber To The Home
Gats	General Agreement on Trade in Services
GDP	Gross Domestic Product
ICT	Information and Communication Technologies
ISIC	International Standard Industrial Classification
JV	Joint Venture
LOF	Liability of Foreignness
M&As	Mergers and Acquisitions
PPPs	Public-private Partnerships
SMEs	Small and medium-size companies
SV	Sole Venture
WTO	World Trade Organization

1. INTRODUCTION

Globalization has introduced the easy enter of competition in the global markets, leading firms to internationalize in order to seek new projects. Today`s economy growth and export competitiveness is depending more and more on the service sector (Cattaneo et al., 2010). Services are nowadays easily traded internationally, helped by technological progress and the increased mobility of persons (Cattaneo et al., 2010). Service firms that focused mainly in their home country in the past are today pursuing international strategies with high investments abroad, opening subsidiaries in international markets. In 2014 the service sector accounted for 64 percent of global Foreign Direct Investment (FDI) stock, almost tripled than the manufacturing (UNCTAD report 2016¹). However, Merchant and Gaur (2008) found that “less than 7 percent of studies published during the recent 20 journal-years (44 studies out of 654) focus solely on the non-manufacturing sector” (p.385) Research until now has focused mainly on internationalization of manufacturing firms and recent ones solely on explaining the differences between their models of internationalization and those of service firms.

Additionally there is also lack of research about the internationalization of different types of service firms: namely construction service firms (Panibratov, 2008). The existent articles focus on the internationalization process of firms of specific national origin, e.g. Malaysian (Isa et al., 2015), British (Crosthwaite, 2000) or Chinese (Ling et al., 2005).

There is a need to develop the existing literature by studying specific sectors that have not been the focus of earlier studies.

Construction industry is already one of the largest industry sectors generating about 9% of GDP in the European Union (EU) and providing 18 million direct jobs according to the European Commission 2017²³. The volume of construction output is expected to represent \$15.5 trillion worldwide by 2030 (PwC Report - Global Construction 2030, 2015⁴). The observable gap in the literature regarding this specific service sector must be covered as construction industry seems to be in a rising point.

¹ http://unctad.org/en/PublicationsLibrary/wir2016_en.pdf

² https://ec.europa.eu/growth/sectors/construction_en

³ https://ec.europa.eu/growth/sectors/construction_en

⁴ <http://www.pwc.com/gx/en/industries/engineering-construction/publications/pwc-global-construction-2030.html>

In this thesis I will focus on challenges in mature markets. In regard to the construction industry, researchers are focusing on problems construction firms find in emerging countries and problems faced by firms from emerging countries. Mature markets have been neglected even though there are many specific drawbacks in entering a developed market. Authors focused on challenges of the sector in general (Proverbs et al., 2000) or in the ones specific to emerging countries (Ofori, 2000; Thwala and Mvubu 2009; Freeman and Sandwell, 2008). Moreover, studies have been focusing on the challenges faced by CPS firms or success factors essential to a firm's success but there is a lack of literature in linking the identified challenges with possible strategies to overcome these specific challenges.

Therefore my research question is: "How construction professional service firms overcome challenges in mature markets". To answer my research question I start by identifying the difficulties faced by CPS firms in the internationalization to mature markets and in a next step understanding how firms face the specific challenges.

For this purpose, a methodology based on a case study approach is used. In this thesis I analyze the case of PROEF Group, a Portuguese engineering CPS firm that faces some challenges along its expansion process to the western European market but has been managing to overcome them in successful way until now.

The structure of this Paper, starts with a literature review, chapter 2, for an understanding of the theoretical background with a review on prior knowledge on this thesis' research topic. Chapter 3 follows with a look through the methodology process, where the approach used to answer the research proposal is explained.

In the next chapter (chapter 4) the company being studied is presented together with information about the company's internationalization process.

In chapter 5 the findings are displayed taking into account the literature review analyzed before. In the conclusion section (chapter 6) a reflection about the insights gathered in this thesis takes place and final conclusions are withdrawn. Furthermore, some considerations about limitations of this research are addressed together with some research proposals for future work.

2. LITERATURE REVIEW

This chapter presents a literature review on what has been studied until now regarding the internationalization strategies of CPS firms. CPS firms are classified in terms of activity under International Standard Industrial Classification (ISIC) REV.4 classification for an understanding of the scope of activities of these type of firms. Moreover CPS firm`s unique characteristics were identified. The main part of this section regards the challenges and success factors of this type of firms in their internationalization process. These are identified by different authors in previous studies.

2.1 Definition of service firms and overview on construction Professional service (CPS) firms

Service firms are acquiring more and more importance in industrialized economies. Both inputs and outputs of service firms make them different from manufacturing firms but also lead to a differentiation over all the different types of service firms (Greenwood et al., 2005). In this section, the service sector is clarified and a detailed outlook on the specific service that I will focus throughout this thesis is provided.

2.1.1 Definition of service firms

Services have become a strong force in the today`s economy. It is a sector that is very heterogenic and presents intangible characteristics. Thereat it is very hard to classify service firms (Clegg, 1993). According to the World Trade Organization (WTO) General Agreement on Trade in Services (GATS) classification there are 12 service sectors:

1. Business services and professional services
2. Communication services
3. Construction and related services
4. Distribution services

5. Education services
6. Energy services
7. Environmental services
8. Financial services
9. Health and social services
10. Tourism services
11. Transport services
12. Movement of natural persons

As we can see, the portfolio of services is such that an analysis has to take place at a sectorial level. In this thesis I will focus on the first and third service sectors: professional and construction services.

2.1.2 Overview on construction professional service (CPS) firms

2.1.2.1 Overview of the sector

There are many definitions of construction services and the sector is “broadly comparable in international standard classifications” (Grosso et al., 2008, p.5). The WTO Sector-by-sector information describes Construction and related services sector as covering general construction work for buildings and civil engineering, installation and assembly work and building completion and finishing work (see WTO classification). In the ISIC Rev 4 this service comes under section F “construction” under division 43 “specialized construction activities” (ISIC, 2014⁵).

Even though construction firms come under one classification, their strategies, and portfolio of services offered are very different. Today’s trend of construction firms is for a more integrated service delivery: turnkey operations from design to construction and maintenance. Not only construction *per se* but also the project management activities related to construction. This consultant service comes under Professional services of the GAT services classification and under division 71 of ISIC Rev.4. In this division there is a group named “Architectural and engineering activities and related technical consultancy”. Construction

⁵ <https://unstats.un.org/unsd/cr/registry/regcst.asp?Cl=27>

services and engineering consultancy services are two types of services often confused but they are highly related and often complementary. For the purpose of this thesis I will define CPS firms as those firms included under categories 43 and 71 of ISIC Rev 4.

The construction sector is dominated by few large multinational firms and a large number of Small and medium-size companies (SME) specializing in certain fields (Cattaneo et al., 2010). The trend in construction sector is for a more consolidation of activities: a large firm, that englobes as many construction activities necessary for taking a project by itself according to construction industry reports (Grosso et al., 2008). The construction industry is important in today's economy as it creates new jobs opportunities, contributes to the economy's growth, and provides global solutions.

2.1.2.2 Characteristics

According to Grosso et al., 2008, the construction service industry presents unique characteristics:

- Labor-intensive sector (both skilled and un-skilled);
- Establishment abroad is often a necessity for trade to take place;
 - Requires local production
 - Short versus more permanent establishment
- Government procurement and public-private partnerships (PPPs) are important drivers of demand;
- Prone to corruption.

A key resource in the construction industry is the labor force, the first characteristic presented in the list above. Employees represent the knowledge, expertise and offer the competences necessary to the successful execution of the project (Lowendahl, 2005).

Another characteristic of the constructions service is that its activity requires local production, either in the local market or in the host market. This is due to the nature of the business where the whole production process must be exported and the output constructed in

the market where the project takes place (Grosso et al., 2008). This results in the establishment of the construction service abroad. The way they enter the host markets is then dependable on some factors and can result in a short term presence or a more permanent one. This decision between permanent and short-term entry will be discussed in the next sections of this paper (Grosso et al., 2008). With regard to the demand for construction service firms, this arises mostly from public (government procurement) or private parts (private partnerships). Lastly, a term that comes to the table regarding the construction industry is corruption. It is present in the construction industry more than in any other sector. An explanation for this fact is the size of the projects that allows for bribes and inflated claims.

2.2 Internationalization strategy of a CPS firm

In this section I will present a brief discussion on the internationalization of CPS firms. It is important to have an idea about the motivations and modes of entry in new markets of this type of firms to better understand the internationalization process of a CPS firm. Due to different characteristics described above, CPS firms present different motives for internationalizing and entry modes that differ from the well-known ones of manufacturing and even service firms in general.

2.2.1 Definition of internationalization

When firms go abroad, they engage in the internationalization process. This process has been defined by Susman (2007) as a result of an aggregated definition composed of different authors as:

“A process through which firms grow and develop internationally, establish and manage their foreign operations, increase their exposure to international business through international transactions, establish and develop relationships and networks that extend across borders which is manifested and identifiable through specific entry-modes, in location in relation to time”. (Susman, 2007, p.184)

This definition fits all kind of firms and at the same time opens the possibility for different ways firms engage in the process. The process is specific to each type of sector with unique characteristics that makes the process different between each sector and subsector of industries. With this in mind, it is logical that the process of internationalization in the service sector is different from the one experienced by the manufacturing sector (Jewell, 2010). In the following subsections I will focus on some of the stages of the internationalization process in more detail.

2.2.2 Drivers of internationalization of construction service firms

Why do firms internationalize? The answer to this question has different answers due to different reasons and motivations each single firm face.

Todo (2011) points out some drivers of internationalization of firms such as size, productivity, indebtedness and behavior of similar firms. Hollensen (2008) divides motives for internationalization in 2 groups: the proactive motive that initiate the entry into foreign markets (profit and growth objectives, managerial initiatives, technological competences, uniqueness of product, foreign market opportunities, market information, economies of scale, and tax benefits) and reactive motives, emerging from pressures in the domestic or in the foreign market, such as competitive pressure, small domestic market and lack of domestic demand, overproduction or excess capacity, unconsolidated foreign orders, possibility to extend sales of seasonal products, and proximity to international customers or psychological distance.

Later, Kubíčková et al., (2014) studied the relationship between size and motives proposed by Hollensen and proved that “the bigger the enterprise is, the more likely it will be driven to engage in internationalization by proactive motives at the expense of reactive motives.” (p. 328).

With specific regard to firms engaged in the construction sector, some authors presents specific motives (Jewell, 2010; Cicic et al., 1999; Majkgård and Sharma, 1998). One main driver is client following overseas - Service firms start the internationalization process by

either following existing clients to other markets building upon existence relationship. On the other hand, firms may also internationalize in search for new markets.

Gunhan and Arditi (2005) justify the search for new markets with giving 4 reasons: stagnant domestic markets (also supported by Jeweel, 2010), spreading risk through diversification into new markets, competitive use of resources, and taking advantage of the opportunities provided by the global economy.

2.2.3 Market entry strategy

Entry mode selection is a critical decision in international construction. The wide known ways to internationalize, proposed by Caves (1996) are: exportation licensing and franchising; strategic alliances and wholly owned foreign subsidiaries (increasing in risk from the first to the latter).

When focusing on internationalization of construction service firms, export is not feasible due to the nature of the service. Because the service requires local production, export of goods as we know does not exist. What is exported is the whole process and therefore entry modes need to be identified specifically for service firms.

The GATS of WTO, 2010, presents 4 modes of supply of service firms. Figure 1 sets out a table of modes by which service activities can be internationalized. In front of each mode there is a practical example from the perspective of an “importing” country A, as we can observe below:

Figure 1- Modes of Supply of service firms

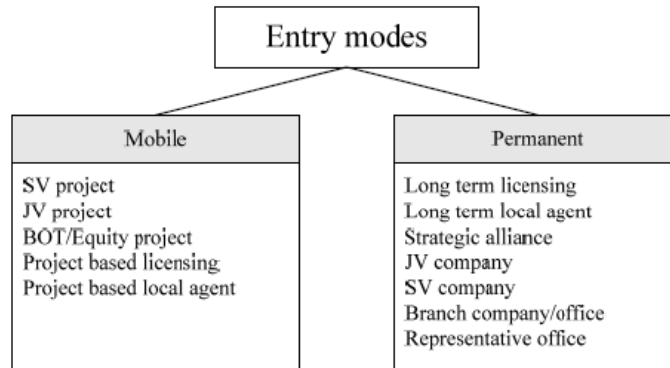
<p>Mode 1 - <u>Crossborder supply</u>:</p>	<p>A user in country A receives services from abroad through its telecommunications or postal infrastructure. Such supplies may include consultancy or market research reports, tele-medical advice, distance training, or architectural drawings</p>
<p>Mode 2 - Consumption abroad</p>	<p>Nationals of A have moved abroad as tourists, students, or patients to consume the respective services</p>
<p>Mode 3 - Commercial presence</p>	<p>The service is provided within A by a locally-established affiliate, subsidiary, or representative office of a foreign-owned and — controlled company (bank, hotel group, construction company, etc.).</p>
<p>Mode 4 - Movement of natural persons</p>	<p>A foreign national provides a service within A as an independent supplier (e.g., consultant, health worker) or employee of a service supplier (e.g. consultancy firm, hospital, construction company).</p>

Source: WTO⁶, 2017

As we can see, construction services are mostly provided by the two latter, as it was expected, due to the characteristics of construction services that requires the work to be carried out in the host market. Inside the broad supply modes 3 and 4, mostly used by construction services, Chen and Messner propose ten specific entry modes for international construction (Chen and Messner, 2011): Strategic alliances; build-operate–transfer/equity project; Joint Venture (JV) project; representative office; licensing; local agent; JV company; Sole Venture SV company; branch office/company and SV. These modes are aggregated in two entry groups: permanent entry and project specific/ mobile entry (Chen, 2005) - see figure 2.

⁶ https://www.wto.org/english/tratop_e/serv_e/cbt_course_e/c1s3p1_e.htm

Figure 2- Grouping Entry Modes Regarding Mobile v. Permanent



Source: Chen, 2005

In a permanent entry, the entrant has equity in a permanent organization (i.e. a sole venture company, joint venture company, branch office/company or representative office) with strategic commitment for a long-term local business development in the host market. In a mobile entry, the entrant will suspend his support activities, lay off local employees and exit the market. Permanent entry mode needs more resources, requires more investment and involves more risk, and is less flexible than mobile entry (Chen, 2005).

In a later study, Chen (2008) studied the factors influencing the entry modes of construction services and found out that permanent entry mode is chosen over project specific if the factors: cultural distance, competitive intensities are significant or if language proximity, entry restrictions or colonial ties are non-significant.

Regarding this dichotomy of permanent entry versus mobile entry, Cattaneo et al (2010) state that the trend of entry strategy has been towards a permanent presence in the client market instead of a project specific/mobile presence alternative.

2.3 Challenges of internationalization of a CPS firm

“The global construction market is large, expanding, fragmented, regionally fluctuating, heterogynous, risky, and highly competitive”

(Chen and Messner, 2009, p.3).

This statement introduces us to the complexity of the construction industry in an international environment. In this section the research made until today regarding the problems and challenges that arise with internationalization is presented. Problems faced by firms in general, and then more specific to the CS firms. After identifying all challenges, I will focus on the ones faced when a firm internationalizes to a mature market.

2.3.1. Challenges faced by the internationalization of firms

The problems arising in internationalization have been studied by many authors. Hymer (1979) analyzed the unfamiliarity with the foreign market with the “cost of doing business abroad” (CODBA)) model and Zaheer (1995) introduced the concept “liability of foreignness” (LOF).

CODBA is a concept that refers to the extra costs a firm takes on when internationalizing. Zaheer (1995) took on this idea and introduced a second concept: LOF. The author explains that this concept arises from 4 sources:

“(1) costs directly associated with spatial distance, such as the costs of travel, transportation, and coordination over distance and across time zones; (2) firm-specific costs based on a particular company's unfamiliarity with and lack of roots in a local environment; (3) costs resulting from the host country environment, such as the lack of legitimacy of foreign firms and economic nationalism; (4) costs from the home country environment, such as the restrictions on high-technology sales to certain countries imposed on U.S.-owned MNEs.”
(Zaheer, 1995, p.343).

These costs and the strategies used to overcome them are of relative importance depending on the sector and firm (Zaheer, 1995). For this reason, in the next subsection, it is presented the ones that are of high importance to construction service firms and extra ones that are specific to the sector.

2.3.2. Challenges from the internationalization of CPS firms

2.3.2.1 Reputation

Reputation is a barrier in the internationalization of the firm which is linked to the concept LOF described above and was found to affect CPS firms.

In his paper, Proverbs analyzed 18 problems of the construction industry raised from extended literature review and findings show that poor image and reputation was ranked the main challenge to overcome (Proverbs et al., 2000). Reputation (either in terms of country of origin or the firm itself, or both) is considered a key factor in the face of contractor uncertainty.

2.3.2.2 Foreign country disadvantage

Foreign country disadvantage is a challenge faced by CPS firms, linked again to the LOF. Due to the local nature of the construction business, home-country firms show competitive advantages over foreign contractors in terms of: language; knowledge of appropriate methods and procedures considering cultures; knowledge of laws; regulations, policies and administrative system; established client base and track record; political and economic policy which may offer preferences; and existing networks of strategic allies, suppliers and subcontractors (Ofori, 2003).

2.3.2.3 Political and economic instability

Being that CPS firms establish themselves in the selected home country, given the nature of its activity it is natural that risks and problems arise from the regulatory, political and

economic environment of the country of destination. Hence, Kapila and Hendrickson (2001) present some problems that arise from the internationalization of which includes: political instability (ambiguous policies, changes in law and regulations, restriction on fund repatriations and import), currency restrictions and economic and financial instability that may include drastic variations in inflation or currency rates (Wang et al., 1999).

2.3.2.4. Human resources

In the construction and related services high skilled labor is crucial namely- skilled craft workers and technicians. Construction relies deeply on labor with high developed manual skills. Indeed, the construction sector is dealing with levels of skill shortages because it is difficult to recruit workers due to unavailability and lack of skills of the workmanship (Holt et al., 2000).

Poor workmanship was identified by Proverbs (2000) as one of the problems faced by the industry. Construction firms have to find a way to deal with these shortages of low-skilled or unskilled workers.

2.3.2.5. Technical restrictions

Regarding some technical restrictions, UNCTAD report⁷ (2000) focuses on regulation and liberalization in the construction services sector. Difficulties in access to financial resources, qualification procedures, technical standards and licensing requirements restrictions on the movement of persons were the many challenges presented in promoting growth in the construction sector. Restrictions on labor movement can turn out problematic, mostly when firms decide to participate in international projects in a temporary manner without permanently establishing offices in the host country. These regulations have to do with the area of labor market regulations and immigration policy of each market. Even if the workers pass the restrictions barriers, it can turn out to be a time consuming process that can threaten the project execution plan (Engman, 2010).

There are additional restrictions on commercial presence, on the opening of subsidiaries and operation by foreign companies (WTO, 1998). It is possible that a country regulates on the

⁷ <http://unctad.org/EN/docs/c1em12d2.EN.pdf>

form of entry, requiring foreign firms to form a joint venture with national firms, due to national interest. Besides limitations on the access, more limitations arise with regard to foreign firm`s presence: registration requirements, authorization requirements, performance requirements, and technology transfer requirements; licensing, standards and qualifications; and nationality and residency requirements. They impact the operational flexibility as well as the possibility for making profits and repatriating the earnings to the mother firm, (Engman, 2010).

Figure 3- Number of measures in construction and related engineering services

	Crossborder supply	Consumption abroad	Commercial presence	Presence of natural persons
Market Access				
Limitations on				
Number of suppliers	1	—	5	—
Value of transactions or assets	—	—	11	—
Number of operations	—	—	—	—
Number of natural persons	—	—	—	11
Types of legal entity	—	—	26	—
Participation of foreign capital	—	—	16	—
Other measures n.e.c.	8	3	28	32
National Treatment				
Tax measures, subsidies, and grants	—	—	—	9
Nationality and residency requirements	—	—	12	14
Licensing, standards, and qualifications	—	3	7	39
Registration requirements	—	3	7	3
Authorization requirements	4	—	5	5
Performance requirements	—	3	3	3
Technology transfer requirements	—	—	1	—
Other	5	—	8	6

Source: Secretariat, WTO, 1998

The table above shows the amount of measures related to market access and national treatment per mode of supply. We can see that commercial presence and natural persons are the main target modes of supply for restrictions. These modes as indicated in section 2.2, as mode 3 and 4, are most used by a construction service firm.

2.3.3 Summary of challenges in the literature

The table below (table 1) presents a summary of the most frequently cited challenges retrieved from the literature. For the purpose of brevity, the challenges are grouped in 2 general headings -challenges faced by firms in general and challenges faced by CPS firms- and within 5 sub-headings: Reputation, foreign country disadvantage, political and economic instability, human resources and technical restrictions.

Table 1- Summary of the Challenges faced by CPS firms

	<i>Challenges</i>	<i>Studies</i>
General	Liability of foreignness	Zaheer, 1995
	Reputation	
	Poor image and Reputation	Proverbs et al., 2000
	Foreign country disadvantage	
	Home country advantage over foreign firms	Ofori, 2003
	Political and economic instability	
	Political instability	Kapila and Hendrickson, 2001
	Currency restrictions	Kapila and Hendrickson, 2001
	Economic and financial instability	Wang et al., 1999
	CPS firms	Human resources
Poor workmanship		Proverbs, 2000
Technical restrictions		
Difficulties in access to financial resources		UNCTAD report 2000
Qualification procedures		UNCTAD report 2000
Technical standards		UNCTAD report 2000
Licensing requirements		UNCTAD report 2000
restrictions on the movement of persons		
Registration requirements		Engman, 2010
Authorization requirements		Engman, 2010

Performance requirements	Engman, 2010
Technology transfer requirements	Engman, 2010
Licensing, standards and qualifications	Engman, 2010
Nationality and residency requirements	Engman, 2010

Source: Author

2.4 Strategies to overcome the challenges

Today's global landscape has introduced various challenges for construction companies. But it also offers numerous opportunities for these firms to favorably position themselves in today's competitive environment. Internationalized CPS firms need to rapidly and efficiently adapt to be able to compete with existent and increasing powerful players and to increase their performance in the market.

2.4.1. Success factors

It is important to notice that until today there is no "suitable framework for analyzing the factors that influence success in international construction", (Ofori, 2003, p.388). However, I aggregate in this section specific success factors that different authors point out as indispensable for the success of a construction firm. The term "Critical Success Factors" (CSFs) is referred by Yong and Mustaffa (2013) as "a number of 'truly' important matters on which industries should focus their limited resources in order to achieve success" (p.961).

2.4.1.1 *Competitive advantages*

To overcome the LOF the author Zaheer (1995) proposes a strategy: firm-specific advantages (FSAs). These advantages may come from economies of scale and scope, brand name, a differentiation in product, organizational and managerial capabilities or skilled labor. These

unique skills allow firms to have competitive advantage and hence stay ahead of competition in international markets. Superior advantages may also arise from Country-specific advantages (CSAs) or location advantages. These are advantages related to the environment of the country and respective factor endowments such as labor costs, transportation costs, government regulation and natural resources, for example. CSAs can come either from the home country or host country (Rugman and Verbeke, 1992; Dunning, 1980).

2.4.1.2. Qualifications

The performance of CS firms in some aspects of the business is crucial for determining the success of the firm. A good track record is a trust and an important indicator of a firm's trustworthiness and capability (Wong et al., 2008).

2.4.1.3. Human Resources

Employees of a CPS firm play an important role in the success of a project being that this type of firms rely almost 100% upon human capital (Jewell, 2010). From top management to technicians on the field, together they guarantee the performance or failure of the firm. It is important to achieve a good performance in terms of the competency of the team and capability of key personnel to create a very skilled efficient labor force (Ng and Tang, 2010). To effectively manage the internationalization of CPS firms, the localization strategy has been proposed by Ling et al., (2005) as an effective strategy to be implemented by CPS firms. The term localization refers to the adoption of practices to adapt for the host environment. In this thesis I am referring to the "localization" of human resources: which refers to "the process of displacing expatriate managers with local talent" (Fryxell et al., 2004, p.269). The authors suggest that localization can lead to a reduction in the operating costs and prompt a successful internationalization.

Another strategy, proposed by Ling et al. (2008) is the engagement of subcontractors in the host country which leads to the competitiveness of the firm.

2.4.1.4. Partnerships

As I mentioned above in the internationalization process, there are different entry modes for a construction organization: Mergers and Acquisitions (M&A), JV Strategic partnership Licensing, franchising, technology transfer or SV subsidiary. These forms of entry are considered a crucial strategy to mitigate risk. This ability to form alliances is important for this kind of industry that depends a lot on reputation. Furthermore, partnerships will allow the firm to gain local knowledge and access to the partner's network base (Jewell, 2010; Jewell et al., 2014).

2.4.1.5. Flexibility

Lim et al. (2010) propose organizational flexibility as a form of competitive advantage. The authors believe that this feature will enable construction firms to adapt their processes to better respond to environmental changes. The determinants he believed contributes to flexibility are: imbuing employees with shared vision and value; having senior management who are open-minded; equipping employees with appropriate skills and behavior; having superior supply chain, cost management, and risk management, capabilities; and developing customer intimacy. These strategies are believed to help firms grow and become more efficient. Flexibility is also studied by Shahu et al. (2012) as a critical source of success in construction projects, leading to risk reduction and as a result increasing the probability of success of the project.

2.4.1.6. Innovation

The use of Information and communication technologies (ICT) () offers opportunities by introducing new ways of interaction in international trade, construction process and monitoring of materials. An open communication platform could open doors for high participation of various parties such as customers, subcontractors, architects and designers (European Foundation for the Improvement of Living and Working Conditions, 2005).

Innovation of products and processes is considered mandatory to stay ahead of competition. Construction companies need to innovate to create competitive advantage and to support the

trendy sustainable development (European Foundation for the Improvement of Living and Working Conditions, 2005).

2.4.2. Summary of success factors in the literature

Following the same structure as the previous sector, the table below (table 2) presents also a summary of the most frequently cited success factors retrieved from the literature. For the purpose of brevity, the success factors are grouped in 6 general headings for this thesis.

Table 2 - Summary of success factors of CPS firms

	<i>Success factors</i>	<i>Authors</i>
Competitive advantages	FSA CSA	Dunning 1980 Dunning, 1980
Qualifications	Performance in terms of track record	Wong et al., 2008
Human resources	Competency of the team	Ng and Tang, 2010
	Capability of key personnel	Ng and Tang, 2010
	Localization strategy	Ling et al., 2005
	Subcontractors in the host country	Ling et al. 2008
Partnerships	Ability to form alliances	Jewell, 2010; Jewell et al., 2014
Flexibility	Organizational flexibility	Lim et al., 2010 and Shahu et al., 2012
Innovation	Use of ICT	European Foundation for the Improvement of Living and Working Conditions, 2005
	Innovation of products and processes	European Foundation for the Improvement of Living and Working Conditions, 2005

Source: Author

2.5 Overcoming Challenges in a mature market

Until this section, the discussion was on overcoming challenges in the process of internationalization. Yet, the focus of this thesis is to understand this situation in the European mature market. For this reason, this section will discuss the existing literature on this topic in a mature market context.

2.5.1 Gap in the literature

In the previous section the challenges and success factors regarding the internationalization of CPS firms were addressed. However, there is no distinction between the challenges faced in different economies (developed vs undeveloped). Some challenges arise from the internationalization to emerging countries whereas some may arise from the internationalization to a mature market.

Previous literature focused on the challenges faced by CPS firms when entering emerging countries and on the challenges faced by a firm from an emerging country (Amal et al., 2013). However there is a gap in a literature regarding the specific challenges faced when a firm internationalizes to a developed/mature market. The focus these days is on the internationalization to emerging countries.

2.5.2. Challenges in Developed markets

The barriers a firm may encounter when entering a mature developed country should differ from the ones faced when entering as emerging country as these markets present differences in their nature. They differ in norms, resources and infrastructures and hence different challenges are expected from these two different markets (Hitt et al., 2000).

Barriers such as lack of infrastructure are more likely to occur in undeveloped markets than in developed ones, for example. Also, advanced markets have effective contract enforcing mechanisms, skilled intermediaries and legal systems compared to less developed economies (Khanna et al., 2005). It is reasonable to say that mature economies don't suffer from the

same problems as undeveloped economies as the latter deals with problems related with the general socio-economic-stress in this market, lack of resources and institutional weakness (Ofori, 2000).

In a mature economy like the European Union, on the other hand, we witness a more open market with clear legal framework and the almost nonexistent barriers to trade⁸ (The European construction sector brochure, 2016).

Even though a mature market can offer some stability, there are a number of challenges when entering one. They already assessed the preferred providers in the industry and selected their trust ones. In a mature market where the competition is intense and there is a feel of a network environment, local know-how and specialized connections are challenges faced by new entrants (McQuillan et al., 2013).

Given the limited theory and empirical evidence about how CPS firms overcome challenges in mature markets, in the next section I use qualitative methodology building through a case study.

⁸ http://ec.europa.eu/growth/sectors/construction/index_en.htm

3. METHODOLOGY

To investigate the challenges and strategies of success in the internationalization of CPS firms, this study exploits a case study of an engineering CPS firm. Data was gathered from primarily interviews, archival analysis and reports. In a next step, this data will be analyzed using the “coding” method and relevant challenges and success factors in the expansion process of the CPS firms will be identified.

3.1 Research method

In this subsection I will be addressing the suitability of the research method used as well as justifying the choice of the company for the purpose of this thesis.

3.1.1. The case study methodology

The methodology being used to address the research questions of this paper is qualitative. Cheng (2007) pointed out the importance of qualitative research for surfacing contextual dimensions in International Business. The reality of context is difficult to specify without having been experienced. Hence, since I want to understand the challenges faced by a CPS firm in the western European markets, qualitative research is a good fit and contributes to a better understanding of the theory in these markets.

In this thesis I will use the case study methodology which refers to the in depth analysis of particular case. Case study approach is considered to be appropriate to use in research that addresses “how questions” (Yin, 2003). Because one of the questions I want to answer is “how to overcome the challenges faced by CPS firms in a mature market”, this technique seems very suitable.

This method serves as an instrument that enables a clear understanding of a complex topic as it addresses it contextually and in a detailed way (Stake, 1995). It is appropriate in investigating the complex phenomenon of this paper that is the internationalization, especially of CPS firms because of their specific features.

Furthermore, this method allows for a generalization and expansion of the theory as it adds real empirical insights to the existing literature and knowledge (Yin, 2003).

Contrary to the use of surveys, the case study method can provide more accurate knowledge for the understanding of the internationalization of CPS firms. One of the reasons is due to the use of interviews that allows for the extraction of more information as it uses open ended questions where the interviewer can add on the question to understand in more detail something that is not clear (Vissak, 2010).

The case study allows for theory generation (Johnston et al., 1999) by understanding patterns, replicating or confirming what has been studied until now. On the other hand, one critique to this type of research concerns the generalization of findings and the generation of a representative sample. However the goal of the qualitative research is to produce analytical and not statistical generalizations (Yin, 2013). It is supposed to provide particularistic and contextual results. In the particular case of Proef Group, the firm is studied to understand this specific case, not others (Stake, 1995).

3.1.2. The company

Proef Group was the firm chosen as the case study for this paper, for better answer the research question for several reasons.

Firstly, the topic of this paper concerns a CPS firm. Proef Group is in fact an engineering firm that offers construction and professional services in the area of telecommunications and energy.

Secondly, we are talking about the internationalization process. Proef group, besides being elected one of the most internationalized firms in Portugal (15th place) it is also present in more than 11 countries around the world.

Furthermore, the internationalization process of the company wasn't easy and a lot of obstacles regarding the western European markets emerged along the way. However Proef has proved to be capable of overcoming those challenges and valuable insights can be retrieved to serve as example for many Portuguese CPS firms when dealing with internationalization to similar markets.

3.2. Data collection

In the present subsection, I will be presenting the sources of data used in this thesis, how these were collected and a description of the process will be detailed.

The data used in this case study was extracted from different sources (See Table 7 for a detailed outlook on the sources used in the data collection):

- Archival records;
- Firm`s internal documentation;
- Interviews with 3 key informants of the firm involved in the internationalization process.

The first two sources are considered secondary data where the later refers to primary data. Secondary data refers to data that is not collected by the investigator but he/she uses it for a specific purpose. Primary data refers to data collected by the investigator himself for a specific purpose. The primary data includes case studies, survey data, focus groups, participant observation data whereas the secondary data can be various, from company records to government sources. The decision to collect two types of data on the same topic - data source triangulation- was important in order to ensure validity (Denzin, 1978).

The first source of information was retrieved from archival records on the internationalization of CPS firms, the challenges faced and strategies to overcome those.

The case study also draws on the scrutiny of documentation, provided by the firm before interviews, for an understanding on the case history of the company and its internationalization process.

The next step on data collection comprised the 4 guided /semi-structured interviews with 3 key informants of the firm. The first interviewee was the Strategy and Management Control Manager followed by an interview with the Chief Operating Officer (COO) Europa of the company and the Deputy Chief Executive Officer (CEO) – see table below for a description of the interviewees. The interviews lasted in average 1 hour and started with general questions to understand the organization itself, the structure and the firm today`s situation. During the interviews the focus was on some core topics: firm organization structure, firm internationalization process, challenges, strategy to overcome challenges and future strategy

of the firm. It followed by open-ended questions where the participant was able to express a fresh perspective and experience.

Table 3 - Interviewers description

	<i>Name</i>	<i>Position</i>	<i>Date</i>	<i>Duration</i>
Interviewer 1	Hélder Longras	Strategy and Management Control	15.03.2017	54 minutes
		Manager	26.04.2017	1 hour 30 minutes
Interviewer 2	Alfredo Ferreira	COO Europa	17.05.2017	50 minutes
Interviewer 3	Luis Andrade	Deputy CEO	22.05.2017	1 hour

Source: Author

3.3. Data Analysis

For the analysis of the data which was being done since and alongside the data collection phase the method used in this thesis is coding.

The codes are derived from the data and taking also into account the initial research question and sub research questions. Based on the frameworks proposed by the authors mentioned above, I categorized the data identifying the challenges faced by the company in the internationalization and in a last step I coded the strategies used to face the specific challenges. The classification of the data will help me answer the research question.

I followed the stages of qualitative data analysis proposed by Miles and Huberman (1994). Firstly I read throughout all the data and the statements related to my research question were organized under a specific code/category (open coding).

In the example below I use 2 quotations from interviewer 1 but the method was applied to the other interviewers and documents in the same manner.

Table 4 - Part of the coding table

<i>Interviewer</i>	<i>Representative Quotations</i>	<i>Code</i>
	<p>“First strategy was to send employees from Portugal to Europe. Because we have cheap labor costs with Portugal employees it gives us a competitive advantage in relation to the rest of western Europe.”</p>	<p>Employees from Portugal</p>
Interviewer 1	<p>“In the project management level it is important to have local employees to facilitate the penetration in the market with knowledge about local clients, about the market and competitors.”</p> <p>“We are currently changing our strategy by starting to hire local employees from the director management level with local knowledge.”</p>	<p>Local employees</p>

Source: Author

Secondly, I reread the data, searched for statements that could fit the ones created in the first phase and added new ones (axial coding).

4. CASE STUDY

In this section, the company selected for this Thesis will be described in terms of structure as well as the internationalization process that it has taken until now. The information was retrieved using face-to-face interviews as well as the firm well-organized website for a clear understanding of key figures, business parts of the company and how the group operates. Special attention will be given to the internationalization process suffered by the firm until now, with an understanding on the challenges faced and the strategies to overcome them.

4.1 Overview of the company

PROEF Group operates in the area of engineering infrastructures where it focuses on developing solutions in the areas of energy, telecommunications and renewable energy. The aim of the group is to deliver high-end and integrated solutions to its customers by covering the value chain (design, building and maintenance of the projects).

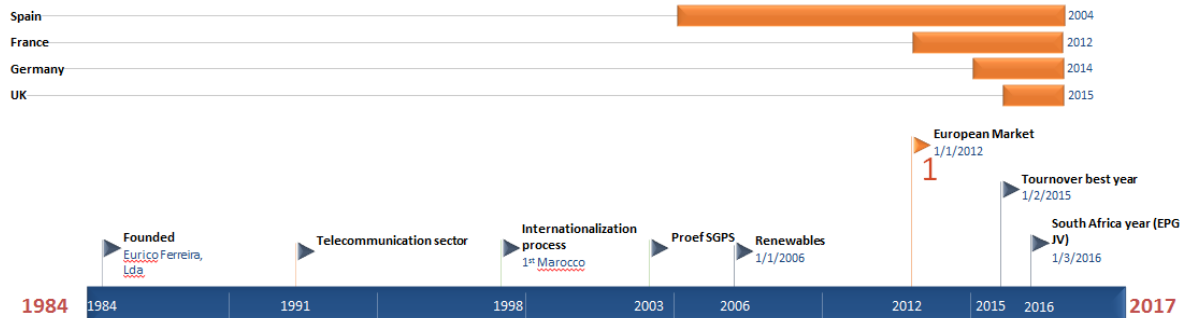
It was in 1984 that Proef Group started as Eurico Ferreira in Trofa, Portugal. Eurico Ferreira was first established as a firm operating, in a first phase, in the energy sector being the main activity electrical installations. The decade of 90 was marked by various contracts with big energy firms, such as EDP (Eletricidade de Portugal) and by the expansion of services to the telecommunication sector. In this sector, the firm started its activity from mobile networks to TV by cable and optic fiber in 2004. Today the firm operates in fixed, mobile, core and next generation networks. In 1998 Eurico Ferreira started its internationalization process, giving place to Proef Group in 2003 as we witness today, embracing also the Renewable Energy sector. – see figure 4 for a review on the important marks of the firm. The group creation allowed for a more integrated and diversified portfolio and at the same time to take advantages of the synergies between the different, but complementary, areas of business.

Today the group integrates more than 25 companies with 1500 employees in 11 different countries. Ambition, leadership and innovation are the values incorporated in the firm's strategy and in the relationships with their clients. The firm achieved 195 million euros turnover in 2016, and is expected to grow in years to come - see figure 10 and 11 in the

appendix for an overview of the evolution of the consolidated and aggregated turnover of the firm, respectively.

Eurico Ferreira was the first engineering firm in Portugal to obtain the certificate of social responsibility. Also, the firm is 100% online and has implemented some innovative tools internally such as Selfnet program, a European project that aims the development of automated tools for a better performance of networks in a 5G context.

Figure 4 - Important marks in the firm`s history



Source: Author

4.1.2 The Business

The PROEF Group integrates a portfolio of 4 business areas that enables a diversified offer and efficient internal synergies captured through the different areas- see figure 13:

- **PROEF Engineering** – is the focus of this thesis and described in detail later on.
- **PROEF Renewables** offers integrated solutions in the areas of design, construction, operation and maintenance of renewables energies, such as photovoltaic energy.

- **PROEF Partners**, operates in complementary activities of the core business adding value and deepen the partnerships closely with the clients.
- **PROEF Industries & Services** operates with solar panels and machining of parts using “cnc” technology.

These four areas of business operate in 2 sectors: telecommunication and the energy sector. Activities of the energy sector includes electrical installations, network and electricity supply of different levels of voltage, safety of the buildings. The latter sector focuses on fixed mobile, core and next generation networks.

For this thesis I will focus on the area of Proef Engineering. This area of business is considered the core of the firm. Its activity is directed to the development of global solutions in the area of energy and telecommunications. It requires know-how and technique capabilities, that covers all firms of Proef engineering. This area counts with big operators and distributors of telecommunications and energy in the countries where is present. Proef engineering is composed by every company of the group that directly or indirectly plays a role in the engineering and infrastructure sector- see Figure 10:

- Eurico Ferreira Portugal
- Proef France
- EF Deutschland
- Eurico Ferreira Angola
- Proef Energias de Angola
- Eurico Ferreira Mozambique
- Eurico Ferreira South Africa
- EF Power South Africa
- Proef East Africa

A common trace to all areas for the business is the training and the consulting part of the business that provides integrated solutions to its clients. The business has the concept “innovation” always alive, trying to always adapt to the changing environment of the market and in every area of the business.

4.2 Internationalization Process

PROEF Group operates today in big international markets: Europe, Africa, and Latin America.

It is important to highlight that Proef Group ranked 19th in the Internationalization Ranking of Portuguese Companies⁹ in 2016¹⁰ and 15th place in 2015¹¹ which shows the strong position of the company in the internationalization world - see figure 12 for a list of companies present in the ranking.

It all started in 1998, a memorable year, where the firm set out to conquer international markets. The firm started by targeting Morocco and Brazil as the first countries in which the firm ventured. In 2004 the firm expanded to the African market with Eurico Ferreira Angola as the emerging countries were starting to gain visibility.

One year later, the group started its presence in Spain and in 2012 to reinforce its presence in the European market, it created Proef France.

Currently the firm is present in 11 countries and aims to keep expanding in a near future. The firm has engaged in a path of sustainable international growth, looking for adequate partners for a better success in different cultures.

The plans for 2020 will be to solidify the presence in existing markets, and grow organically. The firm will invest in M&A and partnerships (not yet taken in Europe) to achieve a sustainable growth in the future and stronger its dimension- see figure 12

4.2.1 Internationalization to European markets

In Europe Proef is present in 5 countries: Portugal, Spain, Germany, UK (2015) and France (2012). In Spain the firm is doing renewable engineering and in the UK the presence is still really recent. Hence, I will focus my analysis in Germany and France and the core business of the group: the Telecommunication area. In this area, Proef Engineering is able to provide

⁹ Result of the 3rd Edition of the Internationalization Ranking of Portuguese Companies (RIEP) by INDEG-IUL ISCTE Executive Educac.

¹⁰ <http://iddesign.ipapercms.dk/INDEGISCTE/Brochuras2016/riep2016-indeg-iscte/>

¹¹ http://iddesign.ipapercms.dk/INDEGISCTE/AnoLetivo2015_16/RIEP/INDEGIULRIEP2015/

turnkey model projects- It starts with the design stage, followed by construction and the maintenance of the infrastructure. Proef specializes in a portfolio of innovative solutions: Mobile and fixed networks - see figure 15 for a detail on the portfolio of services in the telecommunication area.

The Group describes the European market for this sector as a very protectionist and high competitive market with multiple service suppliers. In the European market it is possible to encounter in average 3/4 big clients for the telecommunication projects in each country each of them with various suppliers. Luis Andrade (2017) adds that: "In Europe there is a big market opportunity in the area of Telecommunications specifically in the mobile network and fixed network". Within the mobile network, in Germany and France, it is possible to encounter many places without 3G network while in Portugal the country is almost all covered in 4G network. In the area of fixed network, the penetration of Fiber To The Home (FTTH) is around 5 % whereas in Portugal this number is around 30%- see figure 7 and 8. In Portugal the form of broadband access is in major part optical fiber whereas in Germany and France the form of access is very much still through Asymmetric Digital Subscriber Line (ADSL).

In Europe, Proef is currently working on achieving specific goals for 2020. "Deep dive Business Development Europa" is an operational plan with the consultancy of Delloite group, which includes a series of initiatives: reach certain market shares, entry in new clients, betting on new services and establishment of new operational partnerships that allow for efficiency optimization of the operations in every single market (UK, Germany and France).

5. FINDINGS

In this section, the research question will be answered by understanding the challenges faced by Proef Group in their expansion process to Europe and attribute the specific strategies used to overcome each barrier. After the analysis of the interviews and the above section of the case study, in this finding section I investigate whether there is a match between the challenges of the literature and those of Proef firm.

5.1. Internationalization process

The strategy of Proef Group starts with going to the country of destination and engaging in a market research and a business development action. The firm looks for the big private telecommunication operators and present themselves to them. They then try to qualify themselves next to the potential client by fulfilling specific criteria that are requested and doing pilot projects to prove the firm's quality and efficiency. After gathering all the qualification requested by the client, the client decides whether to put Proef in the suppliers list. Once this happens, if a project comes up, the client will send out a RFI (Request for Information) for their list of suppliers. The selection of the supplier will be decided based on specific criteria of the client (normally a mix between low price and quality). If Proef gets chosen for a first project, a specialized team will move to the country of destination to take on the project and due to the nature of the group's activity, the firm maintains an active presence in the countries it operates. Proef Group operates in the second line indirectly with telecommunication operators and directly with the big suppliers. Luis Andrade (2017) states:

“We don't work directly with big operators like Orange in France, but with the big suppliers such as Ericson, Nokia, Huawei, for example.”

Discussion

The internationalization process of a CPS firm starts with the urge of conquering new markets or by following client overseas (Jeweell, 2010). However the latter is not the case of Proef Group. For example, if Proef works for Vodafone in Portugal and then Vodafone decides to open a subsidiary in Germany, it does not mean that Proef will have Vodafone as a client in Germany guaranteed. Manager Helder Longras (2017) claims that “The management of Vodafone in Germany is different from the one in Portugal, so it doesn’t guarantee a job as a supplier in Germany”.

Nevertheless, the client of Vodafone in Portugal can serve as a help to build the reputation track of a firm. Manager Hélder Longras (2017) states:

“If we go to Vodafone in Germany and we say that we already worked with Vodafone in Portugal, it can be a plus in our reputation”.

With respect to the choice of going to Europe, this was made due to the fact that “it is a market where there is prospect of growth and market opportunity in the telecommunication area, however a firm can only grow until a certain point in this mature markets” (Alfredo Ferreira, 2017).

Regarding the entry mode to the European market, the literature refers to 2 of the 4 modes of supply of service firms: commercial presence (mode 3) and movement of natural people (mode 4), (GATS of WTO¹²). In the case of Proef Group, the firm engages in mode 4 in a first phase – when it performs the business development in a new country and performs pilot projects proposed by the client. When the firm finds potential clients and a project comes up, the firm engages in mode 3 (commercial presence) by going to the country and maintaining a physical presence in this new country with a complete team ranging from technicians to Project Managers.

¹² https://www.wto.org/english/tratop_e/serv_e/cbt_course_e/c1s3p1_e.htm

5.2 Barriers faced by Proef when internationalizing to western European markets and respective strategy

Table 5 - Literature vs findings

Challenges proposed by researchers	Challenges faced by Proef Group
Liability of foreignness	✓
Reputation and poor image	✓
Home country advantage over foreign firms	✓
Political instability	×
Currency restrictions	×
Economic and financial instability	×
Poor workmanship	✓
Difficulties in access to financial resources	×
Qualification procedures	×
Technical standards	×
Licensing requirements restrictions on the movement of persons	×
Nationality and residency requirements	×
Authorization requirements	×
Performance requirements	×
Registration requirements	×
Technology transfer requirements	×
Licensing, standards and qualifications	×

✓ : Challenges faced by Proef Group
 × : Challenges not faced by Proef Group

Source: Author

When looking at the table above (table 5) that summarizes the challenges and success factors encountered in previous literature, we can see that Proef Group does not face all of them in their internationalization to Europe.

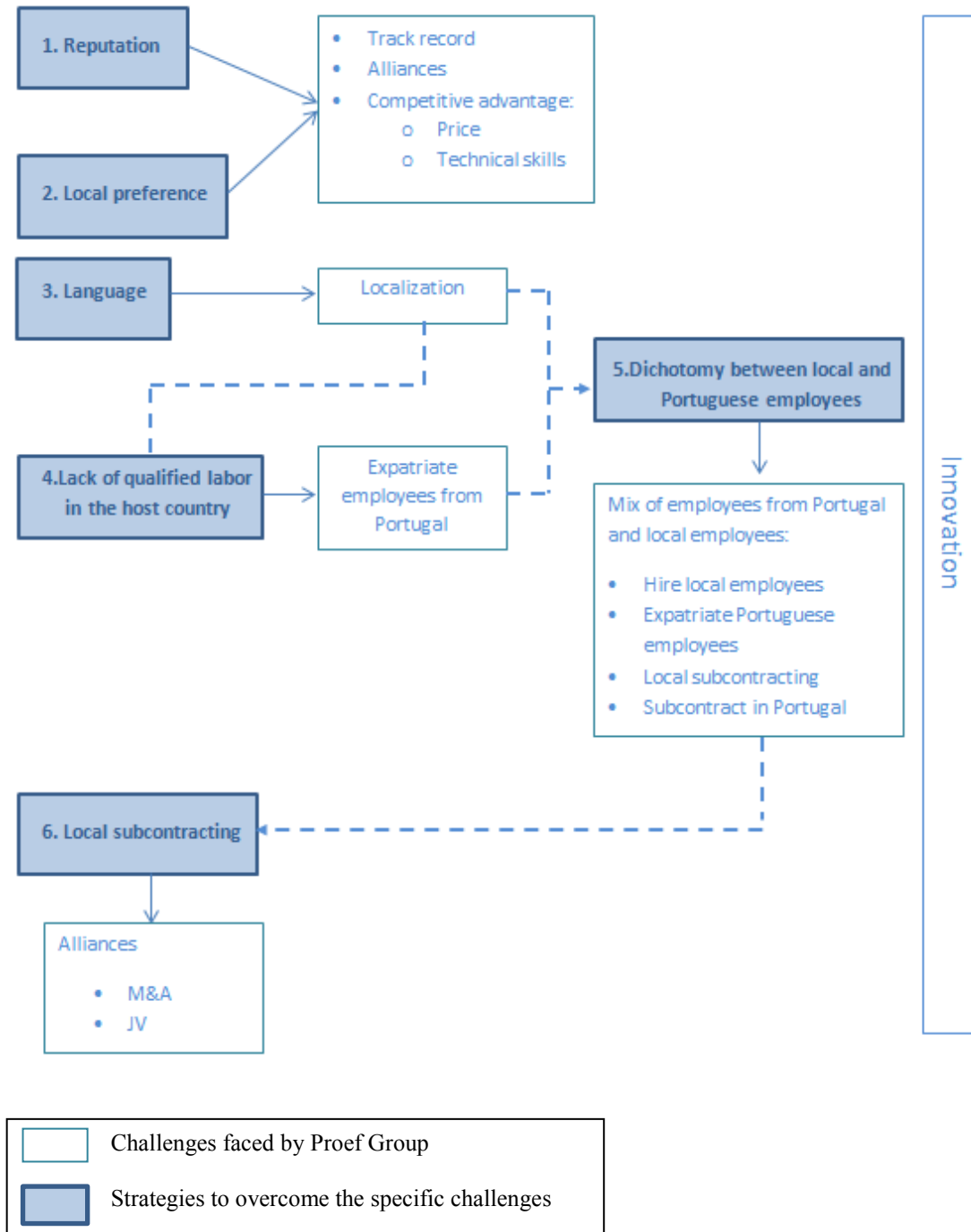
The following barriers are not faced by Proef Group: (i) Political, (ii) Economic and financial instability, (iii) Currency restrictions, (iv) Difficulties in access to financial resources, (v) Qualification procedures, (vi) Technical standards, (vii) Licensing requirements restrictions on the movement of persons, (viii) Nationality and residency requirements, (ix)

Authorization requirements, (x) Performance requirements, (xi) Registration requirements, (xii) Technology transfer requirements and Licensing, standards and qualifications.

Discussion

Regarding the first 2 barriers, of the above mentioned ones, these are more commonly found in emerging countries where this instability is very common. The other barriers are not faced by Proef Group as it is a Portuguese firm and hence it belongs to the European Union where there are little or no restrictions to trade within European countries belonging to EU.

Figure 5 - Scheme of the findings – 6 Challenges and specific strategies



Source: Author

5.2.1 Reputation

“Reputation is the major problem Proef faces in their internationalization to Europe”, stated the Manager Helder Longras (2017). The hardest part is to be well known among the telecommunications operators. Reputation (either in terms of country of origin or the firm itself, or both) is a key factor in the face of a client uncertainty between suppliers.

The reputation problem for Proef is “not related to technical quality and knowledge but more about our dimension compared with big suppliers in Europe” (Alfredo Ferreira, 2017). Proef is seen as new and little compared to giant and stablished suppliers in the European market. In France for example, the CEO Deputy Luis Andrade says that “all suppliers of Orange operator presents turnover in billions compared to our 195 million turnover”.



To overcome this barrier Proef’s strategy focuses on track record, alliances and competitive advantages (price and technical skills) as seen in figure 5.

One strategy to overcome the reputation barrier is to present the firm’s competitive advantages that differentiates it from the other suppliers. The most valuable competitive advantage of Proef is the technical skills. Portugal is one of the countries with the most penetration level of optic fiber in the world. The FTTH Council Europe and its research partner IDATE revealed data that shows Portugal with a penetration rate around 26%- see figure 7 and 8 compared with France (11%) and Germany (2%), (IDATE for FTTH Council Europe, 2017¹³). “We have much more experience in this area of Telecommunication compared to our competitors. Projects we are inserted in now in Europe, we already done in Portugal 5 or 6 years ago as we were integrated in the fiber optic projects in Portugal that now covers not only buildings but almost every house in the country” states the Europe’s COO Alfredo Ferreira (2017). He adds by revealing the firm’s positioning in Europe: “The strategy is to present ourselves not as the big ones but as the best ones”.

¹³ www.idate.org

Moreover, Proef can offer a low price as a competitive advantage since it has cheap labor compared to the other countries and also holds qualified and skilled technicians.

Another strategy is to present a valuable track record and engage in alliances. “Track record and partnerships are essential to gain reputation in the European market” (Hélder Longras, 2017).

Proef Group believes in partnerships and alliances as a way forward in the European markets to grow and gain reputation. It already has multiple partnerships, JV in other markets but in the European one is still in the process. The manager Hélder Longras (2017) states that: “It is really hard to partner with local suppliers. We have to offer our knowledge competences or a part of our business that the other firm lacks of in order to engage in a partnership”. One of the action plans of Proef for 2020 is to engage in partnership and M&A deals to gain growth and reputation- see figure 16. Regarding the form of alliances the Manager Hélder Longras (2017) says that “It is harder to engage in partnerships than in M&A deals”.

Discussion

Reputation is a major problem that Proef faces in Europe. This goes in line with the study of Proverbs et al. (2000) where reputation was ranked first in the list of severity of Construction Industry Problems. To surpass this problem, Proef uses its track record that has been identified as a success factor in construction industry by Wong et al. (2008). It is proved that a track record with big clients in different countries and with successful projects highlights the reputation of a firm. Moreover, to build reputation in the host country partnerships are considered an important strategy in order to gain local knowledge and access to the partner’s network base (Jewell, 2010). Finally, it was mentioned in the literature that to overcome liability of foreignness, in this case in the form of reputation in the host country, the firm should put in evidence the firm’s superior advantages (Zaheer, 1995). In case of Proef Group the competitive advantage comes from both FSAs and CSAs (Rugman and Verbeke, 2002; Dunning, 1980): skilled labor as FSA and low labor costs, a CSA from Portugal, the home country. Together, they give the firm a competitive edge next to potential clients.

5.2.2 Local Preference

Being Western Europe a developed economy, there is various and a big number of competitors in this market. Adding to this, there is a clear preference for local suppliers. The Deputy CEO Luis Andrade (2017) mentioned:” There is a clear local preference for suppliers and hence we were advised to operate in the second line with the big suppliers instead of directly with the big operators”. However, working in the second line there is a missed opportunity on the revenue that Proef would get if it would operate directly with the telecommunication`s operators. The reality is: Big telecommunication clients already have their preferred list of suppliers. Consequently, the entry of foreign firms becomes really hard. Why Proef and not an old trustworthy supplier?



The strategy to overcome this challenge is the same as the one used to overcome the previous barrier: reputation. Proef Group has to stand out. Once more, the competitive advantage of the firm needs to be highlighted: price and technical knowledge. Here, again, partnerships play an important role by helping Proef penetrate in the market with an understanding of the local culture, competitors and the market itself. M&A deals and JV with big suppliers is in Proef`s plans for 2020 in order to grow and be able to compete with the “big giants”. Not to forget, track record is crucial for making the firm differentiate itself from the competition.

Discussion

Local preference is another barrier faced by Proef Group, linked with the liability of foreignness concept. When a firm goes abroad there is a foreign firm disadvantage towards already established local firms. Local firms show a competitive advantage towards foreign firms in terms of knowledge of laws, regulations and existing networks (Ofori, 2003). Proef suffers from costs that arise from liability of foreignness (Zaheer, 1995) such as lack of legitimacy of the firm and economic nationalism. To overcome this local preference over foreign firms, Proef highlights its competitive advantage as a strategy to overcome LOF (Zaheer, 1995) uses its track record, a CSF in construction industry (Wong et al., 2008),

and makes use of the advantages of partnering and forming alliances with local suppliers another CSF identified in the literature (Jewell, 2010).

5.2.3 Language

The Europe's COO Alfredo Ferreira (2017) says "in Germany and France, mostly in Germany, the maternal language is really strong and the majority of the clients only speak the local language". This language barrier makes it hard for "technicians when they click the bell of a building to install a telecommunication setting and the top management level when they manage documents of clients in German language, for example" (Helder Longras, 2017).



Proef believes the strategy to surpass this cultural barrier is the localization of human resources - Proef Group hires local employees that are fluent in the host country language. However, this strategy comes at a high cost for the firm. Hence, this localization topic is further discussed in the sub-section 5.3.5.

Discussion

Proef Group struggles in Germany and France with the local language and is experience a competitive disadvantage in relation to local firms. This challenge is included in the liability of foreignness and concept (Zaheer, 1995).

In order to overcome this challenge, Proef engages in localization of human resources as proposed by Ling et al., (2005). This will allow Proef to hire local employees who are fluent in the host country language. However, hiring local employees do not drop the costs as suggested by Fryxell, Butler and Choi (2004) in an emerging market environment. Rather, in the western countries of Europe it gets costly to hire local employees in comparison to employees from Portugal.

5.2.4 Lack of qualified labor in the host country

In the above barrier, localization was proposed as a strategy to overcome the language problem. However there is “lack of qualified labor in Germany and France for the Telecommunication projects that demand high skilled labor and specialized technicians” says the Deputy CEO Luis Andrade (2017). In fact, Europe is having a skill problem as employers are struggling to hire high skilled labor¹⁴.

This problem is of a huge proportion as skilled craft workers accounts for nearly half the workforce of the construction sector- see figure 6. It is crucial for a CPS firms to have a skilled and competent workforce to give rise to a good performance.



In order for Proef to continue to deliver high quality services, it has to work with the best qualified and skilled employees. If it is hard to find local employees, Proef surpasses this barrier by expatriating Portuguese employees. In fact this strategy was putted into place in the beginning of the internationalization process. As mentioned already, Proef can proudly say their big advantage is the technical skills.

Proef's employees besides being highly qualified, they have experience in the area of telecommunications. They are currently doing projects in Europe that they already did in Portugal some years ago since Portugal is really advanced in the area of FTTH. “ While France and Germany still much use ADSL with copper and 10 or 13 *megas*, in Portugal almost every building and house with fiber and *megas* around 100” states Alfredo Ferreira (2017). Additionally, as mentioned in the reputation sub-section, Portugal already presents a level of FTTH penetration much higher than Germany or France.

This proposed strategy of “expatriation of Portuguese employees” together with the strategy of “localization” mentioned above will now bring us to the next topic: the dichotomy between local and Portuguese employees.

¹⁴ Skills challenges in Europe (2016) by cedefop:
http://skillspanorama.cedefop.europa.eu/en/analytical_highlights/skills-challenges-europe-2016

Discussion

Lack of qualified labor is a problem already identified in the literature regarding the construction sector (Proverbs, 2000). It is crucial, in an industry that highly depends in skilled workforce, to guarantee qualified workmanship. The skill component of a team is influential of a firm's performance, Ng and Tang (2010). In the literature, no strategy is proposed to overcome this barrier in the construction industry. Proef Group has the advantage of having skilled labor in their firm and in Portugal and expatriating employees can solve the problem of skill shortage in the host countries.

5.2.5 Dichotomy between local vs Portuguese employees

“One major challenge lies on the dichotomy between local vs employees from Portugal” says the Manager Hélder Longras (2017).

On the one hand, there is lack of skilled labor in the host countries and the Europe's COO Alfredo Ferreira (2017) adds that “employees from Europe are more expensive than Portuguese employees”. In fact the minimum wage of Portugal is less than half of France or Germany – see figure 9. However, it is important to localize human resources as it a source of local know how necessary to thrive in the host country.

On the other hand, expatriating employees from Portugal is also costly, as the Deputy CEO Luis Andrade states: “Having a person expatriated in these countries brings a set of logistical costs. We have to provide Housing, cars for mobility, for example.” and they lack knowledge about the host country environment such as language, a problem mentioned above. Additionally, most employees being expatriated didn't show willingness to leave abroad for a long period of time. Nonetheless it is still cheaper to expatriate Portuguese compared to local employees and they are highly qualified for the projects.

As we can see there are advantages and disadvantages of both strategies and it is important to understand how Proef manages this debate.



The first strategy of Proef was solely relied on the expatriating of local employees in the beginning of the internationalization journey. This strategy ended up revealing some problems in the long run. Employees from Portugal weren't able to speak the language, had no local know-how and weren't willing to leave abroad for a long period.

The current strategy of Proef Group is now a mix of localization of labor and expatriating local employees. This enables Proef to take advantage of the positive side of both strategies. The Manager Helder Longras (2017) clarifies the strategy: "Our strategy now is to hire local employees at the management level such as project managers to gain local knowledge and employees from Portugal with good technical knowledge at a lower level".

The plan of Proef for a near future is to engage in subcontracting of Portuguese small firms and local small firms. This strategy will allow Proef to become more flexible. The Deputy CEO Luis Andrade explains: "If we have 100 people in France, for example, and there is a period of low demand for projects, we end up with a rigid structure because we have our employees' kind of hostage in those countries". Subcontracting will allow for flexibility in the structure and help answering fluctuations in local demand.

Discussion

Proef's debate regarding the management of human resources is one of the main challenges the firm faces nowadays. This topic of hiring local workers, expatriate workers or use a combination of the two has already been discussed in the past literature but not with specification to construction firms. In order to surpass this barrier Proef used a mix of expatriation of employees and local employees as well as a strategy of home and local subcontracting, in which the latter goes in line with the author Ling et al. (2008) that considers subcontracting a form of competitive advantage in the construction industry.

5.2.6 Local subcontracting

Subcontracting is a good strategy in order to gain market knowledge and become more flexible.. However the Deputy CEO Luis Andrade points out how difficult it is to subcontract

in the local countries and explains why: “For example, for an operator like Ericson, he is indifferent between hiring a small Moroccan firm or Proef as the price is about the same. They end up choosing us because we are more qualified but they are not willing to pay us more than the Moroccan firms”. What happens is that for Proef it would be wise to subcontract these Moroccan firms. The problem is that these firms don’t accept this partnership because they would receive more by working directly with the Ericson, for example. Proef does not have the sufficient dimension to give them more than a supplier.



In order to overcome this barrier, the firm needs to grow in order to gain a sufficient size and reputation to be able to subcontract small firms. “This can be done by strategic alliances such as M&A deals and JVs” states the Deputy CEO Luis Andrade.

Until now, Proef does not have M&A deals in Europe but is planning to invest in it in a near future. In fact, Proef’s plans for 2020 show a big step in projects of M&A deals and JV- see table 6.”We want to develop the M&A area and engage in JV to create synergies. For example, partner up with firms in Germany that operate in the area of energy and electricity and we can offer a complementary business with our skills in the area of telecommunications” (Luis Andrade, 2017). The acquisitions of local suppliers will allow the firm to grow in size and to gain dimension to be able to compete with big suppliers.

Discussion

Ling et al. (2008) propose subcontracting as a business strategy for construction firms. However due to the small size of Proef Group, this strategy becomes a challenge. To grow in size to be able to engage in subcontracting, M&A and JV are considered an adequate strategy. These are considered drivers of a firm’s growth in the literature.

5.3. Innovation

Proef believes innovation thrive the business and it is one of the core values of the firm. All firms of Proef Engineering are constantly seeking innovation in their services, projects and in their teams in order to build a powerful group of specialized employees.

Innovation is considered by Proef to be an implicit strategy of the Group and it is a success factor intrinsic to the business. That is why innovation is putted in the findings` figure (figure 5) across all challenges and respective strategies as it is considered an underlying “success weapon”.

Currently Proef is developing around 6 projects for the horizon 2020 in the area of innovation. Selfnet, a European project for the development of 5G network, for example, and financed projects that enable the training of employees in this area of IT or “Proef next”, a project about how Proef sees the future, in terms of innovation, smart grids, virtualization and internet of things.

“We believe this dimension of innovation is the future, with the virtualization of things and we want to be prepared to keep up with the evolution of tools and the sector in general” states the Deputy CEO Luis Andrade (2017).

Discussion

In European Foundation for the Improvement of Living and Working Conditions Report (2005) the role of innovation and use of ICT is highlighted. Innovation is considered a crucial component to stay ahead of competitors and deliver high quality services.

6. CONCLUSIONS

This paper aimed at analyzing “How CPS firms overcome the specific challenges faced in mature markets”.

This is an area that has received little attention from researchers until today. Little is known about the internationalization of this type of service firms; challenges faced by CPS firms are restricted to country specific of origin, and there is no literature regarding strategies to directly face the encountered challenges. Moreover, studies have been focusing on emerging countries and challenges in mature markets seem to be overlooked regarding the internationalization of service firms.

Throughout this thesis it was important to clarify the specificities of this service sector, the challenges faced by this sector and existing strategies to face these obstacles in mature markets.

In order to answer the research question a case study was conducted using a practical case of a CPS firm: Proef Group; and its internationalization process to the western European market. The findings show that (i) reputation, (ii) local preference, (iii) language, (iv) lack of qualified labor in the host country (v) dichotomy between Portuguese employees and local employees and (vi) local subcontracting, take on a major part in challenging a CPS firm’s internationalization process to a mature market. Several ways of facing these barriers is through (i) localization, (ii) alliances/partnerships, (iii) track record, (iv) firm’s competitive advantages, (v) mix of employees from Portugal and local employees, (vi) expatriation of employees from Portugal and (vii) innovation- see figure 5 for an enlightening scheme.

This paper will contribute to a better understanding of the challenges faced by CPS firms when expanding to mature markets. This is believed to provide useful insights to every CPS firms to understand the strategies used to address such challenges. It has managerial implications as it shows specific ways of coping with specific challenges. As Proef Group showed in its path of internationalization, a smaller firm can rise to the challenges and prevail. The key take away is the following: in order to compete in an already established market, CPS firms must put in practice strategies accordingly to each challenge. Following this action plan, CPS firms will be able to thrive in a mature market and overcome the grand challenges facing the sector today.

One limitation of this paper concerns the heterogeneity of the construction industry. The challenges encountered in the literature section are general to the construction sector. It is important to understand that within this sector, the sub-sectors differ to a large extent - general construction, specialized construction activities for buildings and civil engineering work.

Regarding future research, it is important to notice that construction service sector is too broad of a concept and includes different subsectors that are different between them in terms of activities such as construction of buildings, civil engineering, and specialized construction activities. Hence, for future research I would recommend a deeper analysis on the different sectors inside the construction one to see if these show specific challenges when expanding to other countries.

Furthermore, future research should be undertaken using a quantitative methodology to measure the effectiveness of the mentioned strategies in this thesis on the specific challenges and their impact on the performance of the firm's internationalization.

Moreover, I believe that future studies should discuss how recent trends of growing population and innovation are adding to the recent challenges faced by the industry. More, if new trade regulations is facilitating or obstructing the expansion process to new markets.

It would be also interesting to know if the challenges identified in this thesis and the strategies proposed will still be relevant when new research is done on this topic.

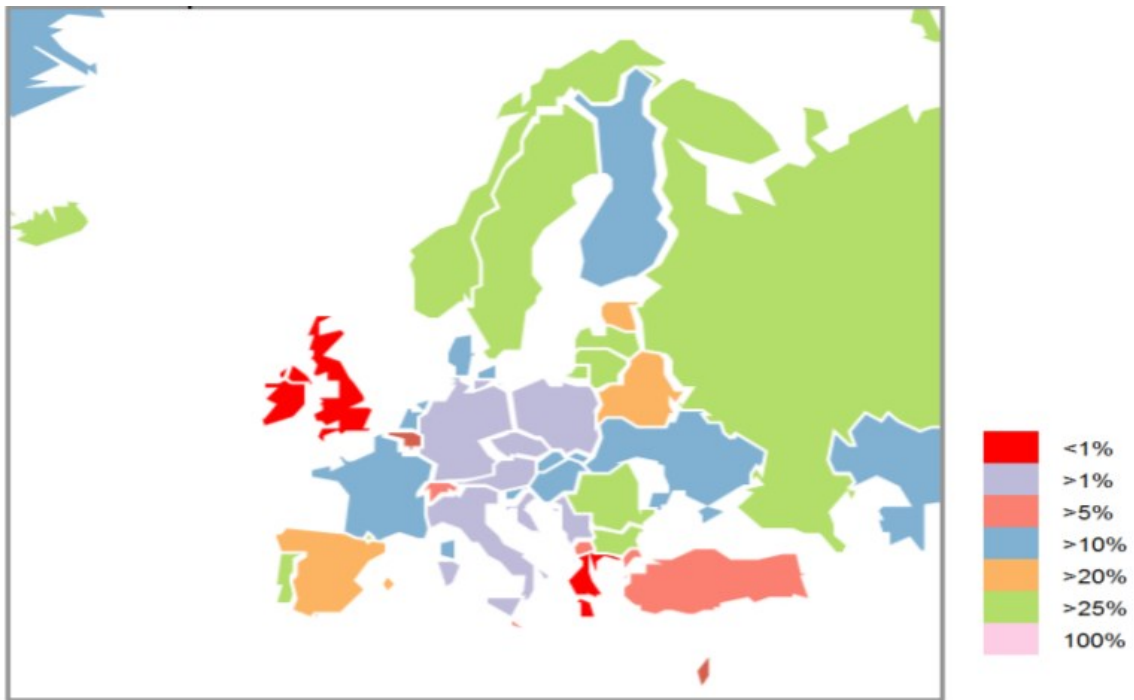
8. APPENDIX

Figure 6 - Employment by occupation in construction

	Construction and specialist contracting		All Industries	
		%		%
11 Managers	189,300	10.7	2,640,600	9.7
12 Proprietors	11,600	0.7	979,400	3.6
21 Science/technology professionals	62,800	3.6	851,700	3.1
22 Health professionals	500	0.0	241,100	0.9
23 Teaching/research professionals	3,000	0.2	1,159,300	4.3
24 Business/public sector professionals	25,800	1.5	684,100	2.5
31 Science associate professional	21,400	1.2	389,800	1.4
32 Health associate professionals.	1,300	0.1	889,500	3.3
33 Protective service occupations	3,700	0.2	249,200	0.9
34 Culture/media/sport occupations	6,900	0.4	469,100	1.7
35 Business/public sector assoc prof.	40,900	2.3	1,352,300	5.0
41 Administrative and clerical occupations	94,500	5.4	2,855,100	10.5
42 Secretarial occupations	54,100	3.1	1,192,300	4.4
51 Skilled agricultural trades	3,800	0.2	334,400	1.2
52 Skilled metal/electrical trades	231,700	13.1	1,537,600	5.7
53 Skilled construction trades	568,600	32.2	966,900	3.6
54 Other skilled trades	32,500	1.8	898,800	3.3
61 Caring occupations	400	0.0	980,200	3.6
62 Leisure occupations	6,700	0.4	544,700	2.0
71 Sales occupations	11,200	0.6	1,701,200	6.3
72 Customer service occupations	2,900	0.2	100,200	0.4
81 Process plant and machinery operatives	129,900	7.4	1,529,000	5.6
82 Transport drivers and operatives	55,300	3.1	925,900	3.4
91 Elementary manual workers	171,400	9.7	1,042,300	3.8
92 Elementary non-manual workers	35,700	2.0	2,628,800	9.7
Total	1,766,100	100.0	27,143,400	100.0

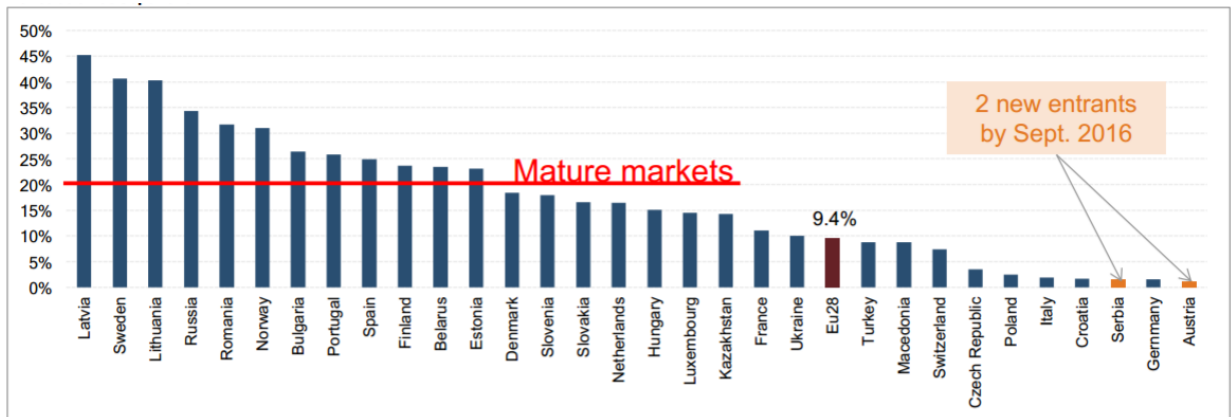
Source: Institute of Employment Research Estimates, 1998

Figure 7 - Penetration September 2016



Source: IDATE for FTTH Council Europe, 2017

Figure 8 - Penetration at Sept 2016



Source: IDATE for FTTH Council Europe, 2017

Figure 9 - Minimum wages by country, 2017



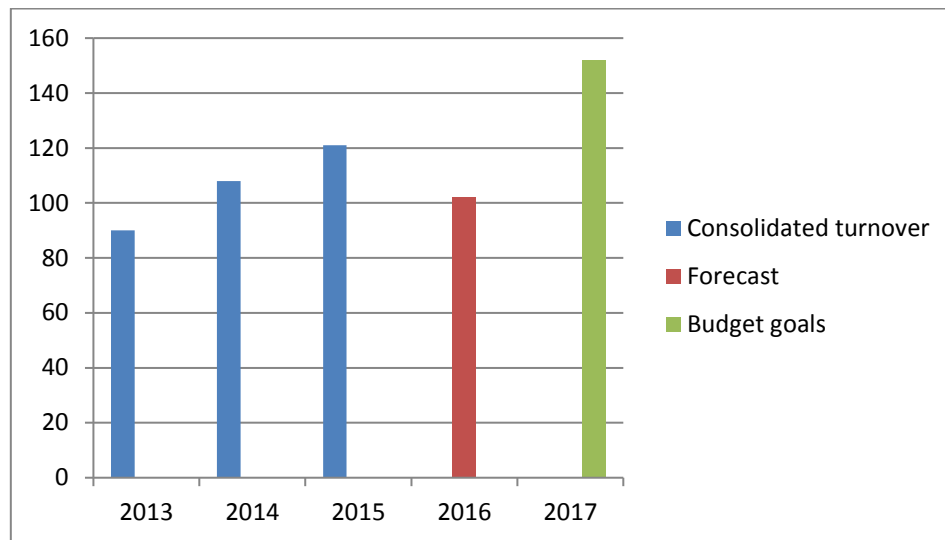
*The data shown here is a monthly rate, even if in some countries is an hourly or weekly rate. NMW pay is calculated on gross pay.

** €557 in 14 payments

*** Minimum wage is fixed at an hourly rate

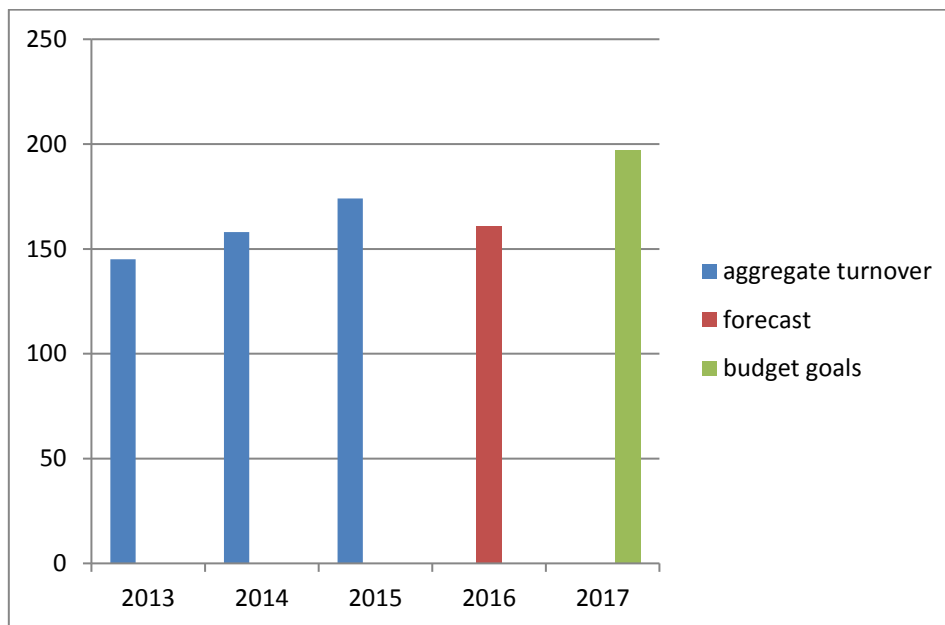
Source: Wikipedia, 2017

Figure 10 - Consolidated turnover in millions of euros (2013- 2017) of Proef Group



Source: Brochure of Proef Group, 2016 edition

Figure 11 - Aggregate turnover in millions of euros (2013- 2017) of Proef Group



Source: Brochure of Proef Group, 2016 edition

Table 6 - Europe Operational plan 2020, Proef Group

Deep Dive Business Development Europe

Strategy Go-to-Market	Establishment of a set of initiatives per region to guarantee the achievement of the goals. These initiatives englobe market shares, entry in new clients and the bet in new services.
Model of commercial action	Definition of an action plan that allow managing the commercial activity.
Partners Compliance	Definition and implementation of a management model for the partnerships, to clarify the relationship with partners and identify competences for the partners to capture.
Partners Growth	A framework of accompany with the aim of establishing technical partnerships that allow for maximization of efficiency in the operation of each market.

Source: Proef's Operational Plan for 2020 strategy, 2016

Table 7 - Sources of data collection for the case study

<i>Data Sources</i>	<i>Type of data</i>	<i>Use</i>	<i>Source</i>	<i>Date</i>
	Awards	Company internationalization position	Riep	2015 and 2016
	Brochures	Definition of the areas of business and overview of the firm's situation	Proef Group	2015 and 2016
Archival data	Industry websites	Overview of the industry and sector	WTO and UNSTAT https://unstats.un.org/unsd/cr/registry/regcst.asp?Cl=27 https://www.wto.org/english/tratop	2017

			_e/serv_e/serv_sectors_e.htm	
	Company website	Overview of the firm	http://www.proefgroup.com	2017
Documentation	Strategic Plan for 2020	Next steps in the internationalization process of the firm	Proef Group	2017
	Europe operational plan for 2020	Next initiatives for the internationalization in the European market	Proef Group	2017
Interviews	Interviewer 1	Overview of the company, business, internationalization process	Manager Hélder Longras	March 2017
	Interviewer 1	Challenges faced by the firm in the internationalization and respective strategies	Manager Hélder Longras	April 2017
	Interviewer 2	Challenges faced by the firm in the internationalization and respective strategies	Alfredo Ferreira from the Executive Committee COO Europa	May 2017
	Interviewer 3	Challenges faced by the firm in the internationalization and respective strategies	Luís Andrade from the Executive Committee Deputy CEO	May 2017

Source: Author

Figure 12 - International ranking of Portuguese companies 2016

TABELA 2

RIEP – Índice de Transnacionalidade

CLASSIFICAÇÃO	EMPRESA	ÍNDICE	VARIAÇÃO 15/14
1	INAPA	0,9088	↘
2	LOGOPLASTE	0,8794	↗
3	CASAIS	0,8034	↗
4	GRUPO ASCENDUM	0,7896	↗
5	GRUPO RAMOS FERREIRA	0,7361	↘
6	MOTA-ENGLIL	0,6699	↗
7	GRUPO PCG	0,6446	↗
8	HOVIONE	0,6348	↘
9	NBC MEDICAL	0,6289	↗
10	GRUPO LENA	0,6069	↘
11	GRUPO CJR	0,5737	↗
12	PATINTER	0,5621	*
13	OUTSYSTEMS	0,5338	↗
14	GRUPO NORS	0,5326	↘
15	TAP	0,5290	↗
16	INDASA	0,4725	↗
17	VILA GALÉ HOTÉIS	0,4346	↘
18	CONSULGAL	0,4318	↗
19	GRUPO PROEF	0,4147	↘
20	OZA AUTOADESIVOS	0,4019	*
21	ÁBACO CONSULTORES	0,3641	*
22	PARFOIS	0,3524	*
23	CX. GERAL DE DEPÓSITOS	0,3453	↗
24	GRUPO PRIMOR	0,3384	↗
25	GRUPO LUÍS SIMÕES	0,3297	↘
26	SONAECOM	0,3271	↘
27	PRIMAVERA	0,3248	↗
28	BIAL	0,3177	↘
29	WEDO TECHNOLOGIES	0,3113	↘
30	SEVEME	0,3072	↗

31	ROFF	0,3016	↗
32	AFAPLAN	0,2713	*
33	SACRAMENTO CAMPOS INVEST.	0,2677	*
34	GRUPO PETROTEC	0,2175	↗
35	HAKKEN GROUP	0,2134	↘
36	TECHFRAME	0,1866	*
37	PACISIS	0,1819	*
38	RENOVA	0,1628	↘
39	IMPACTING	0,1448	*
40	GRUPO QUADRANTE	0,1412	↘
41	ONEBIZ	0,1389	↘
42	REDITUS	0,1281	↗
43	NOVABASE	0,1237	↘
44	COMPETIR	0,1197	↗
45	GRUPO LCG	0,1178	↘
46	PHC SOFTWARE	0,1104	*
47	VORTAL	0,1019	↘
48	MONTEPIO GERAL	0,0847	↗
49	SAPHETY	0,0831	↗
50	QUINTAS E QUINTAS/SOLIDAL	0,0769	↗
51	LIFT WORLD	0,0612	↗
52	BRISA	0,0599	↗
53	PAVIGRÉS	0,0404	↘
54	AGRINDA	0,0363	↘
55	COMPTA	0,0249	↘
56	RESIQUÍMICA	0,0144	↘
57	ADP - ÁGUAS DE PORTUGAL	0,0027	↘

(i) Índice de Transnacionalidade médio – 33%

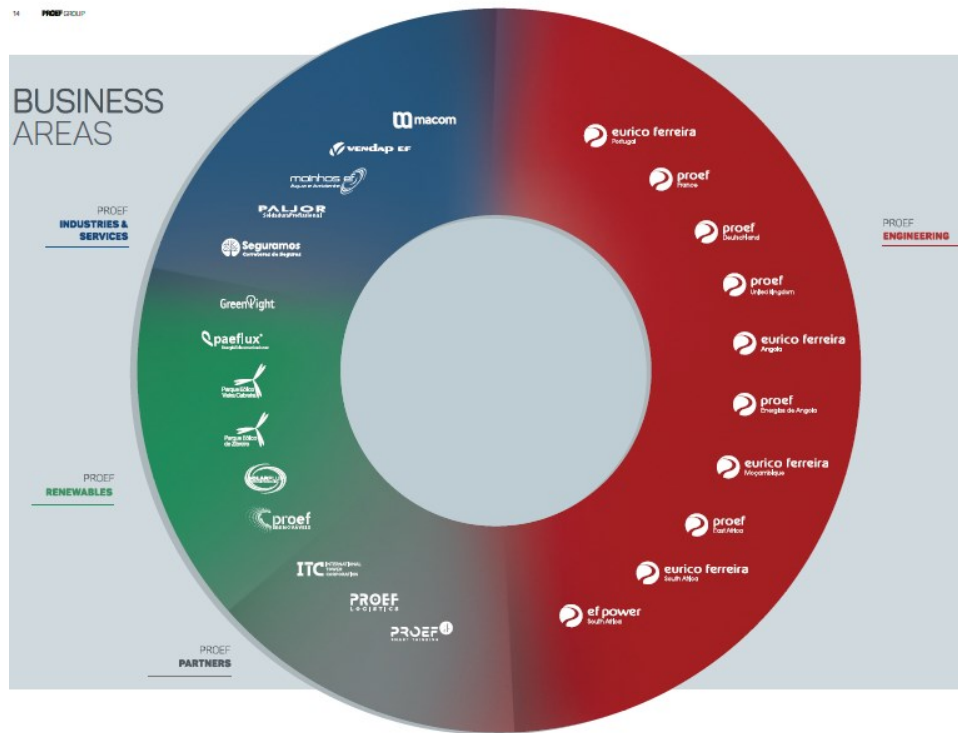
(ii) Índice de Transnacionalidade médio das dez empresas mais internacionalizadas – 73%

* Empresas que participam no RIEP pela primeira vez ou em edições não consecutivas

FONTE: INQUÉRITO RIEP 2016

Source: RIEP 2016 inquiry [accessed on 2 May 2017]

Figure 13 - Proef's Business areas



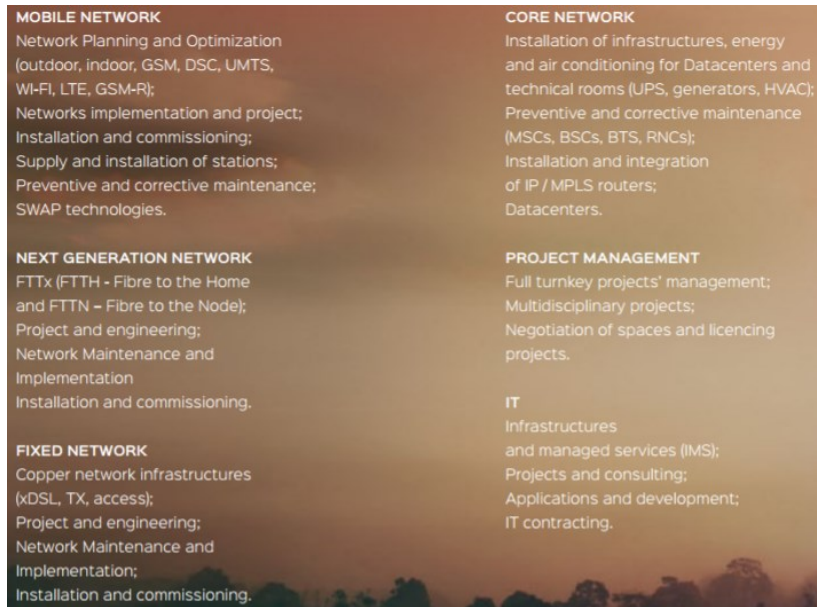
Source: Brochure Proef Group, 2016

Figure 14 - Proef Engineering enterprises of Proef Group



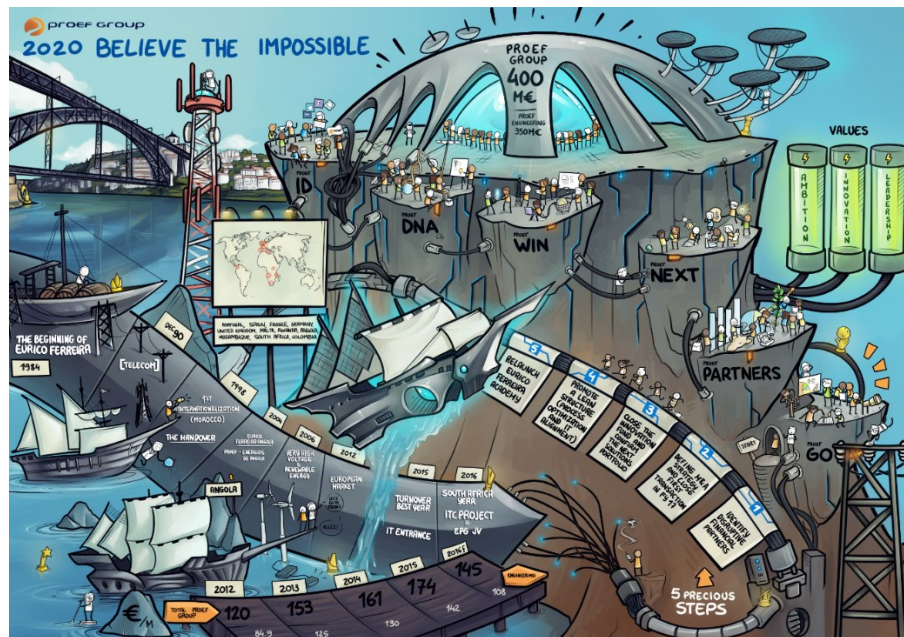
Source: Brochure Proef Group, 2015

Figure 15 - Diversified portfolio in the Telecommunications area



Source: Proef's brochure, 2016

Figure 16 - Strategic map Proef 2020



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