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OUTSOURCING OF MANAGED TELECOMMUNICATION SERVICES: REASONS AND IMPLICATIONS ON SERVICE DEVELOPMENT AND BUSINESS MODEL

A PRACTICAL CASE STUDY IN AN INTERNATIONAL TELECOMMUNICATION SERVICE PROVIDER

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Abstract

This paper comes from the specific need of developing and launching in the telecommunication market a new managed service. Studies about the benefits that managed telecommunication services give to the business of multinational corporations had been already performed. This paper tries to go further by analyzing why local telecom operators and carriers, that used to provide to the end customer full managed services, are now sourcing service management and support activities to specific companies that belong to the same group and used to play the role of international wholesalers. The study is conducted by comparing empirical data gathered with a case study approach in a real telecommunication company, with the theories and the existing studies related to the topic. The first aim is to understand the reasons of this restructuration of an integrated telecommunication operator, in terms of roles and activities to be performed by the different companies that form a whole telecom group. The second aim is to understand the theoretical and managerial implications that this change have in the development of the new activities required to provide a managed telecommunication service.

A Mamma e Papà,

per tutte quelle volte che non sono stato capace di dirvi GRAZIE

(To Mom and Dad, for all those times I haven't been able to say THANK YOU)

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Steve Jobs, in his commencement speech to graduated students of Stanford University said that "*you can't connect the dots looking forward; you can only connect them looking backwards*".

The end of this Master Thesis seems to be exactly one of those moments when you realize it is time to look backwards and connect the dots that composed a chapter of your life that is about to end.

Thus, I feel inside the need of giving thanks to all those people that somehow contribute to write this chapter.

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List of Acronyms

CAPEX Capital Expenditures

CDN   Content Delivery Network

CoS   Class of Service

CP   Content Provider

CPE   Customer Premises Equipment

DSP   Distribution Software Provider

E2E   End to End

EC   End Customer

EMEA Europe, Middle East, and Africa

HLD   High Level Design

HP   Hosting Provider

HR   Human Resources

ICC   International Control Centre

ICT   Information and Communication Technology

IP   Internet Protocol

ISP   Internet Service Provider

IT   Information Technology

KPI   Key Performance Indicator

LAN   Local Area Network

LATAM Latin America

LLD   Low Level Design

MNC Multi National Corporation

MPLS Multi Protocol Label Switching

MRC Monthly Recurrent Cost

MSA Master Service Agreement

NMS   Network Management System

NRC   Non Recurrent Cost

NOC   Network Operations Centre

NSD   New Service Development

NSP   Network Service Provider

OB   Operational Business

OMKT Operative Marketing

OPEX Operational expenditures

PoP   Point of Presence

PMKT Product Marketing

PMO Project Management Organization

QoS   Quality of Service

RBV   Resource-Based View

RFP   Request for Proposal

RPF   Resource Process Framework

RV   Relational View

SLA   Service Level Agreement

SWOT Strengths, Weaknesses, Opportunities and Threats

TS   Telecom Spain

TW   Telecom Wholesale

TCE   Transaction Cost Economics

TM   Telecom Multinational

TUS   Telecom US

TTM   Time to Market

VPN   Virtual Private Network

WAN   Wide Area Network

1 Introduction

Telecommunication industry has been facing difficult times. The sector is continuously evolving and rapidly changing, new players of the information industry have been progressively reducing telecom and network providers' power as well as profits. In this scenario, telecom providers are re-organizing their structures and their portfolios of products and services with the aim of increasing revenues by looking for new opportunities and optimize operative costs as well as dedicated investments (Bramson-Boudreau, 2010).

This Master Thesis will focus on a specific segment served by telecommunication service and network providers: corporations and multinational companies. Also this segment is rapidly evolving, with the business environment that is becoming more and more global and international (McIvor, 2005). More and more frequently, companies that used to operate in local and regional markets are extending their operations and their presence in other countries and in other regions, becoming globalized (Thomas, 2009). These changes are affecting also telecommunication providers, which are required to develop services for corporations with specific needs of connectivity and wide geographical extension (Thomas, 2009).

The combination of these two factors is at the basis of this research: on one side the requirements of worldwide connectivity of the multinational corporations, on the other the need of telecom operators to optimize costs, push local telecom operators to source the provisioning of managed telecommunication services for corporations from specific entities that play, within telecom groups, the role of international wholesale provider.

The analysis of this phenomenon and the related implications will be based on an empirical study carried out in one of the largest and most important telecommunication companies of the world.

2   Introduction to the company

This chapter will be a brief presentation of the company where the research has been carried out. Due to confidentiality reasons, the real name of the organization will be replaced with a fictitious name all along the study. Firstly, general information about Telecom Spain Group will be given. The aim is to get a general idea of the structure of the whole group, whose local business units have been requiring managed services to the international telecom provider. The second section will go through the details of Telecom Wholesale, which is the international provider of the group, as well as the company where this study has been carried out.

2.1   Tele Spain Group

Tele Spain is a Spain-based company considered to be one of the leader operators in the telecommunication industry worldwide. It provides a wide range of products and services, from connectivity to information and entertainment applications. The group with its brand portfolio is present in Europe, Latin America and Africa, operating in 25 countries and serving more than 280 millions of customers worldwide. Tele Spain Group has organized its operations in three geographical regions: Spain, Europe and Latin America (company's web page).

The headquarters of the corporation are located in Spain. The central office is in charge of the definition of the global and organizational strategies as well as of the coordination of activities and operations of the independent companies that are part of the group (company's web page).

Telecom Spain is the telecommunication leader in the country, having almost 90 years experience in Spain, and nowadays it serves more than 40 million customers. It has a wide portfolio of products and services, including fixed and

mobile telephony, pay TV, Broadband, and Internet Services (company's web page).

Telecom Latino America is an integrated operator that operates in 13 countries with local brands; it is the leader operator in Brazil, Chile, Peru, and Argentina, and it has operations and well established presence in the other countries of Central and South America. In total, it serves there almost 200 million customers. *Telecom Latino America* has recently extended its presence also in USA with a business unit called *Telecom US* (TUS) (company's web page).

Telecom Europe has substantial operations and direct presence in Germany, UK, Ireland, Czech Republic, and Slovakia, countries where the group operates under independent brands, providing more than 50 million customers. Moreover, it has shares participation in other providers like Telecom Italia. Furthermore, the group offers wholesale telecommunication services through the business unit Telecom Wholesale, and it serves international and multinational corporations through its business unit Telecom Multinational (TM) (company's web page).

As a whole, Tele Spain Group is the fifth in the telecommunication industry worldwide, and the first integrated operator in Europe.

The figure below displays the regions of the world where Tele Spain Group has direct presence:

Figure 2-1: Presence of Tele Spain Group. Source: Company's Documents

2.2   Telecom Wholesale

Telecom Wholesale (hereinafter TW) is an independent company which is part of Tele Spain Group. Until few years ago TW had a strategy that aimed to be not only a network operator but also to become a regional service provider. Instead, TW has recently changed its whole strategy with the aim to move to a global service provider in order to exploit its global infrastructure (Mello Veiga, 2010). Nowadays TW has a tangible and clear mission within Tele Spain Group, which is to provide global telecommunication services for fixed and mobile carriers, Internet Service Providers (ISPs), content providers and multinational companies (MNCs) (company's web page).

Consistently with the mentioned strategy, TW has been acquiring for the last years important operators in Europe, and operations in Latin America. Furthermore, the company has been signing partnership agreements as well as purchasing minority stakes of other carriers around the world.

With TW's business, Tele Spain Group essentially aims to cover two main needs. Firstly, by providing one single point of contact for the provisioning of international services, the group can streamline services to wholesalers and MNCs that belong to its footprint. Secondly, it can achieve cost minimization by aggregating international traffic needs of the group as well as global management, especially for the MNCs segment (Mello Veiga, 2010).

Strategic objectives

Beyond the whole corporation strategy, nowadays TW is willing to exploit and leverage its global platform and infrastructure. In fact, TW with its assets is able to offer to its wholesale customers the possibility to outsource any element of their business, from the network accesses to the end-user management of their services (company's documents).

As already mentioned, not only is TW a wholesale services provider, but also a company which is part of a larger group. This means that besides the company's business objectives, the synergies of the group have an important weight in the achievement of overall strategic objectives of the corporation.

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Bearing in mind this double face, TW's strategic objective can be summarized as following:

TW's strategic objectives

To gather inbound international traffic, providing a single interface for international carriers wherever the Group has presence
To act as the Group's international carrier to meet all the international traffic needs
To provide international IP connectivity for the Group's local ISPs through its international backbone
To maximize return on existing assets (opex and capex management) fostering the Group's synergies
To provide global scope to all fixed and mobile services for MNCs and for new innovative services that can leverage in its global presence

Table 2-1: TW's Strategic Objectives. Source: Company's web page

2.2.1 TW customers

TW is a wholesaler, meaning it sells international telecommunication services to other local operators and carriers, without reaching directly the final customer (people or organizations). TW's customers might be divided into two main categories.

The first category includes carriers and operators that are part of Tele Spain Group; these are usually called OBs (Operational Business), like for example Telecom Spain (TS), Telecom US (TUS), and Telecom Multinational (TM). These OBs are part of the so called on-net network of the Group.

The second category of customers includes all the local operators, international network providers and carriers that are not part of the Group but with whom TW signed agreements and alliances for the provisioning of its international services. KPN, Telecom Italia, China Unicom are only few examples of customers of this category (company's documents).

TW and TM

Among all the customers of TW, there is one, TM, which needs some specific considerations. TM is a special OB of Tele Spain Group that, instead of

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covering a specific area or country, was purposely created to cover the MNCs market. TM has almost 200 multinational customers (within the others, Adecco Group, BBVA, and Mercedes-Benz) to whom it guarantees TW's international coverage and provides them with TW's international telecommunication services (company's web page).

2.2.2 TW coverage

TW provides international telecommunication services around the world thanks to its 45000 kilometers of fiber optic network and two international Network Operations Centers (NOCs). TW is present in 47 countries of the world with more than 120 Point of Presence (PoP, which from a technical point of view is the set of equipments that connects TW network with local operators or network providers) (company's documents).

TW is connected to around 300 international carriers around the world and it has on net terminations in all the countries that are covered by carriers and operators that are part of the Group.

TW markets may be ideally divided into two main areas, LATAM and EMEA. LATAM refers to all the Latin America and North America coverage. Especially in Latin America TW has on net presence through all the local operators and carriers that are part of Telecom Latino America. A new division called TUS has been created recently to increase the presence in North America, where TW used to be with off-net agreements mainly with AT&T and Verizon (company's documents).

EMEA is all the area that includes Europe, east Europe, Mediterranean Basin, and Middle East countries. Thanks to business agreements and acquisitions TW is now present in almost all the European countries, including Austria, Belgium, Bulgaria, Denmark, Estonia, Greece, Hungary, Italy, Netherlands, Poland, Portugal, Romania, Slovakia, Sweden and Switzerland (company's web page).

In order to extend its presence in Asia Pacific, TW owns participations of the Chinese telecom operator and recently opened a PoP in Hong Kong (company's documents).

The figure below shows the coverage of TW:
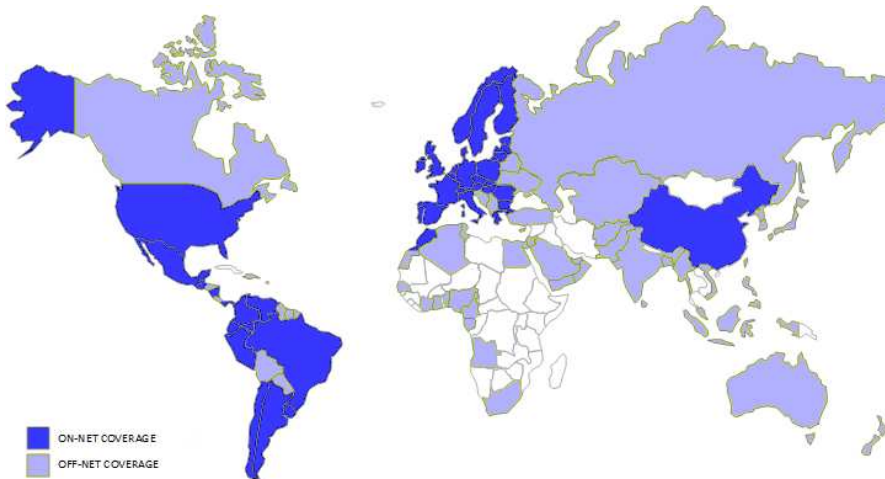
Figure 2-2: TW's Coverage. Source: Company's Documents

2.2.3 TW Portfolio

TW develops and offers a wide range of telecommunication services that might be grouped into six categories: voice, capacity, satellite, corporate, IP interconnection, and mobility.

The following table summarizes each of the mentioned categories.

Telecom Wholesale Portfolio		
Category	**Description**	**Examples**
Voice	Access to international network, with direct routes to more than 150 international carriers. Global access, high voice quality and a high degree of ISDN capillarity.	Transit, International Termination, ISDN (data/video telephony), Freephone, International VoIP
Connectivity	Broadband communication through open, unrestricted access door-to-door on auto-restored Fibre Optic Network. Connectivity provided between Europe, Latin America and the United States with high reliability.	SDH/SONET, Wavelength, IPLC Service
Satellite	Solve the deficits in other communications infrastructure, reaching where the others don't. Most of the times these services complement, rather than compete with the rest of the solutions.	VSAT-IP, GSMoSatellite, BGAN, Satellite Broadcast
Corporate	Wholesale connectivity and international data services aimed at multinational end customers and corporations that provide end-to-end service.	Clear Channel, MPLS VPN, Global LAN, Telepresence, Corporate Telephony
IP Interconnection	IP Interconnection services provide content transport with high speed and quality, total availability and optimum transport of traffic at all times, with the possibility of providing different QoS. This IP network are adapted to the needs of fixed and mobile telephony carriers and ISPs	Internet Transit, Ipx transport
Mobility	Mobility services that facilitate convergence, with a single point of contact, providing integrated, secure, high-quality management adapted to the needs of each mobile carrier	MMSRelay, Roaming WLAN, Dual IMSI, SMS Hubbing

Table 2-2: TW's Services and Products Portfolio. Source: Company's documents

3   Problem definition and Research Questions

In this chapter it will be defined the problem at the base of this study and the related research questions that this study will try to answer. In the first section unmanaged telecommunication services will be presented and described. In the second section the same will be done with end-to-end managed telecommunication services, with the aim to highlight the main general differences. In the third and last section of the chapter, the research questions related to the problem definition will be presented.

3.1   Unmanaged Services

In telecommunication industry, services are provided through a network that belongs to different carriers or network providers. In the specific case study, there are three actors involved: the local service provider (customer), the international service provider (TW) and a third party network provider.

The customer is the network provider that requires the service to the international service provider on behalf of an end customer. The end customer, usually a MNC, requires connectivity between sites (CPEs) that are spread all over the world. The network of this local provider is usually called A-End of the service.

The third party network provider is the owner of the network where the other site of the end customer is located. This carrier provides connectivity to the site by connecting it to the local network. This part of the service is called B-End.

The connectivity between the two local networks is provided by the International Service Provider (TW) through its PoPs. From one side, the international provider sells the service to the customer (in the A-End), from the other side (the B-End) it makes an agreement with the third party carrier to have access to the network. This part of the service is called I-End (International End).

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The figure below shows the three parts of the service:
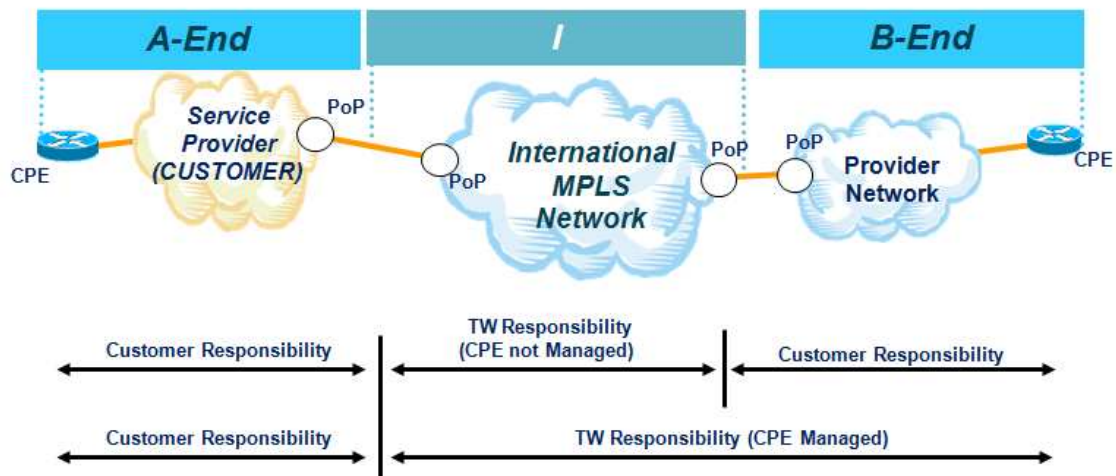
Figure 3-1: Representation of the parties involved in the telecom service. Source: company's documents

In unmanaged services, the international network provider is responsible for provisioning the service, and its NOC is responsible of configuring and monitoring the international IP network. Furthermore, the international provider is also responsible for coordination of operations with third party operators in the destination countries. Basically, TW acts as the provider of the I-End and the terminations (B-ends) in other countries (company's documents).

Instead, the Management of the VPN is not part of the responsibility of TW. It is the OB/Carrier that commercializes the service (customer) the responsible for the monitoring and management of all the CPEs of the end customer (company's documents).

The NOC of the customer will be responsible for the management of the whole service, regardless whether there are corporate offices in remote countries, because it will be the only center with access to all the elements of the VPN. Therefore, the carrier which actually commercializes the service will be responsible for configuring the network, monitoring it, and responding to any malfunctions or incidents (company's documents).

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Only in the case the international provider is responsible for the provisioning of the CPEs to the final customer, it will be also responsible for ensuring that all of the elements provided with the VPN service are operational (accesses, bandwidth, CPEs) (company's documents).

Summarizing, as shown in Figure 3-1, in unmanaged services the international provider is responsible of the provisioning and maintenance of the elements of the I-End and of the B-End of the service, as well as it is responsible of the management of the only I-End. The A-End maintenance and the whole service management is instead responsibility of the customer (company's documents).

3.2   End to End Managed Services

The new trend of the telecommunication market as well as the strategy of Tele Spain Group is now to move from an unmanaged to a managed service. This does not affect directly the final customer, which already is and still will be provided with a service managed site-to-site. The difference is that local carriers (and OBs) want to outsource the management of the service to international service provider (TW), which will be in charge of the whole end to end service management.

In general terms, managed services provide an additional management layer to the unmanaged ones, allowing the international wholesaler to take the end-to-end management of the complete customer's service (company's documents).

Therefore in managed services not only will the International Network and B-End elements be managed and maintained, but the service also includes the management and maintenance of the end customer's CPE's (both B-End and A-End), no matter location, suppliers, or acquisition modality (company's documents).

On the other side, the OB will maintain the commercialization of the service to the final customer. Thus, TW is now developing a new category of services to be included in the portfolio.

The following figure shows the three parts of the service with the new scope:
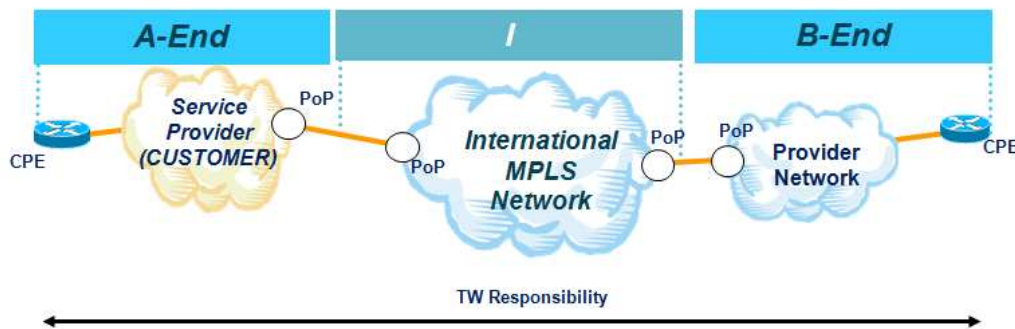
Figure 3-2: Representation of the scope of Managed Services. Source: Company's documents

3.3 Research Questions

The outsourcing of service management to the international wholesaler implies that a company like TW has to develop new functionalities to be added to the service as well as perform new activities that are required to take the responsibility of the new management layer. This has impact on the business model of the organization, which will include activities that were not performed before and, as a direct consequence, it has important implications on the Service Development Process.

Considering the general background presented, and the problem defined in the previous sections, the author has identified the scope of the Thesis:

- ✓ Firstly, there will be a review of the literature concerning the outsourcing phenomenon, which aims to understand why local operators are requiring the outsourcing of the end-to-end service management to the international wholesaler.
- ✓ Secondly, the business model of managed services will be studied to identify all the activities that the international wholesaler has to internalize as consequence of the outsourcing phenomenon previously defined.
- ✓ Finally, the service development process will be studied in order to assess what the implications of this trend are in the development process of an international wholesaler.

4   Literature review

The objective of this chapter is to analyze the current literature available on the main topics that this thesis will cover. This analysis aims to be the source for the development of the theoretical framework to be used for the empirical study, as well as to provide the direction for the generalization of it. The chapter is structured in three main sections. In the first one, it will be presented the theoretical background on outsourcing, the factors that have been driving to this strategy, an overview of the main theories, and the potential benefits and pitfalls of the phenomenon. The second section will be about new service development process, the most important process-based and resources-based models, with a last part dedicated to the development of telecommunication IP-based service. The third section of the chapter will be a review of the theories related to business models and value chain, with a last part dedicated to telecommunication business models.

4.1   Theoretical Background on Outsourcing

Outsourcing is probably one of the most debated topics in management literature. Outsourcing phenomenon has been studied for many years with increasing interest; many theories have been adapted to the analysis of outsourcing, and outsourcing strategies have been studied from different perspective (Espino-Rodriguez & Padron-Robaina, 2006). The following sections aim to be a review of the topic and of the related theories.

4.1.1   Definitions of outsourcing

At the most general level, outsourcing can be defined as a set of "make or buy" decisions taken by a firm in order to obtain the supply of products or services that are needed by the organization to run its business (Harrigan, 1985) (McIvor, 2005). Loh and Venkatraman (1992) provide a more IT oriented definition of outsourcing when they define it "*as the significant contribution by*

external vendors in the physical and/or human resources associated with the entire or specific components of the IT infrastructure in the user organization" (Loh & Venkatraman, 1992). A more exhaustive definition of outsourcing underlines the concept of externalizing to another organization some functions that were previously performed internally by the firm (Rothery & Robertson, 1996). Another important concept that is largely attributed to outsourcing is the differentiation between core and support activities: Quinn and Hilmer (1994) perfectly highlight this idea in their definition of outsourcing, assessing it as the external acquisition of activities that were previously considered part of the firm, given that all of these activities are not part of the core capabilities of the firm. There are two points that should be stressed in order to understand the implications they have. Firstly, outsourcing involves the externalization of activities that were previously performed in-house. It is important at this moment to introduce the concept of Vertical Integration, which refers to the level of ownership that a firm has on the business activities (McIvor, 2005). Outsourcing involves a change in the firm's boundaries and a progressive shift from the hierarchical structure of the organizations to the market governance (Loh & Venkatraman, 1992). Specifically, according to the authors, outsourcing can be considered as a hybrid organizational form that combines both hierarchical and market elements. Secondly, outsourcing involves those activities that are not considered part of the core business of a firm. This statement opens the debates on what activities have to be considered as "core" or "primary" instead of "support" (Porter, 1985)[1] as well as on the absolute validity of the fact that only support activities can be outsourced. The last decades have seen the increasingly tendency of enterprises to outsource also the so called "primary activities", those that drive competitive advantages to the firm (McIvor, The Outsourcing Process - Strategies for Evaluation and Management, 2005). This phenomenon, however, is beyond the scope of this study.

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[1] Porter in his definition of value chain defines as "primary activities" the inbound logistics, operations, outbound logistics and marketing and sales, while "support activities" are human resources management, procurement, technology development and firm infrastructure. The former activities provide the competitive advantage to the firm, so they should be performed internally, while the latter can be outsourced because they only support the primary ones.

4.1.2 Traditional explanations of Outsourcing

Regardless the specific advantages and disadvantages of outsourcing, the literature has identified three main reasons that have been leading corporations to undertake this strategy (Strange, 2009).

First of all, outsourcing allows firms to concentrate resources and capabilities on their core business, in order to focus on those activities that provide the best competitive advantages (Quinn & Hilmer, 1994) (Strange, 2009).

Secondly, as assessed by Strange (2009) firms have to cope with scarcity of resources, and this is the reason why they specialize themselves, in order to take the most out of those resources and achieve sustainable competitive advantages. In this sense, outsourcing enables organizations to complement the resources they own with the ones owned by other firms (Gottfredson, Puryear, & Phillips, 2005).

The third reason proposed by Strange (2009) is that external suppliers, providing the same output to a considerably high number of customers, are able to achieve economies of scale and economies of specialization. In this way, firms are provided with outsourced products or services with higher efficiency, better quality and lower costs (Abraham & Taylor, 1996).

4.1.3 Relevant changes in the business environment

Business environment has been facing enormous changes for the last decades, and some of these changes are increasingly driving corporations towards outsourcing strategies (McIvor, 2005). Next, an overview of these changes is provided.

Globalization

International agreements have been cutting trade barriers enabling the shift from local and national markets towards a single global market. Firms are increasingly competing on a global basis, both in terms of geographical positions of the production sites and of markets to serve. This phenomenon, according to McIvor (2005), presents two important consequences. On one side, the opportunity to achieve economies of scale more easily, to share

investments across the international markets, and to move production to countries with lower labor costs. On the other side, firms have been coping with increasing complexity of the business environment, in terms of competition as well as in terms of network coordination. Outsourcing is more and more linked to the globalization because it allows corporations to take advantage of the opportunities presented while reducing the complexity of their own value chain (McIvor, 2005).

Development and diffusion of ICT

The rapid development and diffusion of Information and Communication Technologies (ICTs) have deeply affected the business environment. Firstly, in many industries ICT has changed the way organizations perform their business, becoming a source of competitive advantage while remaining a support to the core activities. Secondly, ICT and Internet have made information more available and enabled communication, thus cutting costs of transactions and relationships (McIvor, 2005).

Reforms of the public sector

Governmental reforms aimed to change the hierarchical structure of the public sector into a more market oriented structure, lead by the idea that increasing competition could raise the performance of the public sector at the levels obtained in the private one. The most evident consequence of this trend is the privatization of industries that were previously owned by governments, for instance telecommunications and energy. This shift towards market-oriented governance has enabled outsourcing (McIvor, 2005).

Customers became more demanding

Global accessibility to information, increased mobility and higher market competition have made customers "*more sophisticated and demanding*" (McIvor, 2005), decreasing their loyalty towards products and services, and increasing their expectations. For all these reasons firms are required to be more reactive to the changes in customer needs. As already mentioned, outsourcing allow firms to focus their resources on what they do best as a sustainable competitive advantage (McIvor, 2005).

4.1.4 Theoretical foundations of outsourcing

An enormous variety of models and theories on outsourcing have been developed in the scientific literature. Lee et al. (2003), in the same way of Strange (2009), categorize them according to three main different perspectives used to explain the mechanism of outsourcing: economic, strategic management, and social (Lee, Huynh, Kwok, & Pi, 2003).

Economic theories focus on concepts like economical benefits and transaction costs of the phenomenon. They all refer to the transaction cost economics (TCE) models (Coase, 1937), (Williamson, 1979).

Strategic Management theories take the core competencies and resource based perspective to assess whether and when outsourcing can be a source of competitive advantage (Quinn & Hilmer, 1994) (Grant, 1991).

Social theories analyze the inter-organizational and relational aspects of the outsourcing process between the involved parties (Dyer & Singh, 1998).

Transaction Cost Economics

Coase (1937) was the first one to recognize the importance of developing a model for transaction costs in a market governance structure. Transaction costs are not equal to zero, and specifically they refer to the cost of searching and organizing information, setting up and controlling the relations, and safeguarding interests of the parties involved in the transaction (Coase, 1937).

The two main drawbacks of the market governance structure are *bounded rationality* and *opportunistic behavior* (Coase, 1937). The former concept, as described by Aubert et al. (1996), refers to the natural incapacity of the human being to find and process all the available information, so that any transaction decision is restricted by some rational boundaries. The latter concept, discussed by Williamson (1979), refers to the human attitude to manipulate or hide information for self-interest. The aforementioned conditions added to the uncertainty of the market governance make the transactions more difficult, and for this reason also more costly (Coase, 1937).

Williamson (1981) extended and refined Coase's framework by defining three dimensions to evaluate the transaction. The specific economic entity will decide

to rely either on the market or on a relational contracting depending on the transaction's asset specificity, uncertainty level of the transaction and the frequency of it (Williamson, 1981).

- *Asset specificity* defines how much specific is the transaction required for the involved asset. The higher the specific investment for the asset is, the higher the transaction cost in the market governance will be. In this case, the firm, to avoid dependency to the transaction, will invest in a long relationship and a long duration of the contract (Aubert, Rivard, & Patry, 1996). On the other hand, low specificity of the asset will push the organization towards market governance.

- *Uncertainty* refers to the lack of information or the difficulty to arrange the correct and precise information to be exchanged to an external part. Also in this case the higher the uncertainty is, the higher the cost of the transaction is. Moreover, the complexity of measuring the performance of the external party during a transaction can be considered a source of uncertainty (Aubert, Rivard, & Patry, 1996).

- *Frequency* refers to the number of times the transaction occurs. In scenarios of low frequency transactions, organizations usually take the risk of suffering of opportunistic behaviors of the exchange party instead of incurring in the cost of the transaction with an external part, and go for market governance (Aubert, Rivard, & Patry, 1996). When the frequency of the transaction increases, it is more worthy for a firm to protect it by signing long term agreements.

		Asset specificity		
		low	high	
Uncertainty and measurement problems	low	market transaction	complete contract (long-term)	
	high		relational governance	internal governance
			occasional	recurrent
			frequency	

Figure 4-1: Transaction Cost Framework (Aubert, Rivard, & Patry, 1996)

Based on the studies of Williamson, and bearing in mind that the final scope of the TCE is to assess the governance structure that minimizes the cost of the transaction, the figure 4-1 defines the boundaries of outsourcing.

When asset specificity is low, pure market transaction is expected to be the most efficient form to obtain the asset.

When asset specificity increases, the two other dimensions play an important role in the assessment of the best governance structure. Specifically, internal procurement is likely to occur under high frequency and high uncertainty condition. Long contractual relationships with external actors are instead more likely to occur in all the other combinations of the dimensions that fall in between the two extremes (Aubert, Rivard, & Patry, 1996).

Resource-Based View

Resource-Based View (hereinafter RBV) has its foundation on the idea that firms may lack resources and capabilities, and it is part of the corporate strategy to assess which of them have to be developed internally and which can be acquired externally (Grant, 1991).

The RBV can be used to explain and justify outsourcing strategies, stressing the concept that outsourcing decisions are related to the resources and capabilities owned by a firm and the best way to exploit them. Accordingly, an organization can decide whether to exploit resources by extending its boundaries (vertical integration) or by defining agreements with the market (outsourcing) (Silverman, 1999) (Espino-Rodriguez & Padron-Robaina, 2006).

Combining these two perspectives, outsourcing has been explained using the competitive advantage approach: a firm has to identify its core competences and invest on them, because they provide long term competitiveness, while the rest can be outsourced (Quinn & Hilmer, 1994). This perspective has been considered limitative while applying outsourcing strategies. By assessing that, it is intended that a firm can outsource all those activities that are not core, and because they do not provide any competitive advantage, not important (McIvor, 2005). Instead, outsourced resources or capabilities have to be considered as the ones that best complement the core competences (Grant, 1991).

The uniqueness through which a resource or capability is able to provide competitive advantage can be assessed using two dimensions: specificity (Williamson) and scarcity in the market. Afterwards, as suggested by Espino-Rodriguez and Padron-Robaina (2006) this is the connection between TCE and RBV theories: if a resource is highly specific and rare, not only will it more likely provide competitive advantage to the firm that owns it, but also the cost of acquiring the asset from the market will increase. Thus, the firm is more likely to develop the activity in-house (Espino-Rodriguez & Padron-Robaina, 2006).

The table below shows a comparison between the two theories. It is important to say that the two theories are not necessarily opposed in the assessment of outsourcing decisions. On the contrary, the can be used at the same time to complement each other (Espino-Rodriguez & Padron-Robaina, 2006).

	Transaction cost economics	RBV
Unit of analysis	• Transactions	• Resources and capabilities
Behavioural assumptions	• Opportunism and limited rationality	• Limited rationality (the firm does not master everything; it will do what is determined by its organizational routines)
Analysis for outsourcing	• Specific assets and the small numbers related to the transaction. • Only individual analysis of the transactions • Frequency of the transaction	• Specific resources • Analysis of the resources as a whole • Skills and capabilities • Experience of suppliers • Analysis of complementary capabilities
Criterion for outsourcing	• Minimizing the transaction and production costs	• Observe the creation of value
Desired effect on the organization	• Efficiency. • Better economic strategy • Tactical and operational decision	• Competitive advantage • Strategic decision • Development of capabilities across organizational boundaries
Risks	• Dependence on supplier. • Hidden costs • Post-contractual threat	• Loss of critical skills and capabilities • Service provider's lack of necessary capabilities

Note: The number of variables and factors in this table is higher than in the original version.
Table adapted from Eric (2000, 216) with an increased number of factors and variables.

Table 4-1: Transaction Cost Economics versus Resource-Based View of the firm (Espino-Rodriguez & Padron-Robaina, 2006), (Eric, 2000)

As the TCE, also the RBV theory is used to define the boundaries of an organization and thus to explain outsourcing decisions. The difference lies in the perspective: according to RBV, outsourcing decisions are driven by the

ability of a resource to provide the organization with a unique competitive advantage, when exploited (Espino-Rodriguez & Padron-Robaina, 2006).

Relational View

The Relational View (RV) has been developed with the aim of overcome a limitation of the TCE (McIvor, 2005). TCE has focus on two opposite forms of governance, the hierarchy from one side and the pure market from the other (Williamson, 1979). This perspective does not assess the potentiality of the hybrid governance alternatives.

RV says that a firm can develop a combination of resources and capabilities that goes beyond the organizational boundaries in order to achieve unique competitive advantage. Specifically, the means to do that is carefully creating and managing relationships with external entities (Dyer & Singh, 1998).

RV has the foundation on the idea that two entities are in a mutual agreement because through it they may achieve better performance than if they were using other forms of governance (Goles & Chin, 2002). Under this perspective, outsourcing is not intended anymore as the externalization of only non-core and complementary activities: a firm can now access to its key resources and capabilities by defining external agreements and setting up relationships with a supplier that is able to provide the capability that the company does not have (McIvor, 2005).

As the RBV, also the RV has to be intended as complementary in the assessment of outsourcing strategy. TCE states that spanning the boundaries of an organization throughout transactions has a cost that has to be minimized in order to achieve cost efficiency. RBV goes a bit further, assessing that the combination of internal and external resources can lead an organization to create a unique competitive advantage. RV concludes stating that collaborative relationships are more likely to provide high valuable resources and capabilities that are hard and costly to imitate by the competitors (McIvor, 2005).

4.1.5 Potential benefits of outsourcing

McIvor (2005) identified the following benefits that may come from outsourcing strategies.

Cost reduction

Cost reduction is probably the most evident benefit for the organization. Firstly, suppliers can make specific investment, sharing the risk with the customers and achieving high volumes and economies of scales. Thus, the customer will benefit cost advantages. Secondly, outsourcing allows organizations to switch fixed costs into variable costs, reducing not only the costs but also the risk of the business (McIvor, 2005).

Improvements in performance

If cost reduction is the most evident benefit, performance improvement is considered by many organizations the main driver to outsourcing. Not only will the specialist provider cut costs, but it will also be able to provide a higher quality of the service. A related topic is the definition of Service Level Agreement (SLA) between the provider and the customer. SLAs define the service level required by the outsourcing organization and provided by the supplier (McIvor, 2005).

Flexibility

In the past firms were more likely to maintain internal control over almost all the activities required to run their business. According to McIvor (2005), although inflexible, this has been a successful strategy until the markets started changing rapidly and requiring shorter time to markets (TTM) due to technology diffusion and increased competition. These factors require more flexibility and higher responsiveness. As it started to be impossible for organizations to excel in all the activities that provide competitive advantage, companies began to create networks of specialist suppliers that provide higher flexibility than vertically integrated structures (McIvor, 2005).

Specialization

Outsourcing allows firms to allocate resources and capabilities and specialize in those activities that provide the higher competitive advantage, while externalizing complementary or peripheral ones. One the other side, also the supplier can leverage in this way its own specific skills and resources. Specialization allows delivering products and services with higher quality and lower costs, while still guarantees profitability to the supplier (McIvor, 2005).

Access to Innovation

"*Many organizations are reluctant to outsource because they fear they may lose the capability for innovation in the future*" (McIvor, 2005). On the contrary, according to the McIvor (2005), the creation of a network of providers is the best way to exploit and take the most out of the suppliers' innovation strategies, investment, as well as resources and capabilities.

4.1.6 Risks associated with outsourcing

McIvor (2005) also identified some risks that might come from outsourcing strategies. Next, an overview of these risks is provided.

Cost increases

As mentioned before, firms undertake outsourcing strategy to reduce costs. Nevertheless, many of them fail in understanding the complexity of outsourcing, specifically the effort and the cost of creating, managing and maintaining a long term relationship with the external entity. When organizations are not able to manage the outsourcing process, it turns out in a cost increase (McIvor, 2005).

Risk of the Supply Market

Outsource an activity or a process that has been carried out internally for long time may present two risks. Firstly, many organizations do not understand that managing an internal process is different from managing a relationship with an external supplier. This can have bad consequences in terms of costs, quality and supply failure. Secondly and directly related with the first point, when an organization enters in an outsourcing agreement, it may face the risk of over dependency from the supplier. For this reason, it is important to monitor the supply market to avoid being stuck in a relationship with unbalanced power (McIvor, 2005).

Loss of Skills

Externalization of activities may lead to loss of skills and loss of innovative spirit of the organization. This risk rises if the outsourced activity is crucial for the achievement of competitive advantage. Any organization has to keep the control over some critical resources and capabilities in order to exploit future opportunities that arise in the market (McIvor, 2005).

Organizational changes and implications

Outsourcing strategy has a huge impact on the organization at social level. Outsourcing means opening and extending organizational boundaries. For example, some crucial outsourcing strategies may turn out in a transfer of part of the staff of the firm to the supplier. Organizations that do not recognize the social implications of outsourcing while focusing only on efficiency and supply quality are more likely to fail their outsourcing strategy (McIvor, 2005).

Advantages and disadvantages of outsourcing

Potential benefits	Associated risks
Cost reduction	Cost increases
Improvements in Performance	Risk of supply market
Flexibility	Loss of skills
Specialization	Organizational implications and changes
Access to Innovation	

Table 4-2: Advantages and Disadvantages of Outsourcing (McIvor, 2005)

4.2 New Service Development

New Service Development is a complex topic of increasing interest in management literature, due to the higher importance that service industry has been gaining for the last decades in business environment.

4.2.1 Why New Service Development

The need of organizations for introducing, using and improving effective New Service Development (NSD) processes comes from increased competition in markets that are rapidly and continuously changing. In this scenario it is vital for organizations to quickly identify, develop and arrange new offerings (Voss, Johnston, Silvestro, Fitzgerald, & Brignall, 1992). Some other research has been focusing on the importance of design choices, in terms of impact on *organizational structure*, *information technology* and technological issues in general, and impact on *process formalization*, as strategic drivers that influence the capacity of a firm of successfully developing new services (Froehle, Roth, Chase, & Voss, 2000). The lack of this approach has significant pitfalls at any of the three levels of the development, strategic, tactic, operative. Among all the lacks, firms which have poor market knowledge and fail in the strategic identification of the market trends will fail in the concept generation (Froehle & Roth, 2007).

4.2.2 Literature background of NSD

For these reasons, research and literature have put much more effort in the identification of the activities and concepts related to the service development. The following step is to create a consistent structure based on those activities.

Linear models

Most of the literature provides linear models, derived from project management approaches (Froehle & Roth, 2007). As mentioned by Froehle and Roth (2007), one of the pioneers of the NSD linear models was Shostack (1984) who developed a 10-phases process. Generally, NSD linear models are composed by 4 to 6 phases: Reidenbach and Moak (1986) developed a model based on generation and evaluation of the idea, development and testing of the concept, economic analysis, product testing, market testing, and commercialization. In

their research, Voss et al. (1992) developed a NSD model including four phases: concept development and analysis, prototype service development, prototype service test and debug, and full launch of new service (Voss, Johnston, Silvestro, Fitzgerald, & Brignall, 1992).

Starting from these early structures, Britran and Pedrosa (1998) contributed with two important innovations in the NSD literature. Firstly, they developed a six phases process "*Strategic Assessment, Concept Development, System Design, Component Design, Concept Testing and Implementation, and Feedback and Learning*" with the aim to create a general model that could be used likewise for both product and service development. Secondly, they introduced the concept of feedback loops. In this way, the output of a phase is not only a result by itself, but it is knowledge that should be fed back to improve the previous phases (Bitran & Pedrosa, 1998).

Non linear and circular models

The natural evolution of the linear models with feedback loops is the NSD non linear model (Froehle & Roth, 2007). One of the first researches that critically analyze the cyclical nature of the NSD process is probably the one of Johnson et al. (2000). This research defines a model composed of four phases: design, analysis, development, and full launch. Peculiar characteristic of this model is the focus on the interdependence and cyclicality of the process design-development (Johnson, Menor, Roth, & Chase, 2000) (Froehle & Roth, 2007).

4.2.3 The Resource Process Framework

Most of the definitions of NSD as well as the different models emphasize the idea of activities, processes, stages, phases that are needed from the concept creation to the launch of the service. As suggested by Froehle and Roth (2007), literature has put much more focus on the process and the interactions of its activities rather than on the resources that are needed to support those activities along the process. Resource Process Framework (RPF) goes beyond the analysis of the sole processes, assessing that a service firm should understand how to manage its resources along the NDS process in order to exploit them and achieve sustainable innovative positioning (Froehle & Roth, 2007).

The RPF, as shown in the figure below, is a combination of the physical, organizational, and intellectual resources of a firm that are used as a support to the efforts dedicated to the NSD process.
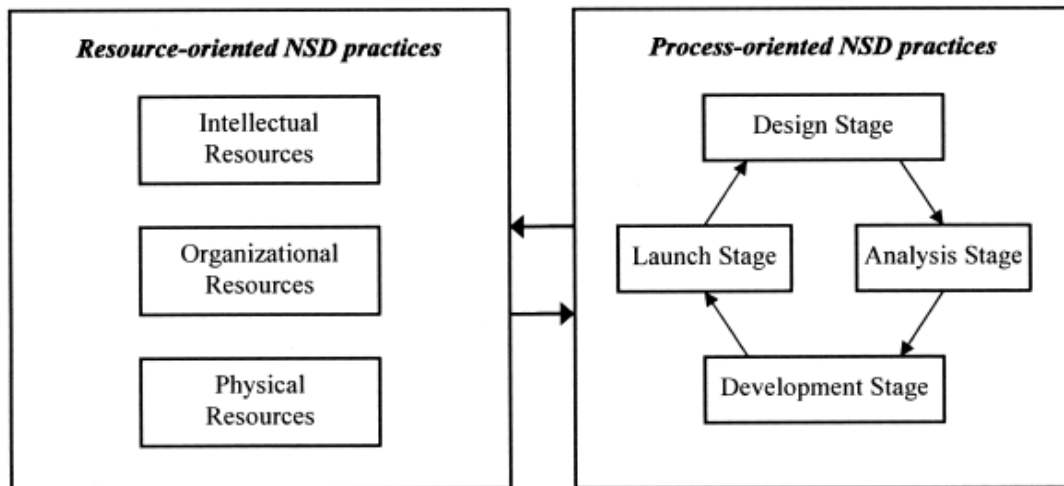
Figure 4-2: The Resource-Process Framework (RPF) of New Service Development (Froehle & Roth, 2007)

4.2.4 Resource Oriented NSD

Under this perspective, the firm is supposed to develop and use practices that allow the identification, acquisition and management of those resources, identified as intellectual, organizational, and physical, needed to develop new services (Froehle & Roth, 2007). The three classes of resources proposed in the RPF had been identified by Barney (1991) and will be briefly described in the next sections.

Intellectual Resources

This class groups all the resources that are defined as "human capital" of a firm, meaning all the skills, competences, experience and knowledge held by managers and workers of an organization (Barney, 1991). Human capital has been identified as the key resources in development processes (Froehle & Roth, 2007). Knowledge held by employees from one side, and skills and capabilities acquired as part of the learning process from the other, enable the identification, in the day-by-day work experience, of opportunities for continuous improvement (Henderson & Lentz, 1996). Moreover, according to Froehle and

Roth (2007) not only is the internal human capital a source of competitive advantage; also the external intellectual resources (i.e. suppliers, partners, customers) can provide significant contribution to the NSD. Resource Oriented practices that allow a firm to develop, manage, and maintain over time both internal and external intellectual resources seem to be fundamental to enhance the ability of an organization to undertake successful Service Development processes (Froehle & Roth, 2007).

Organizational Resources

The second class of resources identified by Barney (1991) includes the organizational ones. According to the author, organizational resources "*include a firm's formal reporting structure, its formal and informal planning, controlling, and coordinating systems, as well as informal relations among groups within a firm and between a firm and those in its environment*" (Barney, 1991). To make it simpler, he refers to all those internal systems that are used inside an organization for the management and coordination of people as well as of activities.

For example, the creation of project teams has been assessed as a key factor of success of NSD process. NSD may get benefits from project teams in two ways. Firstly, dedicated teams can focus their effort towards specific product services or development projects, increasing the efficiency of the organization and lastly reducing development time. Secondly, inter-functional teams benefit NSD processes because of heterogeneity and diversity of the involved actors, their background, knowledge, and ideas (Froehle & Roth, 2007).

Other important organizational factor is the creation of a corporate culture based on top management support to the NSD processes and effective communication within all the areas of the organization involved in the processes. The exploitation of organizational resources enables firms to undertake sustainable strategies of NSD (Froehle & Roth, 2007).

Physical Resources

Barney (1991) defines the third class of resources as physical. This class, being very generic and not specifically related to services, includes all the physical assets owned by a firm, like production facilities, technologies, equipments, and

materials. Specifically, in the case of service development, telecommunications infrastructure, IT networks, hardware and software can be considered part of this category of resources (Froehle & Roth, 2007). Technological resources are usually critical for service industry: service development and innovation can be either driven or threatened by technological innovation (Henderson & Lentz, 1996). Firms will be successful in developing new services only if they will be able to take advantages from new technologies to provide added value to services and products (Froehle & Roth, 2007).

Concluding, resource oriented perspective assesses the importance for a firm to focus on its internal and external resources, whether they are intellectual, organizational, or physical, and to be able to constantly evolve its network of resources to guarantee innovation along time (Froehle & Roth, 2007).

4.2.5 Process Oriented NSD

Process Oriented NSD perspective assesses the importance of all the phases of the process through which a firm develops a new service, comprising service creation and service implementation (Morrow & Vijayananda, 2003). To study and understand the process and its specific tasks help an organization to standardize it, replicate it and enhance continuous improvement (Froehle & Roth, 2007). As already mentioned, literature has given a huge contribution along time proposing many process-oriented NSD models. RPF proposed by Froehle and Roth (2007) adopts the four-phase model proposed by Johnson, Menor, Roth, and Chase (2000): it consists in design, analysis, development and launch. According to the author of the RPF, there are three reasons for choosing Johnson's model:

- It is the first critical attempt to highlight the cyclicality and the importance of feedback loops in the product or service development process (Froehle & Roth, 2007)
- It is simple and intuitive
- It is very general, so that it can be easily adapted to any particular industry according to the needs of the specific research (Froehle, Roth, Chase, & Voss, 2000).

This does not necessarily mean that any other process oriented model can be applied and adapted to the RPF.

Bearing all of this in mind, the next sections will briefly describe the four phases identified in Johnson's model.

Design Stage

The design stage is the phase in which the service concept is generated.

Firstly, ideas coming from different sources, may they be areas inside the organization, customers or market research, are evaluated. In this phase it is fundamental the role of marketing. The ability of a firm to continually get inputs from market researches and competence assessments has been identified as one of the most important competitive advantages in service development (Roth, 1993).

The second main activity of this stage is the definition of the objectives and goals of the offering. This includes activities as identification of the target market, service positioning in the market place, service strategy definition, down to the definition of operational and financial performance goals (Froehle & Roth, 2007). Finally, in this phase it may be included a preliminary test of the concept of the service, either by involving external sources (i.e. customers) or testing the validity of the concept internally (i.e. cross-functional areas discussion) (Froehle & Roth, 2007).

Analysis Stage

According to Froehle and Roth (2007), in this phase the firm undertakes a formal analysis to assess the feasibility as well as the potentiality of the service concepts. It is the opportunity for the organization to make a critical evaluation of those concepts that have been identified in the previous phase. From one side, the potential performance from strategic, financial and market perspective have to be assessed; from the other side, consistency and alignment of the service objectives with the organizational overall strategy have to be assured (Froehle & Roth, 2007). According to the cyclical structure of the model, this phase may have an impact in the previous one and may lead to a partial change of the scope of the project. In the case the service concept results to be

potentially successful, the project formally receive the authorization to carry out all the activities required to move from the concept to the final launch of the service in the market.

Development Stage

This phase includes all the activities that are needed "*to convert the initial concept into a viable, marketable new service offering*" (Froehle & Roth, 2007). The effort is put on the exploitation and improvement of the resources as well as the practices that are needed to carry out the NSD process. Engineering of a service prototype and market testing are two important activities that are carried out in this stage. Furthermore, not only should the firm focus on development practices, but also start planning the delivery phase and all the activities related to market launch (Froehle & Roth, 2007). In other words, the organization has to prepare the internal resources, systems and people, to the administrative and commercial activities that enable delivery and support of the new service in the market.

Launch Stage

The last stage identified in Johnson's model is the launch. It consists of all the activities and practices that allow a company to bring the offering of the new service to the market place. This phase should focus on three main aspects.

Firstly, the organization should address his effort to marketing activities as well as training programs for the customers and also for the internal areas that might be somehow affected by the launch of the service (Froehle & Roth, 2007).

Secondly, firms must implement systems and practices to collect data and information from customers. According to Johnson, Menor, Roth, and Chase (2000), customer feedback is a key aspect of NSD process. From one side it allows to assess whether the service is actually able to provide exactly what had been planned in the design phase, from the other side it makes easier to identify possible uncover lapses of the offering.

Finally, at the end of this stage, it is of vital importance to undertake a post-launch analysis to evaluate the performance of the NSD process as well as of the marketing efforts (Froehle & Roth, 2007). This is the most effective way to

provide feedbacks to NSD process enhancing continuous improvement of the same.

As already mentioned, the aforementioned phases create the general structure of the NSD process. For the sake of simplicity, they are described as they were part of a linear process, but it is important to bear in mind the vital role of feedback loops that allow firms to continuously improve their NSD efforts (Froehle & Roth, 2007)

4.2.6 Managing risks in NSD

The rapid evolution of technology has changed dramatically the business environment, especially in the service industries. Customers are more demanding and difficult to retain, needs are continuously evolving and changing, and regulatory changes in the industries changed the competitive landscapes increasing competition (Ahn & Skudlark, 2002). All of these factors contributed to create new challenges for firms, which are required to implement faster, more efficient and more flexible NSD processes to be successful in the marketplace (Ahn & Skudlark, 2002). According to Ahn and Skudlark (2002), challenges of this new business environment are clear: the described uncertainty creates the risk that firms' plans will not work exactly as it had been planned and the output of the process has not the desired value. Besides the challenges, uncertainty creates also opportunities to gain advantages over the competitors. Understanding uncertainty of NSD process is the way to deal with it. Many practices have been developed to manage new service and product development processes, like the already mentioned linear and non linear stages models, the creation of cross-functional teams, and the creation of a product manager. According to Mullins and Sutherland (1998) these tools are good for managing the service or product development processes but not for dealing with uncertainty and risk, especially in the preliminary phases of the process. Firms should implement a method that must be able to catch insights of how the business environment may evolve, to identify the most important factors that drive the evolution, and to assess how the organization might cope with it (Ahn & Skudlark, 2002).

Scenario Planning

Scenario Planning is a useful and relatively simple approach to identify uncertainties and risks associated to NSD to allow an organization to deal with them, especially in the early phases of the project (Ahn & Skudlark, 2002). Scenario Planning is not a practice to reduce or eliminate uncertainties; it is a tool that helps an organization in understanding uncertainties and risks. In order to deal with uncertainty, specific risk management strategies have to be developed and carried out inside the organization (Jennings, 2000).

Many scenario planning methods have been suggested by the literature along time, many have been adapted to specific industries. Generally speaking, scenario planning methods follow a four-stage process that consists in defining the scope, collect valuable information, building scenarios, and finally choosing strategic options (Schoemaker, 1995) (Ahn & Skudlark, 2002).

4.2.7 NSD for IP based services

Using the existing literature on NSD, the existing models have been adapted to the NSD process of telecommunication service industry. Specifically, based on the idea that NSD includes both the processes of service creation and service implementation, Morrow and Vijayananda (2003) proposed a process-based model that consists of seven phases, identifying six tollgates to get to the final phase of Service Launch (Morrow & Vijayananda, 2003). The model will be described in the following section.

Service Development Process

As already seen, NSD process consists in a series of stages, or sub-processes, each one having inputs and outputs, and in each stage it is required to pass through a tollgate in order to move forward to the next phase. The figure below depicts the NSD process, with related phases, outputs and tollgates.
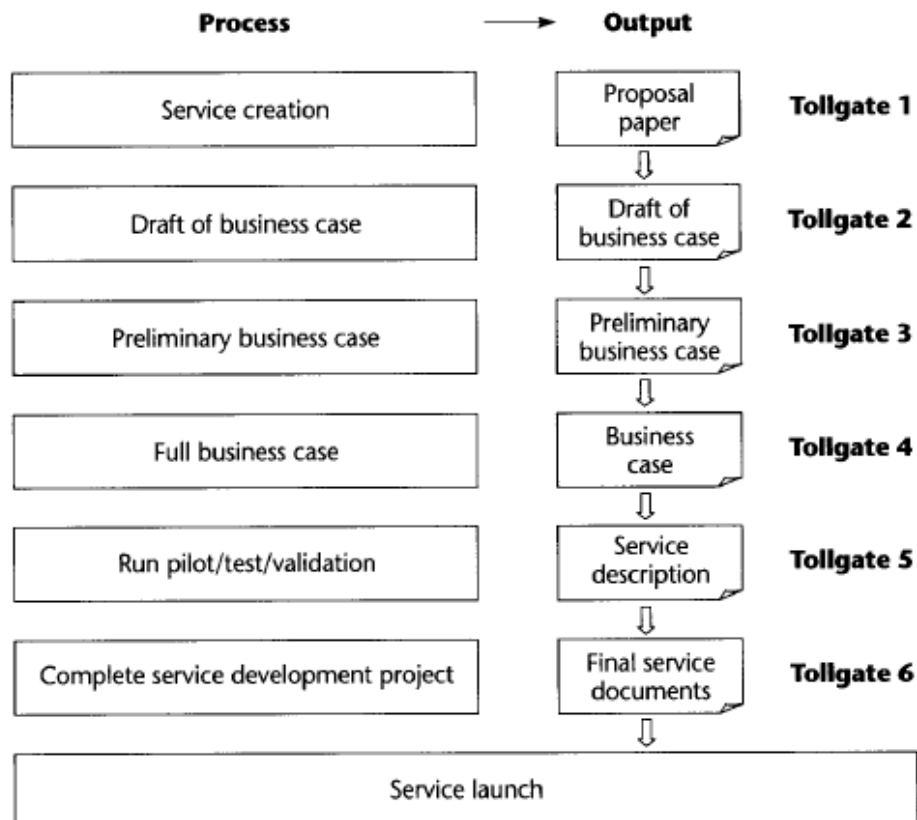
Figure 4-3: IP based Service Development Process (Morrow & Vijayananda, 2003)

- **Service Creation**. In this phase a proposal of service idea is presented. The idea has to be consistent with the product portfolio of the company. Firstly, service cannibalization, defined as the potential "*erosion of an existing service as a result of introducing a new one*" (Morrow & Vijayananda, 2003), has to be avoided. Secondly, the service has to be positioned in the market (service positioning), to show that an opportunity for this service in the market exists.

- **Draft of the Business Case**. The proposal of the service idea is the input for the second stage of the process. This phase consists of a technical feasibility of the project. In other words, it has to be assessed whether the technology required by the new service is available or not (Morrow & Vijayananda, 2003).

- **Preliminary Business Case**. This phase should include an extended analysis of the proposed scenario. Competitive analysis, for example through a SWOT (Strengths, Weaknesses, Opportunities, and Threats)

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analysis, identification of commercial and operational goals aligned to the strategy should be part of the draft of the business case (Morrow & Vijayananda, 2003).

- **Full Business Case**. This is, according to Morrow and Vijayananda (2003), the most critical phase of the NSD process. The analysis developed in the preliminary business case will serve in this phase to answer questions as "*why the company will develop the service, what tools are necessary for service development and how the service will be developed and with what resources*" (Morrow & Vijayananda, 2003). The final objective of this phase is to identify, through the business case, the risks associated with the development and deployment of the new service. According to the author, the business case has to show the potential attractiveness of the new service, compared with the risk associated to the development process. Moreover, this phase must also provide the structure for the implementation of the pilot test, consistently with what has been identified in the business case (Morrow & Vijayananda, 2003).

Business Case Factors	
Element	**Description**
Why develop the service?	
Issues	Identification of customer impact
Business Architecture	Participants, their roles, processes they perform
Benefits	List of qualitative and quantitative benefits (for service provider, customers, and partners)
Business Opportunity	First quantitative assessment of the business potential
What tools are necessary?	
Technical IT architecture	Which applications and activities are required; indication of the level of modifications to the system environment
Organizational chart for implementation	Who is required to participate for a successful service development
Competitive analysis	Brief overview of competitors
How will the service be developed?	
Resource requirements and plan	Project time schedule, Resources
Partnership concept (optional)	Strategic customer relationship
Risk assessment	Business impact (including the case of not delivering in time)
Financial model	Includes revenue drivers, revenue, profit, net present value

Table 4-3: Business Case factors in IP based NSD process (Morrow & Vijayananda, 2003)

- **Run pilot/test/validation**. Having received the structure of the pilot test as input from the previous phase, the pilot test is implemented with a pilot customer. All the required resources are exploited here for the first time, risks related to the implementation are identified along the process, and service delivery process is defined, as well as the financial model to identify costs and prices of the service. Finally, SLAs are defined according to the results of the test. New service trainings to the involved areas of the organization might be undertaken at the end of this phase (Morrow & Vijayananda, 2003).

- **Complete service development process**. This phase consists in two main activities. Firstly, sales and marketing plans that are required to launch the service have to be finalized. Secondly, all the technical, commercial and contractual documentation has to be developed in this stage (Morrow & Vijayananda, 2003).

- **Service Launch**. When all the areas of the organization are trained and the documentation is ready, the service can be launched in the market.

Service Life Cycle

One of the biggest mistakes of a service firm is to think that the service management after the launch is the last phase of the service life cycle. Service life cycle is drafted as a circular process which includes *service enhancement* and *service retirement*. One fundamental task of product management is to lead the service along its life cycle after the development process (Morrow & Vijayananda, 2003).

Service enhancement consists in the development and introduction of new features as part of the service. Service enhancement can be carried out as a specific project which maintains the general structure of the NSD process, although not the entire NSD process is necessary. The objective of enhancement is to exploit the service along its lifetime, possibly stretching it as most as possible by adding features that add value to the whole service (Morrow & Vijayananda, 2003).

When a service stops being a value added offering and becomes a commodity, the organization should start to plan the retirement of it from the market and from the product portfolio of the company. When a service becomes a commodity, the only differentiation is price. Market dynamics based on competition will then lower the price progressively reducing the profitability of the service for the organization (Morrow & Vijayananda, 2003).
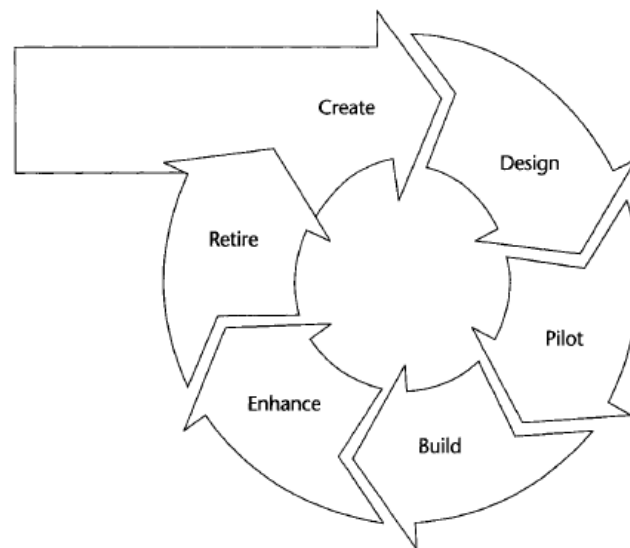
Figure 4-4: Service Life Cycle (Morrow & Vijayananda, 2003)

The Value Chain

NSD is a complex process that goes beyond the boundaries of the firm. Other organizations are more or less directly involved in the process and the interactions between these actors determine the success or the failure of the project (Morrow & Vijayananda, 2003). Along the value chain, and besides the service provider, two are the main players involved: Vendors and Customers[2].

Services are to be sold to customers, so they must be developed in order to satisfy customer's needs. It is usually the customer who drives the requirements and features for the service, according to the so called market-pull perspective.

Vendors are all the technology providers, who supply technological products that will be used by the service provider to develop and deploy the service. Customer final aim for a service is to reduce OPEX (i.e. operational costs), so

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[2] Although the structure of the value chain reflects the typical provider -> firm -> customer model, the mentioned value chain and the related nomenclature is specific for telecommunication industry and cannot be easily generalized.

service provider and vendors can play an important role in technology innovation and technology standards, to drive changes in the requirements of the customer (Morrow & Vijayananda, 2003). In this case, the perspective is market-push.

As mentioned, the interaction between these three actors is fundamental for the success of the process. Service provider has to understand perfectly the commercial and operative requirements of the customer, and transfer them to the vendor in the form of technological requirements (Morrow & Vijayananda, 2003).

The participants of the NSD[3]

From an internal point of view almost all the departments of the organization are involved in the NSD process. Some of them play a direct role, some others are secondary.

Sales and Marketing department studies market trends and understands the requirements of the customers. These requirements have to be communicated as input of the NSD process (Morrow & Vijayananda, 2003).

Product Management is in charge of leading each specific product or service through the NSD process and through the whole service life cycle. Product Manager should have the whole vision of the service and look at it from a profit and loss perspective (Morrow & Vijayananda, 2003).

Engineering Department is in charge of the technological issues. In other words, it assesses the technological feasibility of the commercial requirements and defines the architecture of the service (Morrow & Vijayananda, 2003).

Financial department gives accounting support to all the areas involved in the NSD process. HR is for example an issue for financial department in NSD process, which has to allocate the costs of the activities. As HR, all the other departments have to be taken into account. For this reason, financial

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[3] Contrarily to the value chain section, the schema and the description of the internal actors of the NSD process, though referred to telecommunication industry, might be generalized to any service industry.

department might direct changes in process management (Morrow & Vijayananda, 2003).

Operations department is in charge of implementation and configuration of the service. This department also controls the implementation and maintenance of all the IT activities that are related to service (Morrow & Vijayananda, 2003).

Finally, "*Service Management is responsible for customer support, help desk, and call center functions*" (Morrow & Vijayananda, 2003). Service Manager is responsible of post sales activities and management of the service through the committed SLAs and related measurements.

4.3 Telecommunication Services Business Models

Business Model is a wide topic which has been largely discussed by business and managerial literature along time. The first part of this section will introduce the concept of Business Model and related definitions, while the second will focus on the characteristics of IP based Business Models.

4.3.1 Business Model definitions

Paul Timmer (1998) has been one of the first to give a definition of Business Model and to suggest a classification. According to him, many aspects have to be considered while defining a Business Model: "*an architecture for the product, service and information flows, including a description of the various business actors and their roles; a description of the potential benefits for the various business actors; and a description of the sources of revenues*" (Timmer, 1998).

Similarly, business model has been defined as a set of actors, namely the firm and its customers, suppliers and customers, who have specific roles and relationships and interact within each other. These interactions determine three main flows of products or services, information and money. The final aim of the actors is to create value along the value chain, and the business model has to describe how to create this value and how each actor can benefit from it (Weill & Vitale, 2001).

Stähler (2002) defines a business model as the simple description of a complex reality. By describing in a simple and structured way all the business elements and the related interactions, the business model helps to identify how the firm responds to the real business environment and to assess how the business should be or evolve.

As mentioned by Wulf and Zarnekov (2009), an important contribution to business model literature has been given by Osterwalder and Pigneur (2002). To describe a Business Model they define four pillars:

- **Product Innovation**: it is related with the offering of a firm as a whole, like the core capabilities held by the organization, the value proposition and the target market or customer to which this value proposition is addressed (Osterwalder & Pigneur, 2002).

- **Infrastructure Management**: it includes all those elements that contribute to the value creation, like the allocation of the resources held by the firm, the configuration of the specific value system, and the identification of partner networks (Osterwalder & Pigneur, 2002).

- **Customer Relationship**: it assesses how the firm reaches the target market and its customers. Moreover, it defines how the firm should retain customer increasing the customer life value. Fundamental parts of this pillar are the definition of information strategy and the identification of distribution channel (Osterwalder & Pigneur, 2002).

- **Financial Aspects**: the last pillar defines the financial structure of the firm as part of the whole value chain, and it is basically composed of three elements: revenue model, cost structure and profit model (Osterwalder & Pigneur, 2002).

4.3.2 Business Model of IP based Services

Using Timmer's and Osterwalder's theories on business models, Wulf and Zarnekov (2009) developed a framework which includes all the general characteristics of a business models for IP based distribution of services. Among all the aforementioned aspects, they identified some that are fundamental for the specific purpose.

- Value proposition
- Value chain activities
- Roles in IP based distribution
- Technological resources
- Revenue model and cost structure.

One important aspect that has not been included in the framework is the customer relationship management. The authors, though considering it very important in the business model definition and implementation, believe that it is a topic with high specificity, meaning it is almost impossible to be generalized and included in a general framework (Wulf & Zarnekow, 2009).

A brief description of the aforementioned pillars will be given in the next sections.

Value Proposition

In product industries, the most general value proposition of distribution has been defined along time as "*deliver the right goods at the right time in the right amount and quality*" (Schulte, 1995) while considering the trade-off between distribution costs and the quality of the delivery service (Wulf & Zarnekow, 2009). In the same way, the objective of IP based distribution of service is to guarantee information delivery with an acceptable level of service quality. Thus it is not always easy to generalize the concept of quality of an experience; a set of technical SLAs has been defined in IP distribution of service, in order to allow the customer to perceive the service quality. These characteristics are called *Quality of Service* (QoS), and they are explained in the following table:

Quality of Service in IP based distribution

Bandwidth	The maximum volume of data per time unit being transmitted over a particular network connection.
Delay	The length of time that a data package takes from the sender to the recipient.
Jitter	The fluctuation in the delay.
Packet Loss	The number of data packets that are lost in the transmission from the sender to the receiver.

Table 4-4: QoS in IP based distribution of Services (Wulf & Zarnekow, 2009)

According to the authors and to the mentioned definitions, "*the right time in IP based distribution is determined by bandwidth, delay and jitter, the right amount and quality of a good is influenced by the packet loss*" (Wulf & Zarnekow, 2009).

Value Chain Activities

Even in this case, to identify the appropriate architecture of business models, it seems to be necessary to distinguish between traditional distribution of physical goods and delivery of information contents. For traditional products, the activities identified along the value chain are warehousing, consignment, packaging, shipment, and transportation (Schulte, 1995) (Wulf & Zarnekow, 2009). Information goods have different characteristics which affect the

activities along the value chain for IP based services. Wulf and Zarnekov (2009) presented a model which consists of service production, hosting, transport, and finally consumption. The mentioned model is shown in the following figure:

Pre-Distribution | **Distribution** | **Post-Distribution**

Service Production
(Creation, Aggregation and Packaging)

Hosting
(Storage, Internet Feed)

Transport
(Transit and termination)

Consumption
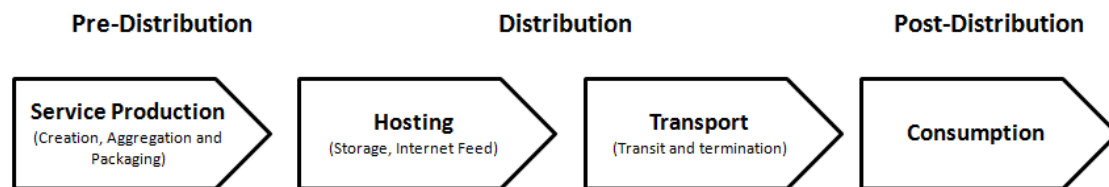
Figure 4-5: Value Chain for Internet Distribution (Wulf & Zarnekow, 2009)

For the sake of this study, only hosting and transport will be briefly mentioned. As the cost and time of reproducing information once it has already been produced is negligible, warehousing is not a necessary activity. Information goods are virtually stored in servers and, when requested, they are packaged and sent into the IP network (Wulf & Zarnekow, 2009). Also transportation activities differ from traditional physical products delivery. Specifically, according to Wulf and Zarnekow (2009), there are two factors that affect these activities along the value chain: firstly, information goods, differently to physical ones, are requested, sent, and consumed simultaneously; secondly, IP networks have a higher complexity in their structure than physical networks used in traditional logistics. For these reasons, route optimization, both between networks (transit) and in the end customer (termination), has a higher priority here than in traditional logistics (Wulf & Zarnekow, 2009).

Roles in IP Based Distribution

There are different actors who play different roles along the IP distribution value chain (Wulf & Zarnekow, 2009). The following table summarizes the roles of the main actors:

Roles in IP Based Distribution

Content Providers (CP)	Create, aggregate and/or package information goods (information services, enterteinment services, B2B communication services, etc.).
Network Service Providers (NSP)	Operate IP networks and offer network access to CPs, HPs as well as to ECs.
Hosting Providers (HP)	Operate servers and make content accessible from IP networks.
Content Delivery Network Providers (CDN)	Manage content distribution over a network of hosting servers applying technologies such as caching and route optimization.
Distribution Software Providers (DSP)	Develop peer-to-peer (P2P) software for a client side optimization of content distribution.
End Customers (EC)	Acquire access to IP networks from NSPs.

Table 4-5: Roles in IP Based Distribution Value Chain (Wulf & Zarnekow, 2009)

Technological Resources

Other important pillar of business models in IP based distribution industry is the set of technological resources that are required along the whole value chain. As a whole, IP distribution is based on technological infrastructure like networks, equipments to store information goods, processing capacity, and software (Wulf & Zarnekow, 2009).

For the sake of this study, the focus will be put on technological infrastructures. Communication network infrastructure allows the physical transmission of the data, through wireline and/or wireless networks (Wulf & Zarnekow, 2009). According to the authors, transmission of data can be carried out either using dedicated capacity or peering agreements like the Internet. In the first case, the transmission is much more efficient and a higher QoS can be provided, but dedicated capacity needs additional routing protocols and practices as well as specific systems for capacity management. On the contrary, the Internet is a network which uses best effort practices to route information traffic (Wulf & Zarnekow, 2009).

Revenue Model and Cost Structure

The last pillar of Business Models involves economic flows which generate financial flows. In other words, the flow of goods, in this case the distribution of

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information, generates revenue streams. Revenue Models have been classified as transaction based and non transaction based. In the first case, revenues are directly collected along the single interaction between the two involved entities (Wulf & Zarnekow, 2009). Another classification of revenue models distinguishes between direct revenues and indirect revenues. In the first case, the transaction directly involves the end customer, who is directly charged. In the latter case, "*revenues are drown from a third party*" (Wulf & Zarnekow, 2009).

To conclude, financial pillar of business model must include the cost structure, which Wulf and Zarnekov (2009) define as "*all the costs which are incurred by a company to conduct service delivery*", in this specific case to provide the distribution of information goods. Besides all, there are two classes of resources which have, for different reasons, a relevant impact on the business cost structure. Firstly, network infrastructure has to be built, maintained and improved along time. Network infrastructure management is capital intensive and requires large OPEX. Secondly, distribution applications which provide bandwidth and routing optimization, though not cost intensive by themselves, might have a huge impact on QoS, thus indirectly on the cost structure (Wulf & Zarnekow, 2009).

5   Theoretical Framework and Research Methodology

This chapter represents the logical connection between the literature review and the empirical study. The chapter is divided in two parts. In the first section it will be presented the theoretical framework developed by the author accordingly to the previous literature review. The framework will be functional to the empirical study and it will allow the author to answer to the research questions previously defined. In the second section of the chapter, the methodology used by the author to guarantee scientific validity of the study will be presented.

5.1   Theoretical Framework

After a detailed literature review on the three main topics covered by this study, a theoretical framework has been developed with the aim of identifying those models that best fit the phenomenon. Within the identified models, a set of variables has been defined to facilitate the analysis and to come up with an empirical solution to the problem.

The theoretical framework is composed of two main parts, each addressing two separate issues. In the first part of this research, TCE and RBV are applied in an integrative framework to understand the reasons why local telecommunication network and service providers are outsourcing activities to international service providers. Specifically, the author applies RBV to address the questions related to the strategic importance of those activities, assessing whether they are core competences of the firms or not. By contrast, TCE will assist in assessing whether economic advantages are actually achievable by outsourcing activities.

In the second part, the author uses the RPF proposed by Froehle and Roth (2007) to analyze all the activities that had been previously identified as part of the new business model of managed services. A set of variables will be identified for each of the seven categories proposed in the RPF with the aim to

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identify the impact that those new activities have on the NSD process of international service providers.

In the next section, the author will go into the details of the framework and the related variables.

5.1.1 RBV and TCE framework

Within the theories related to outsourcing that have been explained in the literature review, RBV seems to be the most appropriate to understand the reasons why telecommunication local service providers and operators have been outsourcing some of their competencies to international and global service providers. The main principle of RBV is that the firm can be conceived as a business entity which owns resources and capabilities and has to take strategic decisions on their exploitation in order to achieve and maintain competitive advantages (Barney, 1986), (Wernerfelt, 1995). Furthermore, it seems to be consistent with the specific environment presented in this analysis, where outsourcing does not occur between two totally independent entities but between firms that belongs to the same group. RBV then allows making an integrated analysis considering both the perspective of the firms of the group that are outsourcing activities to the international provider, and the perspective of the international provider which is internalizing those activities that are part of its core business.

In order to make this first part of the framework more comprehensive, TCE has also been included, though with less emphasis and contribution. Since RBV's unit of analysis is typically the firm and its resources and capabilities, this perspective falls short of considering the connection between the two entities involved in the phenomenon of outsourcing (Espino-Rodriguez & Padron-Robaina, 2006). To enhance author's perspective to include both parties of the relationship and the transactions associated, a TCE viewpoint (Williamson, 1979) has been added to the initial framework.

The author decides to focus on RBV and complement it using TCE because of the specific context of the study. As already mentioned, the specific phenomenon that has been studied occurs between firms which, while still

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being independent entities, belong to the same group. On the other hand, other theories like relational ones, assume a different perspective. Specifically, they assume that firms act as totally independent entities when deciding to go for outsourcing for strategic reasons (Dyer & Singh, 1998), thus overlooking the specific relational dynamics of firms belonging to the same group, which is instead this case. In facts, in this research setting each single firm's strategy may very well be influenced by the group's overall strategy and decisions, which cannot be accounted for when using the perspective of analysis of these theories.

Having defined the RBV as the base and TCE as the support theories to the first part of the framework, in the next paragraph the most important variables identified in the literature will be first briefly described and then selected according to the specific context of this study.

Identification of the variables

The issue of outsourcing was studied by Quinn and Hilmer (1994), who, besides the typical variable of core competencies defined another dimension of analysis which they refer to as "*degree of strategic vulnerability*". The authors proved that even certain core competencies and activities might be outsourced if it is possible to reduce the strategic risk of the externalization by means of long-term relationships or temporal consortia (Quinn & Hilmer, 1994).

Murray et al. (1995) made an empirical study to assess the relationship between outsourcing and organizational performance, and besides the core competence, they included in their framework some variables of the TCE: specificity of asset and frequency of transaction. They also included product and process innovation as dimension of analysis, finding a negative relationship between outsourcing of innovative activities and organizational performance (Murray, Kotabe, & Wildt, 1995).

Argyres (1996) did not limit the analysis to the firm which takes the outsourcing decision; instead, the author extended the analysis to the suppliers, including in the framework not only the firm's capabilities but also a variable to assess the suppliers' capabilities. According to his study, a firm may decide to go for outsourcing even if the related transaction costs are high provided that the

provider/supplier has superior capabilities (Argyres, 1996). An interesting sub-dimension of this variable is the intellectual resource of the supplier: if an activity requires tacit knowledge, it is more likely that the firm will outsource if it takes time and effort to internalize that knowledge (Argyres, 1996).

Poppo and Zenger (1998), besides the already mentioned dimensions related to RBV and TCE (i.e. specificity of resources and core competencies intended as the magnitude of skills that provide competitive advantage owned by a firm) introduced another variable which is "economy of scales". According to the authors, this variable may be used both for RBV and for TCE. They find that firms that possess the capabilities and the resources to achieve economies of scales are more likely to develop activities in-house. On the contrary, if suppliers may achieve those economies of scales, firms are more likely to externalize the related activities to minimize transaction and production costs (Poppo & Zenger, 1998).

McIvor (2000) uses in his conceptual paper the same variables of core and non core activities as well as internal and external capabilities to study the relationship between firm and potential suppliers in the perspective of the value chain. He links the outsourcing decision to the corporate strategy. Like McIvor, Gilley and Rasheed (2000) introduced in their RBV framework a variable regarding organizational strategy. This variable is directly related to the generic strategies of Porter. The author finds a positive relation between outsourcing and business performance of organizations which follow a cost leadership strategy. The relation is instead negative when the organization follows a differentiation strategy (Gilley & Rasheed, 2000).

Taken together, these contributions offer an important set of relevant variables to explain outsourcing decision within a RBV framework. The theoretical framework is based on a subset of the before mentioned variables, namely:

- **Core competences**. Following Quinn and Hilmer (1994), core competences are defined not only as the ability to make a product or a service relatively well, but as the activities that a firm is able to perform better than its competitors, thus enabling it to achieve competitive advantage.

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- **Suppliers' capabilities**. This variable is generally considered as a driver of outsourcing (McIvor, 2005), (Argyres, 1996). For instance, according to Argyres (1996), outsourcing is more likely to happen, and management is more willing to go for it, if the suppliers are known to have better know-how in providing the same activities.

- **Asset Specificity**. Previous literature using a TCE perspective, defines that an asset is specific when it needs non re-deployable physical or human investments that are specialized for a unique task. Authors that used RBV perspective have proved that the higher the specificity of the asset, the worse will be the performance of the activity, if outsourced (Murray, Kotabe, & Wildt, 1995) (Poppo & Zenger, 1998).

- **Economies of Scale**. It is intended as the capability of an organization to concentrate activities (and resources) to achieve internal scale of production, thus cutting costs and providing the activity at lower prices.

- **Organizations' strategy.** As already mentioned, Gilley and Rasheed (2000) found a positive relation between outsourcing and business performance of organizations which follow a cost leadership strategy. The relation is instead negative when the organization follows a differentiation strategy (Gilley & Rasheed, 2000).

5.1.2 Resource Process Framework

The second part of the framework is based on another framework that has been developed by Froehle and Roth (2007) as part of their empirical study on the New Service Development. Most of the literature on NSD usually focuses on the process perspective dedicating less importance to the resource (Froehle & Roth, 2007). The literature review of this study includes both the perspectives, supporting the idea that a comprehensive analysis should not forget the importance of the resources that are required in the NSD process. Within the literature, the framework provided by Froehle and Roth (2007) seems to be the one which best fits the needs of this study, whose last aim is to assess the impact that all the activities identified in the first part of the framework have on the processes and on the resources on the NSD in telecommunication industry.

The difference between the resource-process framework (hereinafter RPF) of Froehle and Roth (2007) and the RPF used in this study lies in the scope. The RPF has been built "*for organizing the various organizational practices and activities related to NSD*" (Froehle & Roth, 2007). Using this structure, the related constructs identified in the literature will be used as variables of analysis for this study.

The framework is divided in two parts, the one which focuses on the resource based practices and the other which focuses on the process based practices. Variables are identified for each of the 3 subcategories of the resource based framework as well as for each of the 4 subcategories of the process based framework. The constructs used in the RPF as well as in this analysis have been selected from the literature and will be briefly explained in the following section.

Processes

Design Stage

Cooper et al. (1994) have focused their research on the customer interaction in the first stages of the NSD. *Customer focus* is intended as the impact that the new service has on the meeting of customer need, both from a technical and commercial perspective. Bitran and Pedrosa (1998) have talked about customer input as the influence that customers play during the initial conceptualization, and in the same way Edvardsson and Olsson (1996) took the perspective of partnerships and alliances assessing their impact on the service development.

Bitran and Pedrosa (1998) also mentioned the *strategic definition* as a relevant dimension of this phase of the service development process. An effective practice is to define and communicate the strategic objectives of the new service, and the same dimension might be used to assess the consistency between the activity and the strategic objectives of the service. In other words, it is necessary at this level to ensure the concept is aligned with the general scope of the service.

Analysis Stage

Edvardsson and Olsson (1996) maintained the market perspective also in studying the analysis stage of the NSD. They identified practices based on

competitors' analysis and *market research*. Specifically, they proved the importance of an analysis of competitors' strategies and offerings when evaluating the viability of the activity to be developed. It is possible in this way to evaluate the impact that the development of a specific activity has on the NSD process, intended as what the market requires and what the firm is currently offering.

Cooper and de Brentani (1991) defined as dimension of analysis of the NSD process the *financial impact* of the development of a new service, activity or functionality. The financial impact is the output of a financial analysis that is necessary to define the financial or economic viability of the activity (Cooper & de Brentani, 1991). It gives an inch on the financial effort that the organization has to undertake during the NSD process and it is directly related to the financial resources of the firm.

Development Stage

Froehle and Roth (2007) have identified a dimension of analysis in this phase, which is directly linked with the physical (i.e. technological) resources owned by the firm. *Technology development* aims to assess the technological impact that the development of the activity has and can be operationalized as the gap between the existing systems and the desired ones (Froehle & Roth, 2007): the higher the gap, the higher the impact on the development.

Following the same reasoning, Cooper et al. (1994) as well as Edvardsson and Olsson (1996) mentioned in their studies the importance of *staff training* and its impact on the NSD. Bitran and Pedrosa (1998) included *staff recruiting* as alternative to staff training, when the firm lacks of the needed human resources. In general, this variable aims to identify the requirements for human resources (to be trained or hired) of the different areas of the organization that will be affected by the new service.

Launch Stage

Cooper and de Betrani (1991) studied the importance of developing and implementing specific and detailed internal programs for the *standardization of the launch* of new activities or services. Morrow and Vijayananda (2003) used a NSD process for telecommunication services where they identified *training programs* for the launch of the service to the different areas of the firm. Not all

the activities or functionalities of a service require the same effort in standardization of practices, and this dimension can be used to evaluate the impact on the NSD process (Bitran & Pedrosa, 1998).

Edvardsson and Olsson (1996), as well as Bitran and Pedrosa (1998), identified another fundamental practice which is *customer training*. Customer training is essential for the success of the service and the impact on the NSD process might be defined as the amount of resources and the effort that a firm must dedicate to the first approach with the customer while launching the specific service or functionality.

Resources

Intellectual

Diverse creativity has been defined as the practice to cultivate and utilize a wide mix of intellectual sources for the generation of ideas as well as for implementation of the NSD (Loch, Stein, & Terwiesch, 1996). In order to evaluate the impact on the intellectual resources in NSD, this dimension has been used as variable of analysis to identify the intellectual resources (technical/technological/commercial knowledge and background of the involved actors) required for the development of the activity. It is directly related to *Strategic Definition* and may affect also *Staff Training*.

Organizational

Organizational resources work as the link between intellectual and physical resources. "*Organizational resources are the management systems, attitudes, and personal relationships adopted and developed by the company*" (Froehle & Roth, 2007). They allow the interaction between intellectual resources and support them in the effective exploitation of the physical ones.

Voss et al. (1992) defined internal communication as the set of practices that ensure an effective communication between the different functional areas that are involved in the NS It is possible to extrapolate from this dimension a variable of analysis to assess the level of communication and cooperation that the different areas involved in the development have to maintain. It affects the variables *Staff Training* and *Launch Impact*.

Cooper and de Brentani (1991) included in their analysis another dimension which is the *managerial support*, intended as the level of management involvement required in the development. It is directly related to *strategic definition*, and it is particularly useful for those activities that have a high strategic impact on the firm as well as on the NSD.

Physical

Bitran and Pedrosa (1998) proved the importance of providing the appropriate technological resources that are needed to the successful development of the activity. Froehle et al. (2000) included in their analysis a similar dimension with the aim to ensure that the existing IT systems are compatible with the requirements of the new activity. The operationalization of this dimension into a variable of analysis is defined as the technological gap to be covered to allow the efficient development. It is directly related to *technology development* and to *staff training*.

The following figure shows the variables of each subcategory as well as the relations between them.
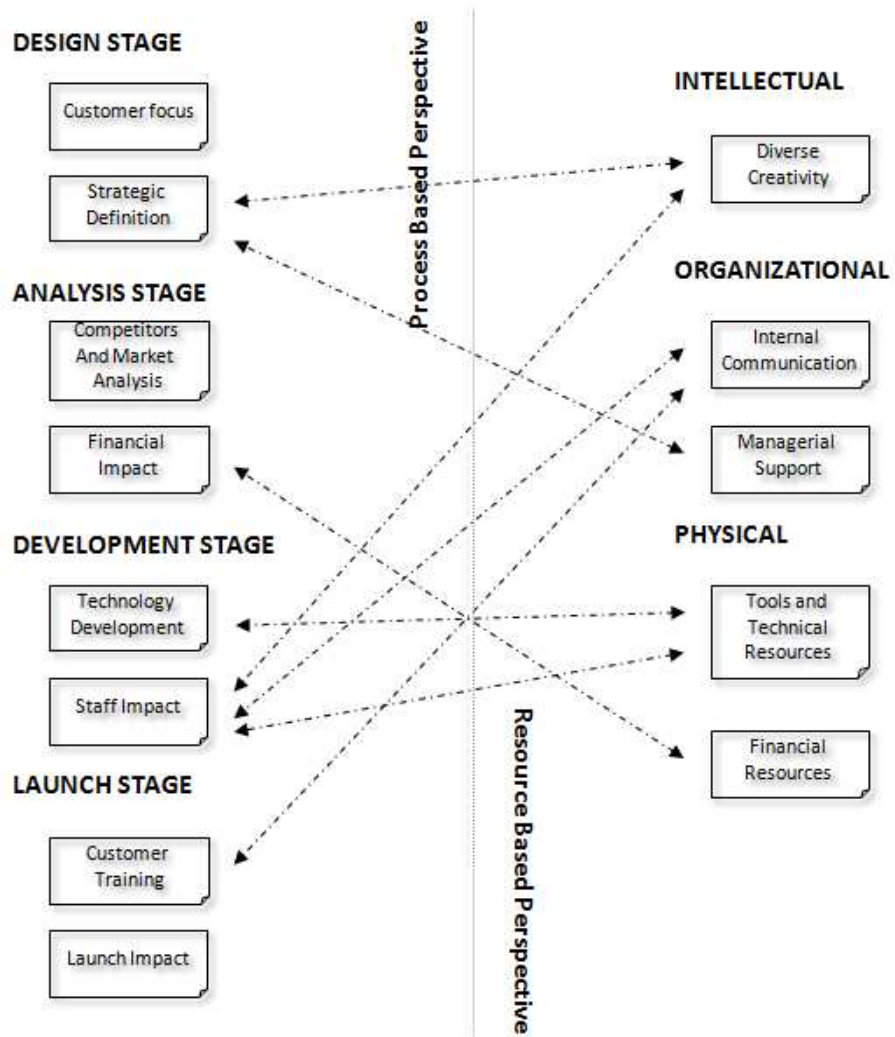
Figure 5-1: Graphical representation of the variables of the RPF and their relations. Adapted from (Froehle & Roth, 2007)

5.2 Research Methodology

This section will go through the definition and description of the research methodology that has been used by the author to carry out this study and consequently this Master Thesis. Firstly, the two main paradigms of scientific research will be presented justifying the choice of one with respect to the other for this research. Then, both the reasoning methods and the scientific methods used along the study, being selected within all the available approaches, will be described. Finally, all the sources of data and information used for the development of this research will be presented.

5.2.1 The research paradigm

"*A research paradigm is a philosophical framework that guides how scientific research should be conducted*" (Collis & Hussey, 2009). Philosophy has been defined as the way the human being uses reason supported by arguments in order to seek knowledge of the reality (*Oxford Compact Dictionary and Thesaurus*). Instead, a paradigm is defined as a scientific model that is recognized and accepted, which provides an approach to problem solving and scientific research.

The two main paradigms accepted by scientific literature are *positivism* and *interpretivism*. Positivism was developed by theorists like Comte (1798-1857) and Mill (1806-1873) and has its foundations in the philosophy called realism. Positivism is a systematic method that has been used for centuries by scientists in natural sciences and recently it has been assessed as applicable also to social science research (Collis & Hussey, 2009). Positivists believe that "*reality is independent of us and the goal is the discovery of theories, based on empirical research (observation and experiment)*" (Collis & Hussey, 2009). Positivist business researchers assess that reality can be explained and phenomena can be predicted by applying theories to business research. According to this scientific approach, they believe in precision and objectivity of results instead of subjectivity and intuition (Collis & Hussey, 2009).

The second paradigm is interpretivism, usually associated to the hermeneutic theory. Interpretivism has been developed as a criticism of positivism, which

recently has been perceived as inadequate and limitative for a complete understanding of the reality (Collis & Hussey, 2009). Hermeneutics believe that reality cannot be explained objectively because it is affected by perceptions of human beings, thus it is subjective. Interpretivism is based on the idea that "*it is impossible to separate people from the social contexts in which they exist*" (Collis & Hussey, 2009). For this reason, investigation cannot be limited to objective statistical analysis because social interactions and subjective perceptions may affect the research. According to Van Maanen (1983), while positivists typically use quantitative methods to describe a phenomenon or a set of phenomena, interpretivists look for methods that can be applied in order to "*describe, translate and otherwise come to terms with the meaning*" (Van Maanen, 1983).

According to Collins and Hussey (2009), there is an important consideration to be done on research paradigms. Positivism and interpretivism are not the only paradigms that have been used in business and scientific research. Instead, they can be considered as the two opposites of a continuum, where different paradigms may coexist just by moving from one side to the other of the continuum (Collis & Hussey, 2009). This assessment is important to introduce a third paradigm called pragmatism. While positivism and interpretivism are limited by specific assumptions that are mutually exclusive, pragmatists affirm that the two opposite paradigms, and the related methods, may be used at the same time, regardless where they come from, and only depending on the usefulness of one or the other to answer specific research questions (Collis & Hussey, 2009).

The nature of this study is mainly interpretivist and hermeneutic. A comprehensive literature review has been carried out by the author in order to find theories that can be applied for the understanding of a phenomenon, and a theoretical framework has been developed and adapted to answer the specific research questions. Moreover, the theoretical framework is just the reference, the guide of the study. The results come from subjective interviews of actors that, being involved in the studied environment with different roles and weights,

are highly affected by their perceptions, and may affect the outcome of the study according to their interests and needs.

5.2.2 The design of the Case Study

The research method used in this research is a Case Study approach. According to Yin (2003) a case study is a logic step to link the research questions with the empirical analysis. According to the author, the literature review has to be shaped based on the research problem and related questions and, by doing so, it allows the operationalization of the case study (Yin, 2003).

Case studies classification

Yin (2003) proposes four different types of case study, which can be seen as part of a two-dimension matrix. A first distinction can be made between single-case study and multiple-case study according to the number of contexts of analysis that are involved in the analysis (Yin, 2003).

Single case studies may further divided into *holistic* or *embedded*, depending on the number of units of analysis within the case (Yin, 2003). Single case studies fit with some specific conditions, like for example the revelatory nature of the analysis of a phenomenon that is to be investigated for the first time, the representative analysis of a typical phenomenon, or when the same case study is to be analyzed two or more times along the time (Yin, 2003). As said, a single case study might be embedded: it means the investigator is able to identify more than one unit of analysis within the same case study. It can be, for instance, an organization studied in different independent areas, or a program that involves more than one project (Yin, 2003).

Multiple-case study is the scenario where different cases are included and analyzed in the same study or research. Again, multiple-case studies may be further divided into holistic, when to each context it corresponds only one unit of analysis, and embedded, when each of the different contexts contain more than one unit of analysis (Yin, 2003).

The following figure represents the matrix proposed by Yin (2003).
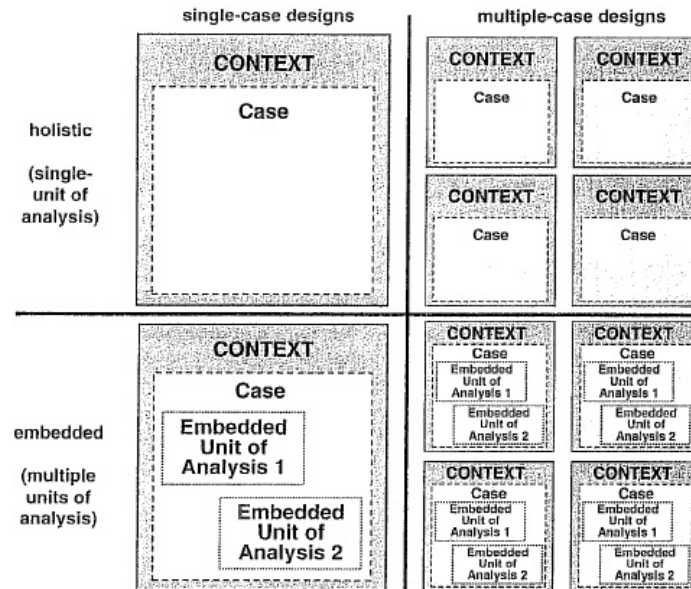
Figure 5-2: Basic Types of Case Studies (Yin, 2003)

In this study, the embedded single case study was chosen as research approach. This is because the context of the study is one, and specifically it is the organization where the research has been carried out, namely an international telecommunication network and service provider. The case study can be considered embedded: the different units of analysis correspond to the different departments of the company where the empirical analysis has been performed and from where the empirical data have been gathered to answer the proposed research questions.

Defining the quality of the case study

Yin (2003) talks about four tests to assure the validity of the case study. *Construct validity* is given by the identification of the specific changes that the investigator is willing to study, and the demonstration that the measures of these changes are consistent with the identified changes (Yin, 2003). The construct validity of this study comes from the fact that data analysis has been made by collecting information from multiple sources of evidence, as it will be presented in the following sections.

Internal validity consists in finding cause-consequence relations and pattern matching during data analysis, in order to allow the investigator to determine whether an event *x* led to the event *y* (Yin, 2003). Internal validity is typical of

exploratory research, and in this study it has been achieved through the development of a specific theoretical framework that allowed the author to identify cause-consequence relations inside the different units of analysis.

External validity of the case study is given, according to Yin (2003), when the findings of the research might be generalized beyond the specific case study. The way to guarantee external validity of a single case study is to apply theories that are coherent with the identified research questions.

The last test is the *reliability*. Reliability consists in proving as much as possible that if another investigator carried out the same study in the same environment, and using the same theories, she should get to the same findings (Yin, 2003). Reliability has been given to this specific study by documenting the procedures followed to carry out the research, as well as by documenting the results of the data collection before getting to the analysis and to findings.

5.2.3 Reasoning and scientific methods

According to Collins and Hussey (2009) there are two main different reasoning methods that, as it will be understood in this section, mostly depend on the research paradigm that is used in the study.

Deductive research is used by positivism as main reasoning method. It basically consists in setting "*a conceptual and theoretical structure*" and testing it with empirical evidence (Collis & Hussey, 2009). According to the authors, the deductive reasoning is intended as a method that moves "*from the general to the particular*" (Collis & Hussey, 2009).

The authors define the second reasoning method as *inductive research*, and it is mainly used by interpretivists in their researches. It has its basis on the creation of a theory by observing a specific empirical reality and trying to get to general conclusions (Collis & Hussey, 2009). This method consists in "*moving from the specific to the general*" (Collis & Hussey, 2009).

The approach adopted in this research by the author consists in using both deductive and inductive reasoning. A framework has been created using existing theories studied in the literature, and it has been adapted to the specific

empirical environment. Then, the framework drives the author in carrying out the analysis of a phenomenon in a specific environment. Lastly, the author tries to generalize the results obtained in his research.

The analysis of data is entirely qualitative. Consistently to the research questions, data collection and analysis aim to understand a phenomenon that has been occurring in telecommunication industry, its implications on the NSD process of a real company and the impact that this change has on its areas and resources. In general the objective of this research is to understand and not to quantify, so a qualitative approach seems to be more appropriate than a quantitative one.

5.2.4 Sources of information

In order to conduct this study, different sources of information have been used. According to Collins and Hussey (2009), data might be classified in two categories: primary and secondary. Primary data are new data generated by a research or a study, and in this specific case they are represented by the interviews and the results of the study. Secondary data are existing data that are collected from existing sources, and in this case are represented by the literature research and the internal documents provided by the company to support the study.

Literature review

A comprehensive literature review has been carried out on the three main topics related to this research, meaning Outsourcing, New Service Development and Business Model, the last two with a specific focus on telecommunication industry.

Company's documents

In order to get a better acknowledgment on the topics and to set the stage for the empirical study, the author also used documents that were available in the company. The objective was from one side to have a realistic understanding of the telecommunication industry and market; from the other to study the NSD process of the company, the involved areas and actors, the specific service that has been used for the study and the related business model.

Interviews

In order to propose a solution to the problem and draw conclusions to answer to the research questions of the study, the author has interviewed 15 people, belonging to six different areas of the company, which represent the six units of analysis of the case study. All the areas are involved in or affected by NSD process, and all the interviewed people are somehow related to the specific service. The interview covered two topics, and thus was divided into two main parts: the first part aimed to understand the reasons of the phenomenon of outsourcing that has been taking place in telecommunication industry, while the second part aimed to assess the impact that this phenomenon has on the current business model as well as on the service development process of the service.

As mentioned, the study involved six different areas, not only the ones that are in charge of the development of the service, but also those that are somehow involved in its life cycle. The objective was to carry out a cross sectional research to be informed by several points of view.

The interviews were semi-structured, meaning that a basic standard template had been developed for all the interviews, but then adapted according to the specific needs of the author in terms of needed information from the different areas.

The template for the interview and the organizational positions of the respondents are available in the annexes at the end of this paper.

6   Setting the stage for the empirical analysis

This chapter will be an introduction to the empirical case that will be presented in the next chapter of the study. In order to better understand the environment where the study has been carried out, two main topics are presented. In the first section, the specific telecommunication service used for the analysis will be described, along with its general characteristics and most relevant features. The second part of the chapter will instead describe the typical NSD process that is implemented in the company where the study has been carried out.

6.1   MPLS VPN Service

MPLS VPN is a telecommunication service that interconnects globally distributed local networks that are supported by Tele Spain Group MPLS infrastructure. The combination of local networks infrastructures and MPLS global networks infrastructure allows connectivity between corporate offices and integration of applications worldwide. In other words, this integrated infrastructure allows organizations and Multi-National Corporations (MNC) to create Virtual Private Networks (VPN) that connect all the offices distributed around the world and that need connectivity (company's documents).

The service combines any types of access/technologies to offer services everywhere thanks to the interconnection with providers around the world.

The figure below is a simplified representation of the service topology:
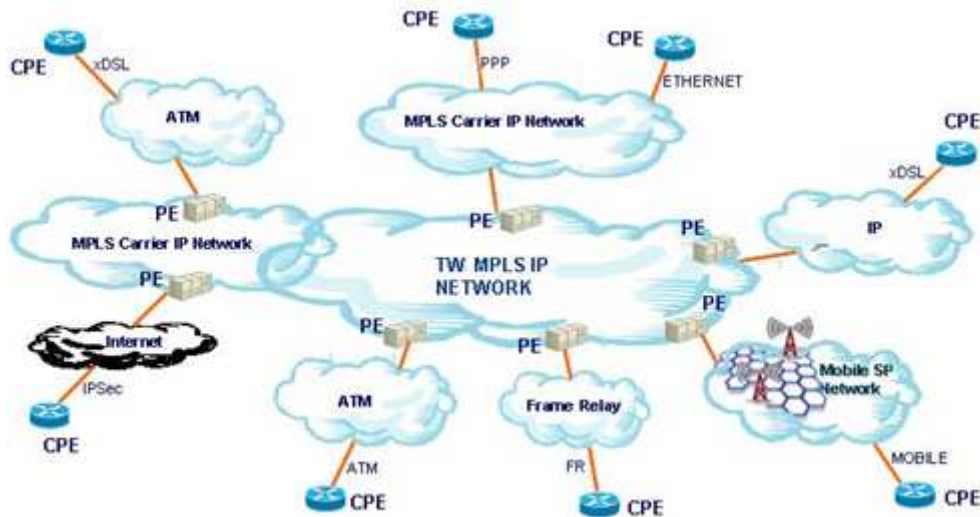
Figure 6-1: MPLS VPN Service Topology. Source: Company's documents

6.1.1 Service Elements

The service is composed by three main elements:

- **VPN**: The term VPN refers to each Virtual Private Network that allows connectivity to all the offices of the organization. The concept of VPN is directly associated to the MPLS VPN service and includes among the others activities like management of the service and VPN configuration options (company's documents).

- **VPN Site**: The term VPN Site refers to each one of the offices that requests a connection to the VPN. Each VPN Site has to be installed and configured. Sub elements of the VPN Site that need to be defined are the access to the network (i.e. Ethernet, xDSL, mobile etc.), Customer Premises Equipment (CPE), and the IP bandwidth which defines the amount of traffic that can be transmitted through the network (company's documents).

- **Gateway**: This is the element that is required when two MPLS networks are interconnected. For this reason it needs a special configuration to assure a common definition that allows proper transit of traffic between the two networks. This is a point of interconnection with a local network

provider with the global international MPLS infrastructure (company's documents).

6.1.2 Service Characteristics and features

The characteristics of the service vary and depend on the specific applications that the customer uses, but there are some features that are generic for the service and aim to satisfy common customer needs and requirements.

MPLS Protocol

MPLS is the anagram for Multi Protocol Label Switching, an IP based protocol which allows all-to-all connectivity and convergence of voice, video and data applications (company's documents).

Connectivity

One of the basic characteristic of the service is *connectivity* between two sites (offices) that are geographically separate and somehow need to communicate and exchange information in the form of IP traffic (voice, video, data) (Morrow & Vijayananda, 2003).

Traffic capacity (Bandwidth)

As long as the connectivity between sites has been established, the capacity of the connectivity has to be defined according to the requirements of customers. Link capacity is usually defined as *bandwidth* and depends on the volume of IP traffic that the site requires (Morrow & Vijayananda, 2003). Due to rapid changes in the business environment, the customer needs may change rapidly in terms of traffic capacity, and the MPLS infrastructure guarantees high level of scalability to increment the traffic in the network (company's documents).

According to the required bandwidth, different access technologies that provide different bandwidth speeds have to be used. The following table summarizes the Access Technologies that TW provides for the Service.

Access Type	Business Interest to Customer
Leased Line	Broad World Coverage, with high reliability and security, but higher costs
Ethernet	Recommended for high capacity and quality needs for headquarters locations. Good coverage depending on countries
xDSL	Reasonable price-quality ratio for small and medium offices with low customer quality requirements
Mobile	Optimum for backup services or quick start up of the office. QoS varies according to the moment and availability of the mobile network
IP Sec	Limited coverage locations reachable through Internet with the lowest QoS
Legacy (Frame Relay and ATM)	Broad World Coverage and better prices than LL accesses. Starting to desappear in many countries

Table 6-1: Available Access Technologies for the Service. Source: Company's documents

Network and Data Security

MPLS VPN also provides network security to the customers. The VPN network and the information that runs through it is accessible only to authorized people that can access only through authorized sites. MPLS protocol guarantees the right level of security, not only at network level but also at data level. Data security refers to the protection of the content of the packets that are transported over IP based networks. MPLS is a protocol that allows the transport of only private content (Internet on the contrary allows both private and public content). As service providers use their networks to provide connectivity to different customers it is fundamental to guarantee network and data protection to customer who wants to build their own private networks on providers' networks (Morrow & Vijayananda, 2003).

Network Availability

One of the most important features that the service must provide to the customer is network availability, meaning that the network service is not interrupted and connectivity is always provided to all the sites of the network. Connectivity might be interrupted due to failures of the components of the service (including the equipments of the clients) or network failure (Morrow &

Vijayananda, 2003). To increase site availability, access redundancy may be contracted as part of the service. It consists in installing more than one access per site, with consequential improvement in the performance (company's documents).

Quality of Service (QoS)

The service, for a correct functioning of the applications, must guarantee a level of quality. The quality level, which is generally called Quality of Service (QoS), has a double function. Firstly, it guarantees a minimum throughput that is required by some applications to run properly. Secondly, and probably more important, IP network is best effort. This means that the network itself does only guarantee that the traffic outgoing from a site reaches the destination. This contrasts with most IP based applications that nowadays are time-sensitive (Voice over IP, Video Conference, Video applications, etc.). This means that these applications require the exchange of traffic within a certain window of time. QoS thus guarantees not only the traffic capacity but also the delay between packets of data as well as the jitter, which is the fluctuation of the delay (Morrow & Vijayananda, 2003).

Service Level Agreements (SLA)[4]

SLAs are contracted between the service provider and the customer in order to have a reference of the QoS provided to the customer. The service commits two classes of SLAs, which are respectively called Generics SLAs and Specific SLAs (company's documents). The generics describe the way the service provider is providing the service (Delivery Term, Site Availability and Maximum Resolution Time). The specifics guarantee the performance (Round Trip Delay, Packet Loss and Jitter) of the network needed for each Class of Service (CoS).

Class of Service (CoS)

As already mentioned, one of the main advantages of MPLS infrastructure is to provide convergence of different typologies of data to be exchanged through the same network using the contracted bandwidth. For this reason, the traffic is divided into 3 main Classes of Service: Voice, Video and Data, which are required by the respective applications. Data Class is further divided into 4

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[4] For a more detailed and theoretical definition of Service Level Agreements in Telecommunication Services, see section 5.3.2 and table 5.4

classes: Platinum, Gold, Silver, and Bronze. In total, there are 6 CoS that differ each other in terms of size of packets, priority in the network, and related QoS. This differentiation makes the service much more flexible and facilitates management and adaptation for the customer (company's documents).

The table below summarizes and describes each of the CoS of the MPLS VPN Service of TW:

CoS	Priority	Description of the CoS
Voice	Real Time	Multimedia Traffic: Voice over IP
Video	Video	Video Traffic: Video Conference, Video on Demand, broadcast Video
Data	Data-Platinum	High priority and critical Data Traffic: Oracle, SAP, ERP, Data Warehousing, Citrix. Two CoS are dedicated to this traffic to avoid competition for the bandwidth
	Data-Gold	
	Data-Silver	Low-Priority Data Traffic: Intranet
	Data-Bronze	Best-Effort Data Traffic: Internet

Table 6-2: Class of Service supported by the Service. Source: Company's documents

Web Interface and Reporting Tools

The service includes the access to a Web interface that allows the customer making commercial operations like requesting the set up of new service components, or modifying the configuration of the existing ones. Moreover, the customer may access through this Web interface to SLA reports to control the behavior of the network in real time (company's documents).

Service Management

Service Management is the set of activities that ensure that all of the elements provided by the MPLS VPN service are operational (accesses, bandwidth, CPEs). The monitoring of the Network is done in Network Operations Centers (NOC) and through Network Management Systems (NMS) tools. NOCs and NMSs play a fundamental role in running and maintaining the networks that support the service. In fact they aim to detect in a timely manner outages and failures of the network as well as taking preventive actions and avoiding

potential network failures (what is generally called *Proactive Management*) (company's documents).

6.2   Service Development Process in TW

The conceptual structure of the Service Development is divided into three main phases: Annual Plan Development, which includes the definition of the Services to be developed along the year; the Service Development Process, which includes feasibility analysis, development, and implementation and launch; and a last phase of monitoring and retire, which includes improvement processes and retirement. Information provided in this section has been gathered from internal documents of the company.
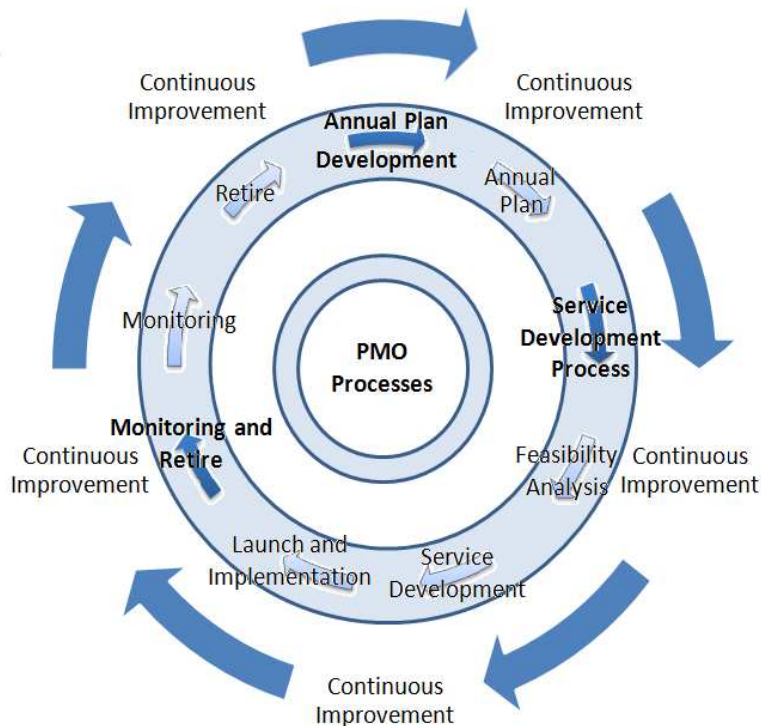
Figure 6-2: Service Life Cycle in TW. Source: adapted from company's documents

Annual Plan Development

This phase of the process consists on the definition of the annual plan of services development. It includes not only the ideas of new services to be launched in the market, but also the ideas of new functionalities and

improvements that are identified in the phase of monitoring and retire of existing services, according to a traversal process of continuous improvement.

Service Development Process

The development life cycle goes through three main phases which will be further analyzed in the next section. Feasibility analysis, service development, and launch and implementation are all part of specific Service Development Projects that are lead by the Project Management Organization (PMO) of the company.

Monitoring and Retire

After the launch and implementation of the services, processes of continuous improvement are carried out. This phase consists in data collection, evaluation of performance and definition of actions of improvements. Instead, when the service reaches the end of its life cycle, it will be implemented a process to stop the commercialization and to retire it from the market.

6.2.1   Service Development Process Roles and relationships

The figure below shows the relationships between all the actors and areas that are somehow involved or affected by the Service Development Process.
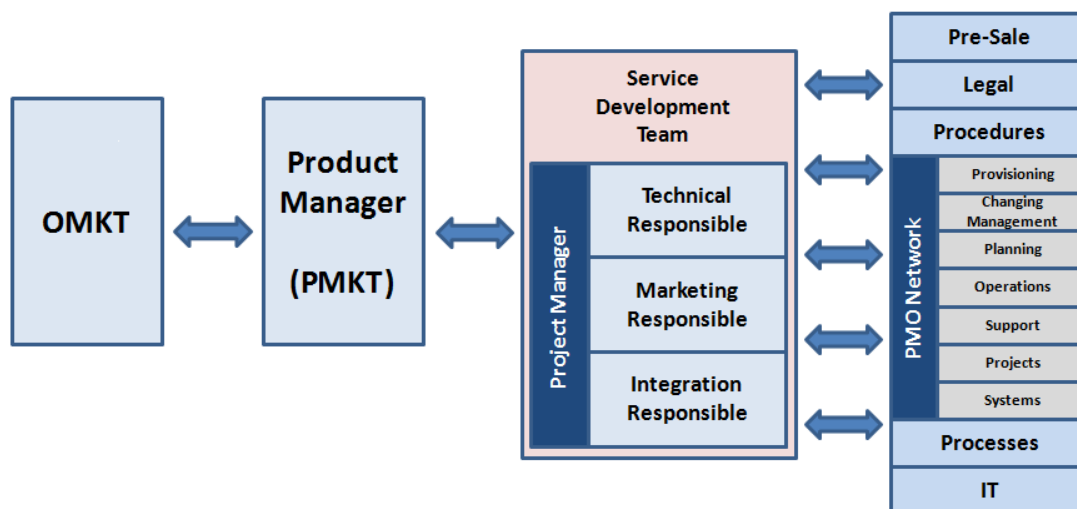
Figure 6-3: Service Development Actors and Relationships in TW. Source: adapted from company's documents.

Operative Marketing Department (OMKT)

It is the internal customer of the process. The role of this area is to define the commercial requirements of the service to be developed, as the forecasted demand, the commercial activities that are needed for the sale of the service, the pricing policies of all the available functionalities. This area interacts directly with the product manager (who belongs to Product Marketing department) for the definition of the service.

Product Manager - Product Marketing Department (PMKT)

This department is in charge of the management of the product portfolio of the company. Each service has a product manager who is the responsible of the definition of the service features and service life cycle management. The product manager actively participates in the service development process being part of the service development team (*marketing responsible*) as point of contact between OMKT and the other actors.

Project Manager

The project manager belongs to the PMO of management and service integration and he is the responsible of the development process of new services, functionalities, activities or improvements. In quality of *integration responsible* of the team, he is the coordinator of all the areas and actors that are involved in the service development process.

PMO of Management and Service Integration

This department, through the different project managers, is in charge of the planning and coordination of all the development projects of services.

Technical Responsible

The technical responsible is part of the technical department, and as part of the service development team, he is in charge of the engineering of the service. In other words, he develops the technical features which respond to the requirements provided by PMKT. He is also responsible of the development of all the technical documentation of the service.

PMO Network

This organization is traversal to the service development process and it is in charge of the development and management of the telecommunication network. The coordination between the PMO and the service development team is fundamental for the integration of the telecommunication service and the telecommunication network.

Pre-Sale

This department is in charge of making the service request for the customer through the IT support system and according to the standard processes of the service commercialization.

Legal Department

It is in charge of the definition and revision of the contractual documentation between the company and the customer. It aims to assure that all the service terms and contractual conditions are correct.

Processes Department

This department is in charge of the definition and standardization of all the operative and commercial processes that are required for the successful development, commercialization, implementation and management of the service.

IT Department

It is in charge of the development of the IT systems that support all the development, commercialization, implementation and management of the service.

6.2.2 Service Development Process Description

For each of the projects that have been included in the annual plan, a service development team is created and the service development process starts being carried out. As already mentioned, it is composed by three main phases, feasibility analysis, service development, and implementation and launch. The three phases will be briefly summarized in the following section.

Feasibility Analysis

The first stage of this phase is the *service creation*, which consists in the identification of all the requirements that are to be developed. Its output is the concept document, which describes the service and it is drafted by the Product Manager.

The second stage is the real *feasibility analysis*, carried out by the technical responsible and the integration responsible. In this stage, it will be assessed whether the realization of the service is feasible from a technical point of view and if the IT systems, the infrastructure, and the current processes are able to support it. If the feasibility analysis is approved, the project manager will generate the scope document, which describes the commercial features of the service to be developed.

The third stage is the *project planning*, which receives in input the concept document and the scope document, and consists in the planning of the activities that are required for the development of the service. Moreover, the technical and commercial documentation of the feasibility analysis will be presented to the involved areas of the organization. Finally, it will be approved the responsibility matrix of the project.

The last stage of the feasibility analysis is the *draft of the preliminary business case* by OMKT, where the financial impact of the development and implementation of the service is evaluated. To go on with the project, the business case must be approved by the investment committee.

Service Development

As long as the preliminary business case has been approved by the investment committee, it starts the stage of *agreements with third parties*, subcontractors, providers and carriers. This stage aims to procure all the elements (i.e. equipments, network coverage, etc.) that are needed to develop all the functional, technical, operative and commercial requirements of the service as well as for its launch. An agreement plan will be developed in this stage.

The following stage of the process is the *generation of the documentation*. The product manager writes the marketing manual, with all the commercial features

of the service; the technical responsible writes the technical manual with all the technical characteristics of all the commercial features. These manuals are then presented to the areas involved in the service development. PMKT is also responsible of the generation of all the commercial documentation for the customer.

Receiving in input all the manuals, the different areas will be able to better define the costs of development, and with this information OMKT will *draft the final Business Case*. This business case has to be approved by the investment committee, and this means that the service is allowed to be launched.

The following stage consists in the *definition and standardization of Models and processes*. PMKT will develop the commercial catalogue, and technical department will develop the technical catalogue. Processes and Integration areas will collaborate for the definition and standardization of the commercial and operational processes. The will be also responsible of the planning of the pilot test with the customer. OMKT, with the support of PMKT, will develop the marketing and launch plan for the service. Finally, IT Department will design the IT support systems to all the processes.

Implementation and Launch

The first stage of this phase of the service development process consists in the *implementation of a Pilot test*. The test will involve all the interested areas and all the processes, models and IT systems. As long as all the tests of the pilot have been carried out and validated, the service is considered ready to be implemented and launched.

Before the commercial launch*, training sessions* to areas have to be carried out inside the company. This stage consists in: a technical training, held by the technical responsible of the service development process; a commercial training held by MKTP, processes training and IT training that are held by the related areas both with the support of the responsible of the PMO of management and integration.

The last phase of the process is the *commercial launch*. Before the official commercialization, the service is officially submitted to OMKP that has to make

the final approval. The service is then configured or re-configured by the PMO Network, and finally the marketing and commercial plan is executed by OMKP.

The figure below shows a comparison between the NSD of IP-based services proposed by Morrow and Vijayananda (2003), the Service Development process of the company and the NSD process used in RPF by Froehle and Roth (2007). It has been modelized for the purpose of this study.
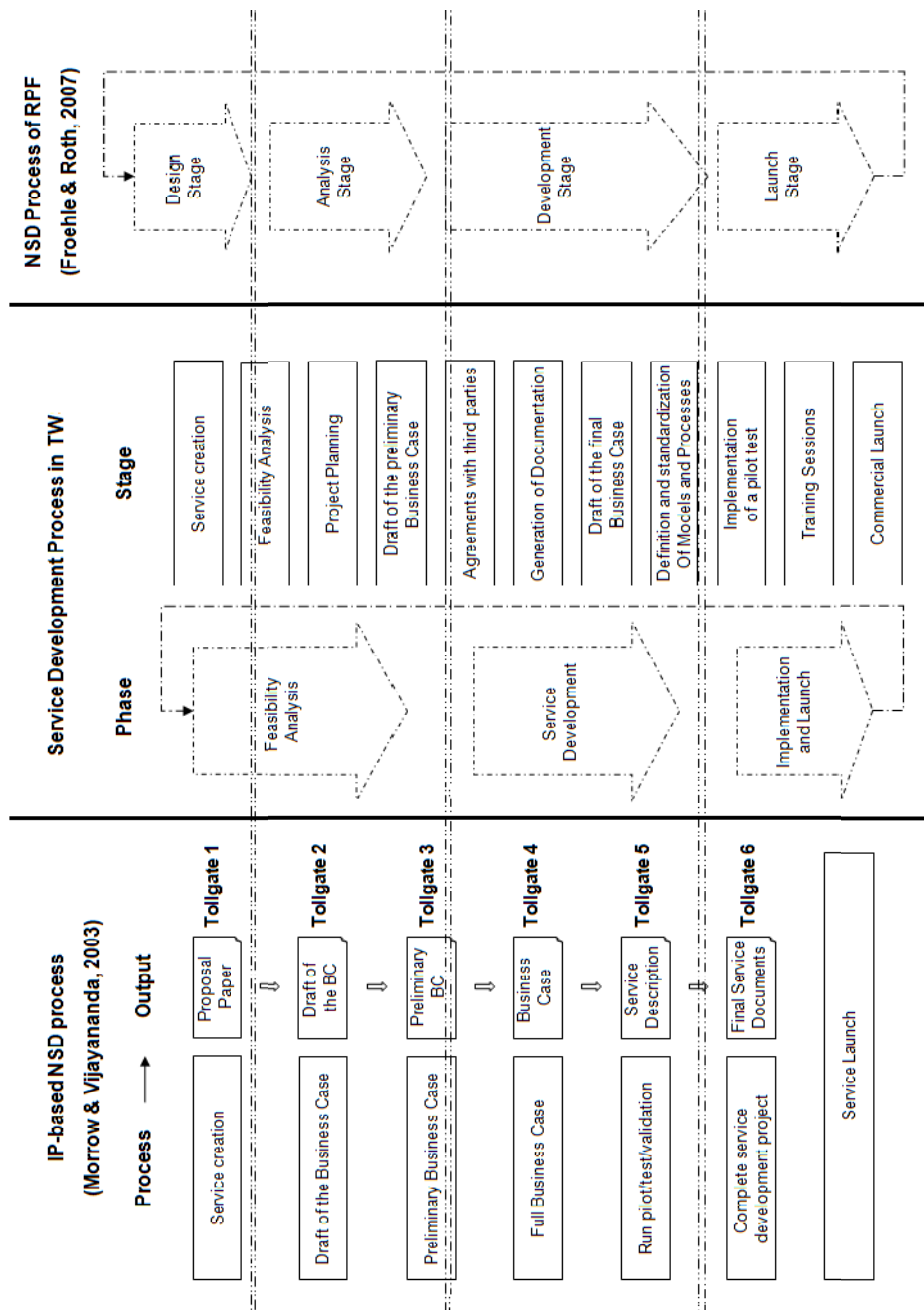
Figure 6-4: Modelization of the IP based Service Development process, RPF and TW'S service development process

7 Findings

This chapter will present the results of the empirical analysis carried out in the company. In the first section, the current business model of the telecommunication service is presented, with the aim to identify the main activities that have to be performed and that will be the subjects of the research. In the second section, the results of the first part of the interview related to outsourcing will be summarized. In the third section, it will be presented the new business model which already includes the changes due to the externalization process made by local operators, to which it corresponds an internalization process made by international operator. The fourth and last section of the chapter will instead present the results of the second part of the interview. These results are related to the impact that the internalization of the activities identified in the "to be" scenario would have on the development of the new service and on the resources of the company.

7.1 The current business model of MPLS VPN in TW

As mentioned in chapter 2, where the research problem has been defined, MPLS VPN is a service that consists in specific features, functionalities, and activities, that are developed and performed partly by TW partly by the local carriers or operators which sell directly to the end customer.

The following figure is a representation of the whole service business model, as it is provided to the end customer. It includes six main activities: Marketing, Sales and Commercial Relationships, Service Engineering, Performance Monitoring and Reporting, Customer Technical Support, Service Management, and Customer Care. These activities are performed along three main phases: Pre-Sales, Delivery, and Operations. Each macro activity is composed by one or more micro activities. The description of each activity will be presented in the following section. The colors of the activities allow distinguishing those that are performed by TW and those that are performed by OBs or Carriers.
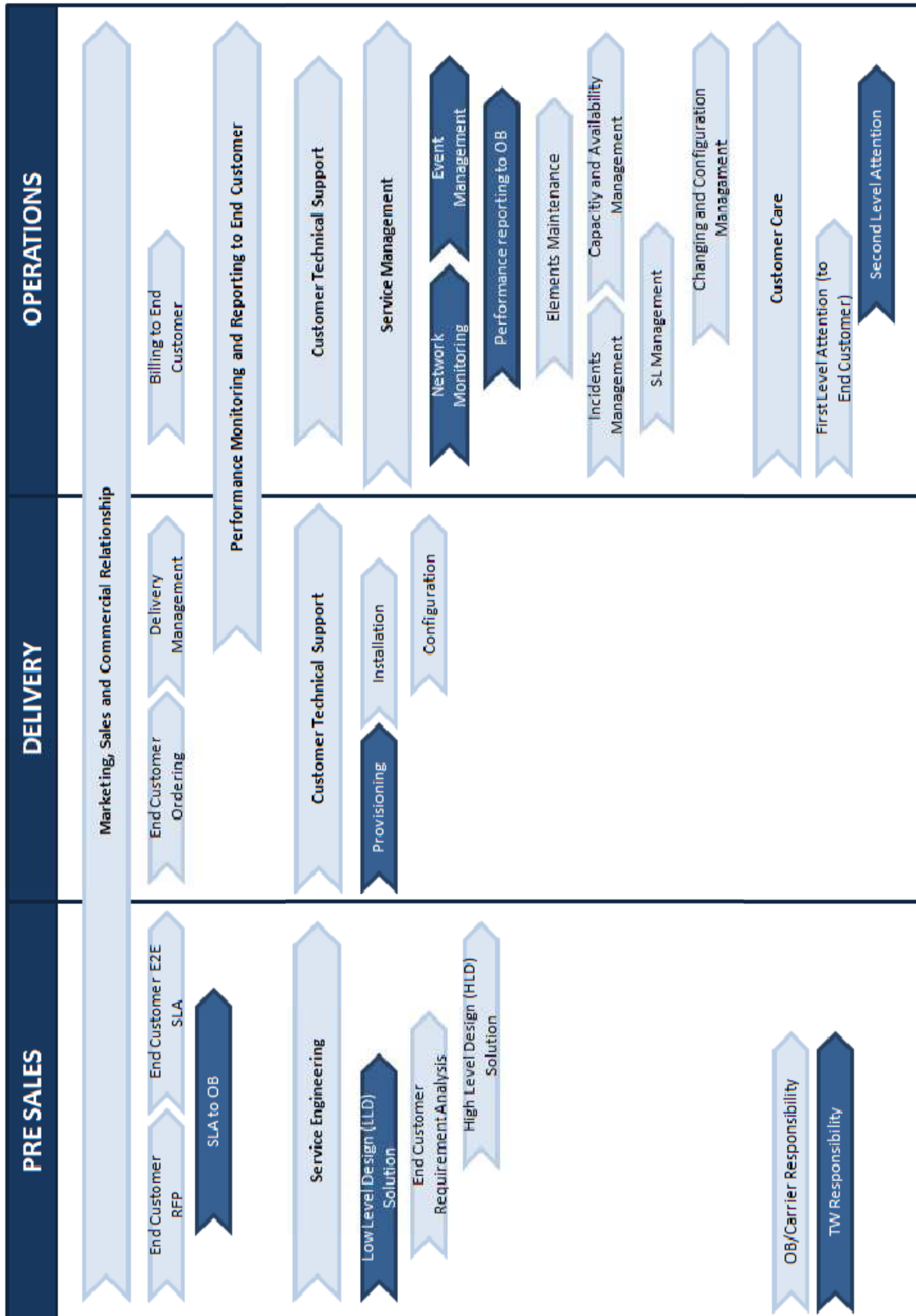
Figure 7-1: MPLS VPN Service as it is perceived by the end customer (adapted from company's documents)

7.2 Data collection related to Outsourcing

This section will summarize the interviews made by the author in the different departments of the company. The six macro-activities previously identified will be described and analyzed from an outsourcing perspective, using the dimension defined in the theoretical framework presented in chapter 5.

7.2.1 Marketing, Sales and Commercial Relationships

It is the macro activity related to commercial issues: it consists in marketing and advertising the service and its functionalities, creating the contact with the end customer, selling the service, and maintaining the commercial relationship with him. It is the only activity that lasts all along the phases of the business model. During the phase of pre-sales, it involves the Request for Proposal (RFP) of the end customer as well as the definition of the commercial SLAs that will assure to the customer the required Quality of Service. In the phase of delivery it consists in ordering the elements of the service with the agreed characteristics and functionalities, and in delivery management. Finally, in phase of operations, it consists in billing management to the end customer. In fact, most of the billing concepts of the service are composed by a fixed initial price, usually called Non Recurrent Cost (NRC) as well as periodical payments based on flat tariffs, technically called Monthly Recurrent Costs (MRC). All the activities that involve a direct commercial contact with the end customer have been performed by the local operators.

Core Competencies of Local Providers

According to the line managers of product and operative marketing, the local OBs are the ones that know the local or regional markets of their networks, as well as their customers and their specific needs in terms of communication.

As it emerged from the interviews with the line managers of product marketing and networks, nowadays telecommunication industry has been changing quickly, some players of the information industry like Google and Skype have found the way to reduce the power of telecom providers, and these two industries are getting closer and closer. These new players are threatening telecom operators' leadership. Nevertheless, telecommunication companies can count on their competence of selling connectivity, which is something that these

new players are not yet able to do. Moreover, connectivity requirements may differ depending on the customers, the markets, and the regions. In order to exploit this competence and maintain it sustainable along time, local providers have to maintain close relationships with the end customers, to understand communication requirements and adapt the connectivity solutions to these requirements.

TM and all the other OBs want to focus on marketing and commercial relationships with their customers to be able to retain them. To do that, they need to maintain the commercial relationship with them, especially when they are important, big and international.

"No local operator in the world would easily renounce to its customers, especially when they are multinational corporations"

[Line manager of networks in TW].

There is an important example that shows how important it is for the local OBs to maintain a close relation with their customers. Tele Spain Group few years ago start up a new business unit called Telecom Multinational (TM) with the aim to increase the presence of the group in the market segment of multinational organizations. The peculiarity of this business unit is that, besides its global strategy, its international vision, and its international customers, it has local sales forces to increase its presence in local markets and to be more effective in gaining and retaining customers.

To support what previously said by the line manager of networks, it is interesting to notice that Tele Spain Group serves more than 400 multinational corporations, but TM's market is represented by less than 200 hundred of them. This means that the other 200 are "property" of the older OBs that do not want to lose them, even if it means "giving" them to another operator of the group.

Core Competencies and Capabilities of International Provider

Two factors emerged from the interviews, especially from people of operative marketing and sales, and people from product marketing. Firstly, TW is a wholesale service provider, so by nature it sells standard services to local operators without reaching the end customers. TW is a company which is part

of a large group and it represents, along the value chain, the entity that interconnects all the others. From a commercial viewpoint, what drives competitive advantage to TW is the ability to make partnerships and alliances with carriers. This allows TW to increase its presence and coverage all over the world, being much more attractive for OBs and Carriers. The competitive advantage lies in the creation of an integrated and extended network, which is generally difficult and costly to be achieved and maintained. TW's position within the group is strategically important to maintain this advantage along time. Secondly TW, in the current status, would not be able to assume the control of marketing and sales activities to the end customer. This does not mean that sales department would not have the know-how to perform these activities to the end customer, but the company would require more presence to the end market. This requires an increment of capacity of the sales forces and also the capillarity that retail market has and wholesale market does not, as reported by sales managers of TW.

Assets Specificity

Among the categories of assets contemplated in the study, which are human capital, network, and IT systems, almost all the respondents agreed on the necessary involvement of human capital and IT systems for sales and commercial activities.

"*Human capital is the direct point of contact with the customer, the interface that guarantees the good experience of the service, more than the high Quality of Service*"

reported the manager of technical department talking about the importance of human capital in sales and commercial activities as well as in Service Engineering. Human capital must develop a high level of know-how of the end customer, must be local, must know what its customer wants, and must be able to speak the same language of its customer. This tacit knowledge held by local sales forces is difficult to be developed and it is even more difficult to re-deploy it. Tacit knowledge is not easily transferrable and the high specialization that local sales forces have achieved along the time makes the human capital dedicated to commercial activities a specific asset.

IT systems support the commercial activities and make them more automated. Here the challenge is to develop a set of IT applications that allow getting closer to the end customer for the customization. Among the others, IT systems must be Multilanguage, must support applications that tracks the status of the ordering activities as well as delivery ones, and must have financial applications able to perform billing activities to the end customer (manager of IT Systems). Exactly as the human capital, IT systems used to support commercial activities have the peculiarity of being highly *end customer oriented* and highly focused and specialized to specific markets. It would be very difficult to develop IT systems with general characteristics consistent to the specificity of each local market. For these reasons, IT systems dedicated to commercial activities cannot be re-deployed.

Economies of scale and Cost reduction

Collection of data related to this topic highlighted three main characteristics that have been identified as representative of marketing, sales and commercial activities. First, the two marketing departments all agreed that the mentioned activities are *highly human capital intensive*; second, as highlighted by the respondent of IT systems department, it is very *complex* (and even unproductive) to try to achieve *standardization and automation* of these activities; third, respondents of the department of product marketing and alliances assessed that they require a high *capillarity* in the market and local presence. Specifically, the last intrinsic characteristic of these activities appears to be the main barrier to achievement of economies of scale and economies of scope, due to the impossibility of concentrating volume of business.

Organizations' strategies

"*Commercial activities are related to effectiveness, not to efficiency*"

reported a project manager of the PMO of Management and Integration. Commercial activities involve the direct contact with the customer, and they involve the ability to sell the service not for the sake of sales, but instead because *this* service is better than *that* service, and *this* service provider is better than *that* service provider. Commercial activities aim to effectively reach and retain customer, providing a good experience. It is to increase presence,

capillarity, and effectiveness of these activities, that many local operators are further sub-dividing their markets into smaller regions or areas.

Instead, the "good and cheap" service is provided by back front activities. Service Management will be in charge of efficiently manage customer's VPNs, provisioning will be in charge of making the service ready-for-use in an efficient and rapid way, as well as operators of NOC will ensure at least the agreed QoS.

IT systems and automation in general, may help to speed up and standardize processes, but are not generally related to cost reduction strategies.

7.2.2 Service Engineering

Service Engineering is the macro activity related to the design of the technical solution of the VPN of the customer. It is performed mainly in the phase of pre-sales, when the interaction between customer, sales forces and technical department aims to design the solution that best fits customer needs. Service Engineering in TW may be divided in three main parts: Low Level Design (LLD) Solution, end customer requirement analysis, and High Level Design (HLD) Solution. The first activity consists in designing standard technical functionalities according to market trends and generic customer requirements. Access Technologies, Class of Services, Routing Protocols, MultiVPN features are few examples. The second activity consists in the analysis of the technical requirements of each site of the VPN of the end customer. It aims to assess which applications will run on the VPN, the related requirements in terms of CoS and total bandwidth, and network and data security requirements. The last phase consists in the customization of the solution according to the requirements defined in the requirements analysis. In the current business model, LLD Solution is performed by TW, while requirement analysis and HLD Solution, which require a direct contact with the end customer, are performed by local operators and carriers.

Core Competencies of Local Providers

Respondents of the operative marketing highlighted how service engineering requires know-how and experience, and it is the "tangibilization" of the service. Depending on how well the customized solution is designed and shaped to the needs of the end customer, this will perceive if solution works properly or not, so

it is basically an activity that drives customer satisfaction. The customization of service solutions allows widening the service portfolio in terms of functionalities to be provided to the customer, making the service more attractive for the end customer. Innovation and completeness of the solution in terms of features enhance customer satisfaction by increasing the QoS. Moreover, the more innovative and complete the service is, the more it is difficult for competitors to be copied. Completeness and innovation of the customized solution can be seen as source of competitive advantage that lasts along the time, especially when the comparison is made with standard wholesales services that, being provided with standard engineering, may not get to the same level of completeness and width of portfolio of features.

What emerged from the interviews is the criticality of this activity along the value chain. Both TW and the local OBs are telecommunication service providers, and for this reason service engineering is a core competence of both TW and the OBs.

"*Right now the issue is: who is able to provide the better integrated solution to the end customer*?"

[Line manager of the technical department].

Instead, the line manager of TW explained the history of MPLS VPN Service. TW started developing unmanaged VPN Service as an international extension of the national service of the OBs. As long as the customers were local and not spread in the world, it was easier and more profitable for the local OBs to develop their own managed service, while TW had the role of integrating this service with its international service, in order to cover places in the world where the local OB could not get. The whole service results then to be a combination of many "modules", each one conceptually similar to the others, but each one with different characteristics and features according to the specific requirements of the local markets and local customers. Some of these differences can be integrated or made compatible, but this increases complexity in development and in operative costs. In order to offer a global service that meets customer needs, it is necessary to provide a global solution that might be easily customized. Many of the respondents from marketing and technical

departments highlighted how TW may achieve better results thanks to its strategic position that ensures high visibility on all the international networks and third parties offerings.

Core Competencies and Capabilities of International Provider

TW was created as an independent company whose objective was to develop telecommunication solutions that allow integration between the solutions developed by the local OBs of the group. Thus, besides the strategic role within the company that positions TW as an international integrator of services more than a service provider itself, TW still is a telecommunication operator first of all, whose core competence is to design telecom solutions. As mentioned by respondents of marketing and technical department, the portfolio of TW in terms of service solution is relatively narrow and highly standardized, because of its position that requires to keep its solutions as much standardized as possible, to allow integration with other providers' solutions.

Besides that, it arose from the interviews another factor that leverages TW's competencies in design solutions: its close relationship with technology providers. TW, unlike local operators, may take advantage of its global and wider vision, making the collaboration with technology providers more effective and enhancing technology innovation. Local operators do have strong relationships with technology providers, but this collaboration is not as much effective as the one that TW may achieve, due to the narrower visibility that OBs have of the global environment.

Assets Specificity

People interviewed from all the departments agreed on fundamental role of human capital and network (while less importance has been given to IT systems) in service engineering.

Telecommunication engineers are required for the design and development of solutions, and these activities are human capital intensive and unlikely to be automated. The required know-how is very specialized but available and transferrable. For this reason, this asset did not appear as high specific.

Instead, network appeared as a limitation more than a support. Respondents from network department affirmed that the current network is ready to support the technical solutions of the VPN Service in terms of capacity and capillarity. Limitations may come from technological differences between networks of different providers. For example, xDSL accesses provided by operators in Spain are different from the ones provided by operators in Italy. This may lead to limitations in development of technical solutions that cannot be integrated. These premises lead to the considerations on the specificity of the network: the whole network "owned" or controlled by TW is the results of the integration of many different local networks, each one with its specific characteristics and limitations. The creation of this logic network took long time and it allowed TW to acquire a specific knowledge and experience that is not easily transferrable, nor easily achievable by local OBs, that can count only on their small networks.

Finally, IT systems have been mostly identified as support systems with irrelevant impact on service engineering itself.

Economies of scale and Cost reduction

According to the head manager of technical department, one of the best benefits that TW could achieve by widening its portfolio of solutions would be standardization. Design and development of a new solution require relevant dedicated investments and intensive use of resources. Nevertheless, once it has been developed, it is available in the portfolio of solutions and the incremental cost and effort required deploying it for larger volumes business is minimal. Instead, it is important to understand which minimum level of demand justifies the investment and the use of resources for the development of the solution.

Thus, widening the portfolio of the company would allow TW to reduce development costs and Time to Market (TTM), thanks to reduced impact of customization. Also according to the line manager of the technical department, economies of scale are likely to be achieved. It is important in this case to understand where the point of efficiency is, and try to reach it.

Organizations' strategies

TW, to take advantage from its position, must widen its portfolio of service solutions. In this way, local operators would be able to provide to the end customer a unique global service that can be customized according to the specific needs of the customer:

"*More than quality of Service, it would be able to provide quality of experience*"

[Head manager of Technical Department].

Marketing department also agreed on this topic, core competencies of the whole group would be leveraged thanks to the combination of a global vision provided by TW and a local relationship maintained by the local OB.

7.2.3 Customer Technical Support

Customer Technical Support is an activity that is performed during delivery and operation phases. During delivery, it consists in provisioning the end customer with the equipments required for the VPN, installing all the elements of the service and configuring elements and equipments in order to make them ready for the service. Provisioning is currently performed by TW, while installation and configuration are performed by local operators because they are the entities in charge of managing the service and its elements. Customer technical support in phase of operations consists in all the activities of incidents resolution that might be identified during the management. They are performed by the entity that manages the service and its elements.

Core Competencies of Local Providers

According to the perspective of operative marketing, customer technical support is identified as one of the point of contact with the end customer. Besides that, it is a technical and operative activity that has to be performed by the organization that develops and manages the service, which is not necessarily the organization that sells the solution to the end customer. This dependence of the activity to the "creator" of the solution is fundamental to guarantee the consistency of installation and configuration with the processes and parameters defined for the monitoring and the management of the VPN of the customer.

Also the respondents of network department, of the PMO of management integration, and of the technical department agreed on the fact that the activity itself does not drive to differentiation. The competitive advantage is driven by the consistency between the technical support and the offering in terms of functionalities. An efficient technical support is not effective if it is not perfectly aligned to the systems and to the infrastructures in charge of the service management. On the other side, a complete and well designed solution, shaped and customized according to the specific needs of the end customer, would not be effective if it is not supported by consistent technical support. The alignment of the two faces of the coin is necessary to provide a good QoS and to enhance customer satisfaction.

Core Competencies and Capabilities of International Provider

The answers related to this topic are linked to the answers given to the previous one. Technical department has identified this activity as *complex* and *time consuming* but not really difficult in terms of capabilities that must be developed, provided that TW is a telecommunication operator and for this reason it is supposed to be able to perform it efficiently and effectively.

Besides that, the engineer of the technical department identified an interesting point of discussion. While provisioning is an activity that does not itself provide any value, installation and configuration are activities that can be standardized (they could be also automated, but this point will be considered later). Standardization of this activity is achievable when the equipments and the elements to be configured are standard and allow the same operations for the configuration. The best hypothetical scenario (only from configuration point of view) would be having only one technology provider that provides all the equipments. Standardization leads to increase of efficiency and effectiveness of operations and improve the activity itself and indirectly the experience of the customer. This standardization appears as achievable in TW that might concentrate the volume of customer support activities.

Concluding, customer technical support is not a core activity by itself, but it must be perfectly aligned with service engineering and service management to ensure the quality of the service.

Assets Specificity

Almost all the interviewees agreed that the only asset really necessary for developing and performing customer technical support is human capital. IT systems have been identified as support tools for the activity and its related tasks.

Human capital in this case refers to the technical engineers that after provisioning have to configure the equipments. The activity is *complex* and *time consuming*, because it requires the configuration of the Wide Area Network (WAN) of each site and the Local Area Network (LAN) of the equipments, in a way that allows management of the VPN as well as of the traffic.

Nevertheless, what emerged for service engineering seems to be valid also for customer technical support: the required know-how is very specialized but available and transferrable. This leads to conclude that the asset itself is not high specific can be considered re-deployable.

Economies of scale and Cost reduction

As already said, customer technical support has been identified as human capital intensive and time consuming activity. Provisioning, installation and configuration required deployment of fixed resources for invariable periods of time and with fixed expenses, which are independent by the volume of the business. For this reason, it is difficult to achieve economies of scale.

Nevertheless, respondents of the technical department highlighted a related issue. It is true that it is unlikely to achieve economies of scale in customer technical support, but on the other side, by internalizing this activity, TW is likely to achieve economies of scope and specialization. This leads to increased efficiency, increased effectiveness, and in cost reduction while performing this activity.

Organizations' strategies

Regarding this dimension, the line manager of the technical department during the interview mentioned an interesting anecdote: technology providers have been launching in the market *automatic configurators*. Automatic configurators would not make this activity totally automated, but significantly reduce the

manual activities that are currently required. It is an option that is under evaluation, considering that the initial investment would be relevant but, depending on the volume of the business, may drive to economies of scale and significant cost reduction.

This lead to an important consideration: regardless it will be introduced or not, operators consider customer technical support as an activity that does not drive to differentiation. Instead, methods to achieve cost reduction are under evaluation.

7.2.4 Performance monitoring and reporting to end customer

This activity starts during the phase of delivery, when the service has been installed and the equipments configured. It lasts all along the phase of operations and it is the activity that monitors the performance of the network, allows and supports service management activities. Moreover, it creates an interface with the customer who is provided with reports of performances of the service and its elements: relevant information and reports about the end-to-end VPN performance are obtained by processing the data collected by the monitoring and other mechanisms, thus allowing the customer to have an indirect control and monitoring over the service (company's documents).

Core Competencies of Local Providers

Performance measurement and reporting are value added activities: most of the times the customer only requires that the service works properly, with exception of some specific customers that might have critical applications which need specific performance level (high traffic, high quality traffic, multimedia applications, security). Usually there are few end customers that are interested in a continuous monitoring of KPIs or required detailed monitoring reports. This activity has been identified by all the respondents as a "plus" for the end customer. Nevertheless, it is considered important for two main reasons.

Firstly, as said by a project manager of PMO of management and integration:

"*Performance monitoring and reporting is an important activity because it involves methods of accurately measure international KPIs between customer sites*",

meaning having a kind of control/knowledge of all the networks, enhancing service management.

Secondly, as highlighted by the interviewees of product and operative marketing, performance monitoring and reporting are the interface between the operator and the end customer during the phase of operations. Reports of performance and of service management quality are the tangible part of the service.

As it happened with service engineering, it emerged from the interviews the issue of accurately assessing who can perform these activities better. The local operator has tools of reporting that are more oriented to end customer, but also very "local" (i.e. local language, different unit of measures, etc…); moreover, performance measure and monitoring are limited to the local networks, and gathering information on performance of international and third parties networks (i.e. SLAs) is getting harder and harder, being a more and more relevant need of those end customers that are becoming international and multinational.

Core Competencies and Capabilities of International Provider

As previously said, this activity involves the utilization of IT tools that measure KPIs of the networks. Telecommunication networks are becoming more and more integrated, and the same customer may have a VPN with sites spread all over the world and connected to different networks of third party providers. According to the respondents of network department, TW is the only provider of the group that, thanks to its international position and to its role of network integrator, has the widest visibility and access to these networks. This allows a more efficient monitoring of the networks and of all the elements of the VPN in each site.

Assets Specificity

All the three assets, human capital, infrastructure, and IT systems have been identified as necessary for the development and performance of measurement and reporting activities. This activity resulted to be the most automated one, with human capital that contributes but with the role of definition of functionalities, development of applications, and support.

The core of the activity is performed on the infrastructure (and on the service elements) by the applications of the IT systems. The infrastructure itself does not require any modification, configuration or specific action on it:

"*It is just the street where the traffic flows, and IT systems are the ones in charge of monitoring this traffic*"

[Line manager of network department].

Thus, infrastructure is not considered as a specific asset for this activity. The activity can be performed regardless who the owner of the infrastructure is.

Instead, IT systems and related application play a fundamental role: it is the system that controls the packets for the measurements of KPIs, it is the system which "talks" with the CPEs, it is the system which sends alarms and probes, it is the system which calculates KPIs and creates reports. As suggested by interviewees of the IT department, IT systems are not affected in terms of capacity of processing data: nevertheless, it is necessary to develop ad hoc applications that allow efficient and effective measurement and process this data to create reliable reports. This set of assets requires long time to be developed, specialized know-how, established experience and high knowledge of the market in terms of available solutions and market trends.

It is a very specific asset that is not easily transferrable and re-deployable, being highly specialized.

A last concept about reports: it emerged from the interviews in product marketing and IT department that TW lacks of tools and applications for reporting. The structure exists, as well as the know-how to develop applications over the structure: a set of standardized, user friendly, and end customer oriented tools has to be developed.

Economies of scale and Cost reduction

As already reported, this activity is highly automated. According to the respondents of the IT systems as well as of the product marketing departments, the objective is to create a standardized set of tools for reporting that might be customized according to the specific needs of the end customer. To achieve it,

it is important to develop modular applications. If a specific application is developed for each customer, everything turns to be costly and inefficient. The fact that TW may concentrate the volume of customers and develop standardized and modular applications, regardless the end customer, its location, and the location of the sites of its VPN is a driver for economies of scale and relevant cost reduction.

Organizations' strategies

Performance monitoring and reporting is a value added activity for the service and for the end customer. TW is looking for synergies that allow standardization and consistency of measurements as well as reporting. As explained by the line manager of product marketing department, the last goal of the company is to provide the customer with a set of tools that are the same in any site, regardless the country, the specific location or the used language.

7.2.5 Service Management

Service Management is the set of activities that consists in the effective monitoring and efficient resolution of incidents of the infrastructure, service elements, equipments, and VPNs of the customer to guarantee the quality of service agreed with the customer. This activity lasts all along the phase of operations, from the time the service is ready for use to the time it is uninstalled and retired, and consists in many sub-activities that will be briefly described. The description of these activities has been extracted from the documents available in the company.

Network Monitoring consists in the supervision of the behavior and performance of the international network and, in case of managing the VPN of the customer, also the VPN and its elements, including the CPEs. Network Monitoring gives benefits to the service mainly in three ways: firstly, it allows reducing the time to notice outages and to activate the incident management process; secondly, by executing tests periodically, it is possible to identify the root causes of the incidents before they actually occur; finally, it allows taking the control of the VPN of the end customer, which itself allows maintenance and management of SLAs (company's documents).

Event Management consists in the continuous monitoring of events and alarms that might come from the network, and in case of managed service, from the VPN of the customer. This allows TW to take action in order to prevent or solve incidents, before the customer perceives a degraded service. In order to provide effective event management, it is fundamental to define accurate thresholds of service degradation in a way that the generation of alarms does not overload the whole service and network (company's documents).

Network monitoring and event management are currently performed by TW at the level of its international network, not at the level of customer VPN and related CPEs that are supervised by the OB which sells and manages the service.

Performance Reporting to OB is the equivalent of performance monitoring and reporting to the end customer previously mentioned, but in this case addressed to the local operator. The scope is different, because the objective of reporting to OB is to keep the local operator informed on the status of the network and the VPNs that run over it. Instead, the objective of performance reporting to the end customer is to provide accurate, well formed and easily accessible end to end reports that allow the monitoring of each specific VPN contracted by the end customer (company's documents).

Element maintenance is a set of activities performed on the elements of the VPN. Specifically, *preventive maintenance* consists in maintenance actions with the aim of prevention of outages and failures. *Corrective maintenance* consists in reactively undertaking actions, when incidents or outages occur, in order to restore the service rapidly. Finally, *evolutionary maintenance* aims to forecast service evolution according to customer needs as well as technology trends, and accordingly take decisions and execute actions (company's documents).

In unmanaged MPLS VPN, service element maintenance is performed only on the elements of the I-End and B-End of the service, while the OB has the total control over its elements of the A-end.

Incidents Management is the set of activities required to quickly repair the service and restore operations, and to minimize recurrence of incidents with

similar root causes. The last aim of incidents management is to reduce the impact of outages and problems on the customer's business operations (company's documents).

The scope of *Capacity and Availability Management* is to optimize customer VPN's capability, in order to define and achieve a sustainable level of service availability, according to customer needs and in a cost effective way (company's documents).

With *Service Level Management* TW aims to maintain and improve the quality of the MPLS VPN Service defined with the customer. This activity basically consists in the continuous recognition of current and future service requirements. Moreover, it aims to guarantee that the operational areas of the company and the related processes accurately support the service ensuring its appropriate quality conditions (company's documents).

Changing and Configuration Management is a double face activity. On one side, its scope is to make sure that standardized methods and procedures are used for efficient treatment of changes required in the service by the customer; on the other side, it aims to ensure that the VPN of the end customer and the related service equipments are correctly configured, identified by the systems of the company, and constantly monitored (company's documents).

Core Competencies of Local Providers

Service management is the guaranty of the good functioning of the service, but it is a "transparent activity" for the end customer. In other words, as long as the service works properly, the customer does not perceive which entity manages its service.

Moreover, as it emerged from the interview with the head manager of the technical department, service management is strictly related to service engineering of the service. Specifically, if the solution is designed according to the needs of the end customer, and the VPN is correctly dimensioned according to the required capacity, service management would be a simple activity of proactive monitoring, continuous improvement of the performance, and evolution according to the changing needs of the customer.

Furthermore, as mentioned by the line manager of the network department, service management requires high visibility and control over all the networks, over the whole VPN of the customer, and over each site and CPE, regardless where they are and how spread they are around the world. When the organizations were mostly local, the OBs were able to achieve the required level of visibility and control; on the contrary, nowadays the organizations are becoming more and more international, and local OBs have been progressively losing their capacity of controlling and managing the whole service. In fact, the core competence of the local operator related to service management, it has always been the monitoring of the local network, facilitated by the extensive know-how that it holds on its network. Instead, a global international service requires wide visibility over all the networks, visibility that local OBs and Carriers cannot achieve.

Core Competencies and Capabilities of International Provider

Service Management, as previously mentioned, is an activity that requires high visibility over the international networks, and over all the VPNs and their elements. TW potentially has this capability of total visibility over the networks, which is supported and enhanced by international experience in telecommunication service development. This is not enough: according to the interviewees of the network department, service management is effective only if TW has the control over all the elements, guaranteeing what is called "end-to-end management". The competitive advantage comes from this strict control over the whole VPN and over any of its sites, which enhances service management, thus increases QoS.

Another important topic emerged from the interviews with the network and IT systems areas. Service management requires dedicated infrastructure and dedicated IT systems, like NOC and NMS. TW, due to its position, centralizes operations in its infrastructure and has standardized procedures that make service management more efficient and effective.

Assets Specificity

Service Management requires all the three assets identified in the study. Human Capital is represented by the service manager, the key role for the management of the MPLS VPN Service.

Service Managers are responsible for guaranteeing that the service is provided with the agreed quality, acting as the interface between the operative areas of TW and the customer (company's documents). Their job is to guarantee technical management of the service and to manage all the aspects related to the performance of the service, deviations and corrective actions. Besides their technical role, service managers are also involved in more commercial activities, like the definition of the operational SLAs, which are needed to build the commercial SLA to be committed with the customer (company's documents).

Service managers have to develop a profound knowledge of both the customer and the organization that provides the service, and the operational and relational procedures that govern the relationship between the two entities. This know-how is unique for each specific customer, and cannot be easily re-deployed for any general customer.

Regarding infrastructure, the network is not the only one involved in service management: this activity requires dedicated centers called Network Operations Centers (NOC), the physical place where all the services are constantly monitored and managed. TW owns two big NOCs, one in Madrid, Spain, and the other in Lima, Peru.

Finally, IT systems are required, and specifically dedicated applications called Network Management Systems (NMS). These applications are costly and must be maintained always upgraded to provide a good service management.

Economies of scale and Cost reduction

According to the respondents of the technical department, managing a telecommunication service require high investment, like dedicated service managers, customer care centers, maintenance centers and equipments, and besides the investment in people, also the physical centers NOC as well as

management software NMS are very expensive and only high volume of business may justify the investment.

NOC and NMS require relevant investment. They are capital intensive, requiring both CAPEX and OPEX. Centralization of these activities in big platforms allows saving costs in management and operations.

Local OBs and Carriers, especially when they are small, do not have the capacity to manage services of multinational companies, especially services like MPLS VPN which might have sites spread all over the world. It is cheaper to manage few and big international network platform than small and localized ones.

"*It is not a case that Telecom US (TUS) has already decided to externalize both NOC and NMS*"

[Line manager of technical department].

Organizations' strategies

As it emerged from the interviews made in the operative and product marketing departments, the local OBs of the group are trying to reduce operative costs related to service management by externalizing these activities to TW, which is the entity of the group that may consolidate volumes of operations and achieve economies of scale.

7.2.6 Customer Care

This activity involves all the tasks that aim to receive and solve queries of the customer. It is part of the phase of operation in the business model, and it is currently composed of two sub-activities. First level attention is the direct contact that the customer has with the company, the typical call center where queries are collected and processed to be solved. Second level attention consists in directing and processing calls or e-mails related to service incidents to the NOC in order to allow operators to fix incidents and close tickets.

Core Competencies of Local Providers

Respondents from operative marketing put emphasis on this activity, defining it as a point of contact between end customers and OBs. High performance of

this activity makes the end customer feel the good quality and the good experience of the service, enhancing customer retention.

The more operative side of this activity involves efficiency in incidents resolution; thus coordination between all the actors of the value chain is important to reduce resolution time and maintain optimal level of service availability.

Nevertheless, customer care, intended as the call center that receives queries from the end customer and addresses these queries to the respective responsible, is not considered a core competence of a telecommunication service provider.

"*Tele Spain Group is one of the largest telecom service providers of the world, and it sells connectivity and communication*"

stated the line manager of network department.

Call center and the customer care in general is an added value activity that allows the customer to feel the good experience provided by the service.

Core Competencies and Capabilities of International Provider

TW is not much *end customer oriented*. The wholesale model does not require this proximity to the end customer. Nevertheless TW, because of its strategic position, would be able to centralize this activity in its centers of customer care, providing a unique interface to the end customer.

There is another aspect that emerged during the interviews with the manager and the employees of marketing departments. TW has the possibility to get closer to the end customer, speeding up the flow of information from the end customer to the company and improving performance of the activity. Afterwards, performance improvements in this activity would directly impact performance improvements in service quality.

Assets Specificity

Almost all the respondents agreed that human capital and IT systems are required for the development and performance of this activity, while infrastructure intended as the network is not involved.

First level of customer attention does not require specific background or know-how of the labor force. Moreover, as suggested by an employee of product marketing department, this activity might be highly automated with the implementation of ERP systems making it less *human capital intensive* and more *IT intensive*.

Second level of customer attention requires a higher involvement of operators and engineers of the NOC, and integration with applications of the NMS.

In general, neither the infrastructure, nor the IT systems and the human capital required to perform these activities present high specificity, being available in the market and not requiring any level of high specialization of resources, which would make them unlikely to be re-deployed.

Economies of scale and Cost reduction

As previously mentioned, customer care requires investments in IT systems like ERP, that are usually expensive. The investment is justified only if it is possible to achieve relevant volumes of operations. Thus, if TW is able to centralize post sales operations and to implement standard processes of customer care based on ERP and CRM, Tele Spain Group as a whole may achieve significant economies of scale and related cost reduction.

Organizations' strategies

OBs of Tele Spain Group have been externalizing post sales and customer care activities to third parties. Nevertheless, they are maintaining the control on these third parties organizations. If each business unit of the group had its own customer care center, cost optimization would be difficult to be achieved. Instead, especially for service like MPLS VPN and all the other services addressed to corporations, centralization and aggregation of volumes would lead to cost optimization.

7.3 The Business Model of Managed MPLS VPN

The previous analysis has been functional to the definition of the new business model for the managed MPLS VPN service to be developed by the company. The figure below shows the activities that, due to outsourcing reasons, are moving from being performed by the local operators of the group to TW. It is important to notice how, from an end customer perspective, the service does not change. What does change is the distribution of activities to be performed by different actors along the value chain.
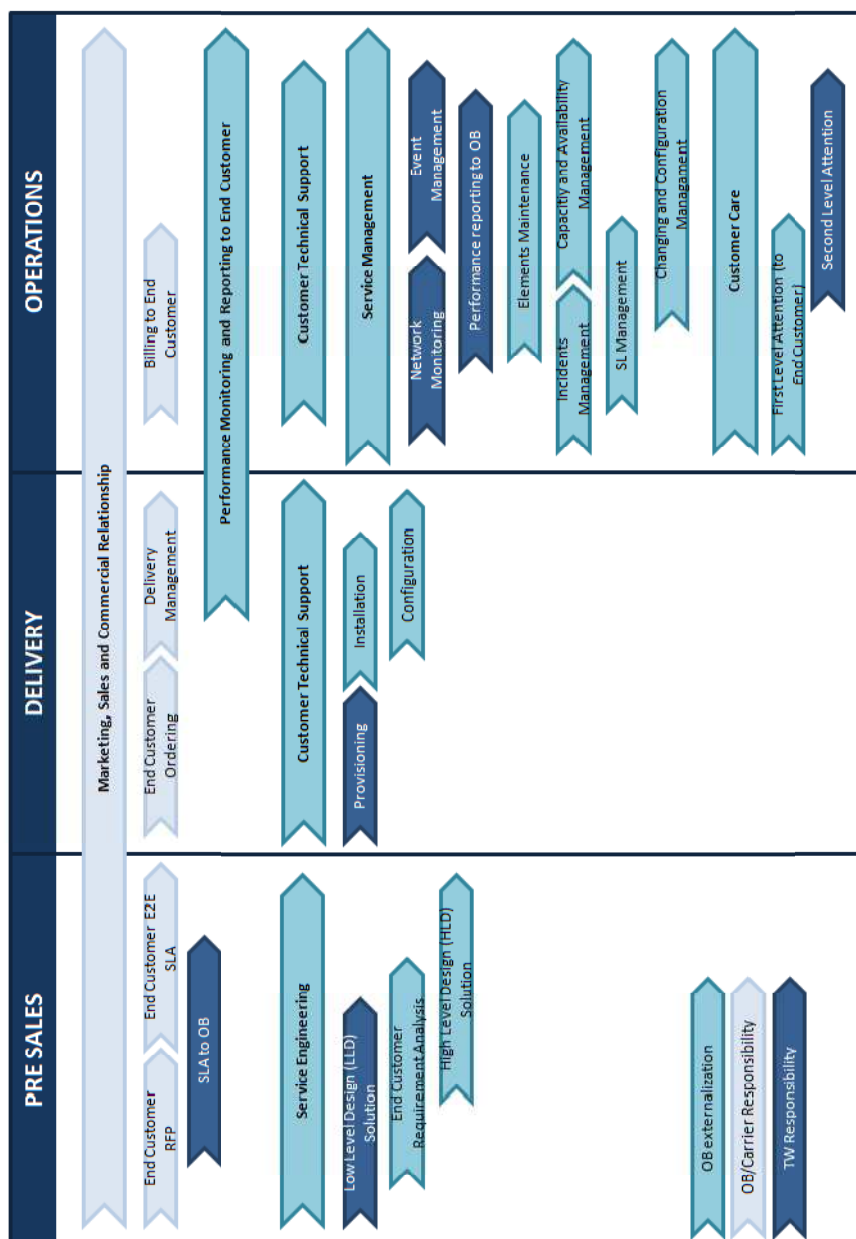

Figure 7-2: Managed MPLS VPN Service business model with activities externalization

7.4 Data Collection related to the development of the new service

In the following section it will be presented the results of the second part of the interview, carried out by the author to assess the implications that TW will face while developing the managed MPLS VPN Service. Only the activities that had been previously identified as responsibility of TW have been analyzed. In other words, marketing, sales, and commercial relationships, have been excluded from the analysis because they will not be internalized by the company.

Moreover, not all the activities will be affected by all the stages of the NSD process defined in the theoretical framework. The table below shows how the different activities match with the NSD process' phases and the business model's phases. The matrix gives a comprehensive perspective of the service and helps to focus only on the phases that are actually involved in the development and commercialization of the service.

	Pre Sales	Delivery	Operations
Design Stage	Service Engineering		
		Performance Monitoring and Reporting	
			Service Management
Analysis Stage	Service Engineering		
		Performance Monitoring and Reporting	
			Service Management
			Customer Care
Development Stage	Service Engineering		
		Performance Monitoring and Reporting	
		Customer Technical Support	
			Service Management
Launch Stage		Performance Monitoring and Reporting	
		Customer Technical Support	
			Service Management
			Customer Care

Table 7-1: Matrix that combines the stages of the RPF with phases of the service business model

7.4.1 Service Engineering

Design Stage

Service Engineering implies the definition of functionalities of the service, and the design of a solution suited to the needs of the customer. For this reason it requires a high level of collaboration with the customer. Afterwards, requirement analysis has to be performed on the site, jointly with the end customer. Almost all the respondents agreed that quality of the service mostly depends on the ability of understanding customer needs and translating it in a technical solution.

The interviewees of the technical department suggested another perspective: the importance of the input of technology providers (Cisco, Juniper, etc) because they are the ones that at the end provide the technological elements that may or may not support the technological options (and configurations) required by the customer.

Service Engineering to the end customer, along with Service Management, has been identified as pillar of the managed MPLS VPN by all the respondents. Specifically, according to the majority it makes possible for TW "*to act as the group's international carrier to meet all the international traffic needs and to provide international IP connectivity for the group's local internet service providers through its international backbone*". Moreover, seven of the interviewees identified also the contribution of Service Engineering "*to provide global scope to all fixed and mobile services for MNCs and for new innovative services that can leverage in its global presence*". Afterwards these are three of the pillars of the strategy of the company.

Analysis Stage

People from technical department generally agreed on the importance of *market research* in terms of portfolio of solutions and technological features that compose the offerings of the competitors, for the sake of positioning. Also the respondents from marketing departments agreed on that: it is necessary to know what the market requires and what the competition offers in order to be able to position a service in the market.

"*This is even more important now that TW is entering this new segment of the market*"

[Line manager of Product Marketing department].

On the other side, the two respondents of the PMO of management and integration stated that market research is not very relevant for service engineering in terms of customization of the service (intended as HLD solution).

Interviewees of the technical department suggested also the analysis of technology providers and partners to foster this activity.

Instead, the line manager of network department told an anecdote to highlight the importance of *feasibility analysis*. A competitor, after having won a big project of VPN for an important MNC, structured the business case on the requirements of only few sites located in the same country. This competitor believed that those requirements could have been generalized to 80% of the sites of the whole VPN, while the other 20% would have required customized design. The reality turned to be reversed: only the 20% of the sites respected the requirements, while the other 80% required customized solutions. This competitor got in troubles because of the unfeasibility of the solution.

Development Stage

Service engineering has been identified as *human resources intensive*. From a *financial perspective*, most of the respondents focused more on operational expenditure than on dedicated investments as TW already has a well established structure and tools that does not need further investments. Moreover, it emerged the fact that TW's direct customer still remains the OB, which at the end is asking only to add the management umbrella to the current service. In this case, the technological complexity of the configuration is not as high as to require high investments.

When consulted on *technological aspects*, respondents agreed that the most relevant changes would affect the equipments of the service. TW will provide and configure end customer's CPEs, which will be contracted by TW directly to technology providers, allowing it to have total control over the CPEs and their configuration. The infrastructure will not be affected much by this shift:

"*With the current infrastructure that TW has, it is possible to accomplish customer needs*"

[Line manager of network department].

Instead, it emerged how the infrastructure might become a limitation for service engineering. The unmanaged MPLS VPN Service has a standard engineering that is potentially supported by all the networks of the providers, and then it's up to the local OB to customize the service in a manner that each network supports the customized solution. Now everything would be in TW's hands, which has to know what solution might be supported by each carrier. IT systems would require significant upgrades and more end customer oriented applications, especially *Sigma* and *Infovista*, as emerged from the interviews with IT department respondents.

The engineering of the end customer's solution did not appear as unaffordable for the current *human resources* that would perform the activity. In fact, most of the interviewees didn't see, from engineer perspective, a relevant gap for the development of a service that afterwards remains a telecommunication service, regardless the fact it is managed by TW or by another operator. Nevertheless, two issues arose frequently:

- The need of getting an end customer orientation;

- The increased complexity of the tasks, related to the proximity to the end customer that would require an increment of the dedicated labor force.

From an *organizational perspective*, the following paragraph will summarize what emerged from the interviews. Product marketing, which is the area that defines the commercial solutions of the service, coordinates activities with the technical department. This last one is the most involved area because it studies the feasibility of the commercial solution and tries to adapt it to the needs of the customer. Network department is highly involved because it has to assure that the network effectively and efficiently support the service. There is another area which plays a very important role in this activity, which is pre sale. This area is in charge of transmitting to the technical department the requirements of the customer. In other words, this area plays the role of interface between the

development process and the customer. Finally, PMO of management and integration is responsible of integrating product marketing requirements and technical department solutions in IT systems. Managerial support is necessary for the initial validation of the service and as a sponsor for the development.

7.4.2 Performance Monitoring and Reporting

Design Stage

This activity can be divided in two different conceptual parts: what the customer is willing to monitor, which is provided through performance reports, and how TW measures in the network and in the service elements what the customer wants to monitor. The first one is the interface with the end customer, so that it must be customer oriented and user friendly. Besides that, what the customers wants to monitor is almost standard for telecommunication services (traffic, delay, jitter, packet loss, CPU usage). The second one is more technical and it has been defined by respondents as *back end activity*. The technical department and the IT area define how to measure performances, and the activity is absolutely "transparent" to the end customer.

Respondents from the two marketing departments mentioned the fact that the end customer, most of the time, doesn't have this expertise and actually is not interested in monitoring specific KPIs of its service, as long as the service works. Performance network and reporting have been identified as value added activities and the objective is to be able to provide a unique friendly, Multilanguage and standard interface for the end customer.

This last comment is directly related to the objectives of "*acting as the group's international carrier to meet all the international traffic needs and providing global scope to all fixed and mobile services for MNCs and for new innovative services*" as the line manager of Product Marketing department stated.

Analysis Stage

Respondents from the technical department highlighted how performance measurement itself is a *technology driven activity*. It is neither easy nor differential to know how operators make measurements in their networks and in the equipments they provide. Moreover, limitations as well as improvements

come from technology providers and they depend on how they develop equipments. Instead, interviewees from both technical department and marketing departments highlighted that reporting of KPIs must be aligned to what the market asks and to what the competition offers. From the interviews it emerged the fact that this is even more important for managed MPLS VPN Service with respect to the unmanaged one: it requires much more complex applications and tools. For example, as suggested by the line manager of technical department, in US market there are applications that are much more complete, powerful and detailed than the ones currently offered by TW, due to different needs of the end customers, and this forces TW to plan and develop updates to its solution.

This topic emerged more clearly from the interview with the IT system manager, who mentioned the need of being updated in terms of applications that are used in the market. As he said:

"*This doesn't add value to the service itself, but it adds value to the whole offer to the end customer*".

From the interviews performed in product marketing department and with the PMO of management and integration, it emerged the importance of positioning in the market in terms of SLAs offering, concept which is directly related to performance measurement and which impacts service management.

Development Stage

All the respondents agreed on the fact that this activity, both in terms of performance measurement as well as in terms of performance reports, is highly automated. It is an activity that requires advanced applications and platforms for monitoring

The line manager of IT systems highlighted that a managed service requires an extension of the "visibility" of the systems over the network and the equipments. IT systems have to "dialogue" with more elements, collecting and processing data that come from different sources (the CPEs, the PEs, the MPLS network, etc…). This, according to him, implies the upgrade of the systems in terms of

processing capacity as well as of the current applications that transform these data in useful information not only for TW but also for the end customer.

Not only it is needed an upgrade of the system itself, but also an effort in terms of applications to be programmed is required. Regarding this issue, interviewees from the two marketing departments agreed on the need of a "cultural change" of the applications, which must be more user-friendly and customer oriented. From a *financial perspective,* most of the respondents assessed that investments in technology are more required than investments on human capital, in other words the development affects more CAPEX than OPEX.

This activity*,* according to the majority of the interviewees, does not require any improvements on equipments, because all the equipments are configured to be managed, regardless which entity manages them. The impact on the network could be a bit more relevant because packets of data that are used to monitor the network and the equipments (probes) may overload the network. As the line manager of network said:

"*It has to be found the right tradeoff between service management and related dedicated traffic to avoid saturation of the network.*"

From an *organizational perspective*, it emerged the "double face" (technical and commercial) of the activity: in this paragraph it will be reported how the different areas have to interact for its development and performance. The two marketing departments define what to measure and specifically product marketing gives the market perspective, while operative marketing is the voice of the end customer. The PMO of management and integration transmits this "voice" to IT department that is the one in charge of "transmitting" to the systems how to make measures and also develop reporting applications.

Launch Stage

Performance reporting is the tangible part of the service, the interface that the end customer has with the company. Ten interviewees out of fifteen assessed that it is not necessary to train the OB on this activity. Some others added that this is not necessary because the local operator already knows what this activity

offers; in other words, for the OB this activity is "transparent", in the sense that the local operator is not involved in it.

On the contrary, the end customer has to know how to use this set of tools and applications that are provided during the launch and installation of the service.

"*When the service is provided to the customer* – stated the line manager of the technical department – *TW provides a welcome package which aims, among many other things, to inform the customer on how to use these tools*".

7.4.3 Customer Technical Support

Development Stage

Customer technical support involves installation and configuration of the service before the launch and the start of operations. Although supported by dedicated IT systems, nowadays in TW the configuration of equipments is performed manually by the technical department.

Almost all the interviewees defined this activity as *human capital intensive*, *time consuming*, and *complex*. As highlighted by the line manager of the technical department, with unmanaged services, the role of TW was limited to the delivery of the equipments, while now it should be extended to the installation and configuration.

"*The complexity of this activity* – said the line manager of the technical department – *comes from the LAN configuration in the CPE that allows the management of the VPN and its elements by TW. Instead, WAN will not be affected*". By mentioning these two topics, it emerged the need of human resources.

Instead, the project manager of MPLS VPN Service assessed that tools to automate configuration of equipments exist in the market, but they require huge investments, and complex development. Nevertheless, the implementation of these systems would cut operational expenditures.

From an *organizational perspective*, customer support requires involvement of the technical department, which is in charge of definition and RFS solution.

Network department has to implement the service on the network, and pre-sales is the interface and the point of contact with the final customer.

Launch Stage

Standardization of processes appeared as a key point for this activity, as it is the step of connection between service development and operations. In this phase it is fundamental to ensure consistency between the designed solution and the expected quality of service, and configuration is the step that guarantees this consistency.

A perspective emerged from the interviews with respondents of the operative marketing. Customer technical support is a point of contact with the end customer, because it is when TW enters "*in the house of the end customer*". Besides that, the more this activity is "transparent" to the customer, the more the customer will perceive the quality of the service and feel the good experience.

7.4.4 Service Management

Design Stage

The design of Service Management must be shaped on the VPN. For this reason it depends on how well TW designs the solution for the customer. Besides that, the customer is neither expert nor interested in knowing or influencing the management of the service, as long as it is working properly and efficiently according to its needs.

Respondents from the operative marketing highlighted that in phase of pre sales there are few customers that actually require SLAs more aggressive than the ones provided by default by TW. These customers are most of the times technology experts or have special needs for their applications.

"Service management is the activity that is supposed to assure service quality, but the customer is not directly involved, and as long as he perceives the quality, service management is not a visible activity for the customer"

[Line manager of technical department].

Analysis Stage

Respondents of the technical department highlighted the operative and back-end nature of the activity, which is not influenced by the customer. Instead, the definition of SLAs is more affected by the feedback from operative departments. Network department for instance is in charge of defining the ranges of SLAs of round trip delay, jitter and packet loss, that are feasible for the physical transportation of data packets in the network; provisioning department has to fix the ranges of feasible delivery times; technical department has to fix the ranges for feasible site availability SLA.

Respondents from the two marketing departments agreed that market and competitors' analysis helps TW to understand how to position the service in the market. As the input cannot be provided by the end customer, it is important to know where the company is, in terms of offering compared to the competitors. Moreover, different markets may have different offerings in terms of SLAs and service management, as well as global market of MNCs has its own specific requirements. It emerged from the interviews that, as TW is about to launch a new service in a new market segment, competition is a valuable reference to offer a strong management according to the requirements of the market.

Development Stage

It emerged from the interviews the close connection between service management and performance measurement and reporting. Specifically, performance measurement is the input for service management, while reporting activities are the output of the flow.

Service management requires high investments in terms of infrastructures (NOCs) and IT systems (NMSs) and this is the reason why it is important to concentrate operations. Regarding infrastructure, all the respondents agreed on the fact that TW has already international centers of control, so that the differential impact in terms of capital expenditure would be minimal. Instead, it emerged the fact that IT systems should be improved in terms of data processing capacity and monitoring activities, for example to identify trends occurring in the VPN, to analyze root causes of this trends, and to generate alarms.

Moreover, as explained by the head manager of the technical department, Service Management would require a lot of people monitoring the networks and the elements, and acting consequently.

A viewpoint emerged from respondents of PMO of management and integration. Usually automation of activities requires a high capital expenditure but has the positive effect of decreasing dedicated human resources, allowing reduction of operational expenditures. Service Management does not necessarily respect this rule. The more powerful the systems are, the more information they process, and the more people are required for the management. Service degradation has been mentioned as an example. Service degradation happens when the KPIs, for any reason, show a proximity to the SLAs by over-passing "security thresholds" (company's documents). Performance monitoring is the activity that allows the monitoring of this phenomenon enhancing effective and efficient management. To be able to do it, having powerful systems is not enough; instead, many operators that constantly monitor the performance and collaborate with the other departments involved in the service management are also needed.

Summarizing, Service management appears as the most impacting activity on the resources. A tradeoff is required between the quality of the service management that TW is willing to achieve and offer to the customer and the resources required to achieve these objectives.

"*The risk is to dimension the resources to achieve high quality levels and end up with inefficient use of the resources*"

[Employee of product marketing].

From an *organization perspective*, in this paragraph it will be reported how the different areas have to interact for its development and performance, as emerged from the interviews. Technical department, provisioning and network departments provide feasible technical SLAs that are then translated by product marketing into commercial SLAs. PMO of management and integration and IT systems department are in charge of transmitting what developed to the

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systems in order to synchronize NMS and reporting applications that will be used in operations.

Launch Stage

The launch phase requires training to the different areas involved in the operations. Specifically, two groups were frequently mentioned during the interviews by respondents of product marketing, operative marketing and technical department:

- Service Managers, who have to know what the service offers in term of management functionalities

- Operators of the NOC, who have to know what to monitor and how to solve incidents

As previously mentioned, service management has been defined as a "transparent" activity to the end customer, so it is not required any training.

7.4.5 Customer Care

Analysis Stage

Customer care is an activity that helps TW "*to provide global scope to all fixed and mobile services for MNCs and for new innovative services that can leverage its global presence*", which is one of the strategic objective of the company. Respondents from marketing departments highlighted the commercial side of this activity: customer care is the point of contact of the service during operations. Instead, respondents from technical department highlighted the importance of effective and efficient customer care to improve the operative quality of the service: not the experience itself, but the technical SLAs, like site availability, maximum resolution time of incidents, etc…

Post sales and customer care require advanced ERP solutions that allow automation of the activities, and coordination between operative and commercial areas. Specifically, pre-sales, post sales, customer care, processes and operators of NOC must have standardized procedures to speed up the information flow from the customer to TW, enhancing effectiveness and efficiency of problem resolution.

Nevertheless, it emerged how TW is willing to provide a unique interface and point of contact with the end customer. This would reduce the distance between the end customer and TW, but it would require more people in charge of this set of activities.

Launch Stage

Human capital appeared to be a relevant asset for customer care activities. The launch of manage MPLS VPN Service requires a *cultural change* of the company, and specifically activities like customer care that require a direct contact with the customer will be the more impacted.

Training programs have to be carried out to the involved areas, to make operators aware that the new interlocutor is the end customer and not anymore the OB. The difference is relevant: the OB is a telecommunication operator; the know-how of OBs is much higher than the know-how of an end customer that finally just wants that the service contracted provides connectivity.

Furthermore, it emerged from the interviews the need of *training the end customer* in terms of kind of tickets that might be open, procedures, specific points of contacts, etc…

8   Discussions and general conclusions

This chapter will provide the general conclusions of the research. While drafting the conclusions, the author tried to match the results of the empirical analysis carried out in the company with the topics and the theories described in the chapters of literature review. The first section is dedicated to the general conclusions on outsourcing, while the second one is dedicated to the development of managed telecommunication services and related organizational implications, according to the structure provided by the theoretical framework developed for the research.

8.1   Outsourcing - Theoretical implications

8.1.1   The strategic importance of marketing and commercial activities

Marketing, sales and commercial relationships in general have been identified as the core activities of local OBs of the group, which have to capitalize on physical and commercial proximity to the end customer. RBV may help to assess the importance of these activities from two different perspectives. Firstly, Grant (1991) assessed that firms may lack resources and capabilities and it is part of the corporate strategy to assess which of them have to be developed internally and which can be acquired externally. Accordingly, this study highlighted how local OBs of the group may count on local sales forces with relevant experience and knowledge of local markets, while the international provider lacks of these assets and of these capabilities, mainly due to its international position and its role of wholesaler, which position it far from the end customer along the value chain. Instead, as suggested by Bramson-Boudreau (2010), local OBs can count on well established and recognized brands and on higher proximity to the local end customers, which have been identified as sources of future value and drivers of sustainable competitive advantage, consistently with what stated by Quinn and Hilmer (1994).

Summarizing, and consistently with what stated by Bramson-Boudreau (2010), there are three main factors that have been identified as drivers for competitive advantage and that local OBs of the group have been trying to exploit:

- Well established and recognized brands
- Local sales forces with relevant experience and knowledge of local markets
- Proximity to local end customers

Moreover, as it will be discussed in the following sections, the recognition of these drivers helps to identify those activities that do not provide competitive advantages but instead complement the core ones by adding value to the whole offering. These last activities, as suggested by Grant (1991), are the most likely to be outsourced.

8.1.2 The role of Service Engineering

In this study it emerged the fundamental role that service engineering plays in driving customer satisfaction. A well designed solution that fits *perfectly* customer's requirements in terms of connectivity has been identified as a driver of competitive advantage. Quinn and Hilmer (1994) assess that when an activity or an asset drives competitive advantage, outsourcing is unlikely to happen because the company does not want to lose its advantage by externalizing it. Nevertheless, Argyres (1996) assesses that outsourcing is more likely to happen if suppliers are known to have better capabilities in providing the same activities. This study highlighted how the international provider is in the conditions and in the position to achieve high performance in design service solutions, due to its high visibility on the international markets. It emerged from this study a trend towards mass customization of telecommunication service solutions. The ideal situation would be to create a very wide catalogue of service functionalities in a standardize way, in order to be able to customize the service over the specific needs.

Mass customization leads to increase flexibility in provisioning, higher responsiveness of the international service provider to the MNCs market segment, and reduced Time to Market.

It is interesting to notice that increased flexibility, higher responsiveness and reduced TTM had been identified by McIvor (2005) as the main benefits that can be achieved with outsourcing strategies as well as increasing requirements in telecommunication industry, as suggested by Thomas (2009).

8.1.3 Outsourcing of value added activities

This study highlighted how outsourcing is more likely to happen for these activities that do not directly provide competitive advantage. Instead, as emerged from the study of Gilley and Rasheed (2000), organizations seek for economies of scale and economies of specialization in value added activities, according to the generic strategy of cost leadership suggested by Porter (1985). Network monitoring and reporting, service management, and customer care have been identified as value added activities, though in different ways. Network monitoring and service management are the back-end activities that the end customer does not see, but allow him to feel and perceive the quality of the service. Reporting and customer care have instead been identified as the front-end activities that allow coordination between the user and the provider of the service during operations. The next sections will go through the two main benefits that outsourcing drives: better performance in operations, and cost reduction and economies of scale.

Increasing performance in network monitoring

By centralizing volume of operations, the international provider may achieve better levels of know-how and experience than local OBs of the group, which lead to specialization, as suggested by McIvor (2005) and by Bramson-Boudreau (2010). Moreover, this player can count on the support of dedicated advanced assets. Although a specific section will be dedicated to discuss the specificity of assets, it is important to mention here how these centralized infrastructures owned by the international provider lead to higher visibility and better supervision of the whole network of the end customer, an increasing need in telecom industry as suggested by Bramson-Boudreau (2010). For all these reasons, outsourcing of these activities can results, as assessed by McIvor (2005), in improvements of performance.

Consistently with what assessed by Argyres (1996) and Poppo and Zenger (1998), outsourcing respectively enhances synergies and economies of specialization that lead to performance improvements.

Increasing synergies of the whole telecom group

What Argyres (1996) stated seems to apply also in terms of synergies. Customer technical support, service management, and customer care, resulted in this study as activities that requires a high level of collaboration between the wholesale operator and the local OBs of the group that provide coverage to the service provided by the group to the end customer. By internalizing these activities, the international provider is able to provide higher synergies between all the actors of the value chain (Bramson-Boudreau, 2010). By increasing synergies, also the performance of the service, both in terms of TTM and provisioning, and in terms of QoS, are expected to improve, accordingly to McIvor (2005).

Improvements in Technology Provisioning

This study highlighted also that the fact that telecom services are provided by only one operator may result as a driver for technology improvements. Service elements are provided by the international operator, which is itself provided by technology providers, with whom specific agreements or even alliances and partnerships are signed. There are two issues related to this topic.

Firstly, strong alliances between one single telecommunication operator and one single technology provider lead to closer collaboration or even co-development of technological solutions, enhancing technology innovation. Access to technology innovation is probably the most relevant consequence, as expressed by McIvor (2005).

Secondly, by concentrating volume of business, the international provider is able to play a more powerful role in the relation with technology providers, achieving economies of scale in provisioning and obtaining better economical conditions of the supply.

Again, technology issue seems to be aligned with the idea of Argyres (1996). According to his study, a firm may decide to go for outsourcing if it is proved

that the provider/supplier has superior capabilities, even if the related transaction costs are high. In this case, outsourcing decision not only provides improvements in term of quality and innovation, but also cost reduction thanks to the mentioned economies of scales in supply, as Poppo and Zenger (1998) stated in their study.

Cost reduction and economies of scale in value added activities

This study highlighted how outsourcing enhances reduction costs in activities like network monitoring and service management. In fact, consolidation of volume of activities in network operations centers dedicated to service management owned by only one provider does not only lead to economies of scope and specialization, as suggested by McIvor (2005), but also to economies of scale and cost optimization, as stated by Bramson-Boudreau (2010). This appeared to be in accordance to what found in the literature, specifically by McIvor (2005) and Poppo and Zenger (1998).This is the main reason why local OBs of the group, by externalizing value added activities are saving large amounts of money needed both for the initial investments as well for operations and maintenance of infrastructures (Bramson-Boudreau, 2010).

8.1.4 Exploitation of specific assets

By analyzing the phenomenon from the assets perspective, two are the main findings of this study.

Accordingly to what stated by the TCE theory and extended by Murray, Kotabe, and Wildt (1995), as well as by Poppo and Zenger (1998) in their interpretations of the RBV, marketing and commercial activities are not likely to be outsourced because of the high specificity of the involved assets. In other words, these activities have been identified as *human capital intensive*. Moreover, human resources dedicated to commercial activities have been identified as not re-deployable. Sales forces require a specific know-how of the local markets and the local end customers, in order to create strong and close relationships with the end customers. This appeared in this study as the main reason why local telecommunication operators are unwilling to externalize the mentioned activities. Reason that is also supported by Murray, Kutabe, and Wildt (1995)

when they assess that the higher the specificity of the assets involved in an activity, the worse its performance will be, if outsourced.

What emerged from this study regarding other activities, like performance measurement, service management, and customer care, is instead the other side of the same perspective: some activities are outsourced because the provider owns specific assets that are difficult to be re-deployed. Managing and monitoring global networks and global telecommunication services require dedicated investments, like dedicated customer care centers, maintenance centers and equipments, big and complex network operations centers as well as specific management software, as suggested also by Bramson-Boudreau (2010). All of these assets are very expensive and only high volume of business and consolidated experience along the time may justify the investment. Local OBs of the group neither have the knowledge nor the visibility to develop the same assets and achieve the same efficiency and effectiveness.

8.2 Outsourcing - Managerial implications

8.2.1 A global service requires a Single Point of Contact (SPOC)

One of the main reasons why local OBs are sourcing service management, performance monitoring, technical support, and customer care from international providers appeared to be the possibility of giving a single point of contact (SPOC) to the end customer, as already suggested by Thomas (2009) and Morrow and Vijayananda (2003). This SPOC will facilitate the relationship with the end customer by providing a unique interface for provisioning, technical support, and service management. In this scenario, the international operator seems to be the most appropriate actor to play this role. Previously high level of coordination within the various OBs of the group was required because each part was involved somehow in the control of the service.

The consequence of globalization

McIvor (2005) identified globalization as an enabling factor of outsourcing strategies. Outsourcing is more and more linked to the globalization because it allows corporations to take advantage of the opportunities presented while reducing the complexity of their own value chain (McIvor, 2005).

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The international operator of the group started developing unmanaged services as extension of the national telecom services. As suggested by Thomas (2009) as long as companies maintain local operations, local OBs were more likely to provide flexibility. Instead, the national service does not fit anymore the requirements of global services, with specific requirements of customer technical support, service management, network monitoring and reporting tools, and customer care.

This lead us again to what previously said: in this environment outsourcing is a driver to reduce complexity of business operations. The international operator is the ones more likely to achieve it. Again, the outsourcing strategy may be explained with the study of Argyres (1996).

8.2.2 Changes associated to outsourcing

Two main changes associated to outsourcing emerged by this study.

Firstly, as assessed by McIvor (2005), one of the consequences of outsourcing is the loss of skills. Local OBs have been externalizing activities like service engineering, network performance monitoring, and service management, to focus on more strategic activities that have been identified in marketing, sales and commercial relationships. This, accordingly to Bramson-Boudreau (2010) allows them to retain end customers and seek for new business opportunities at the same time. This also implies a shift in the skills required to carry out the business. In the specific case, the local OBs of the group are transferring network and service management know-how to the international provider.

The second issue, directly linked to the previous point, which emerged from this study, is related to the organizational changes associated to outsourcing. Organizational changes involve both of the entities: the local OB that externalizes some activities as well as the international provider that includes those activities as part of its business model. McIvor (2005) stated that organizations that do not recognize the organizational implications of outsourcing are more likely to fail their outsourcing strategies. The implications for the international provider related to outsourcing have been included in the scope of this study, and the results will be presented in the next section.

8.3   Service Development – Theoretical Implications

8.3.1   Design Stage of Service Engineering and Service Management

Service engineering, performance measurement and reporting, and service management have been identified as the most important activities of a managed telecommunication service. Moreover, these are the activities that imply the mayor changes in the development of the service with respect to the unmanaged ones as well as in the resources of international provider. Design of the solution, configuration of monitoring parameters, and SLAs definition require a high focus since the design stage of the NSD process.

Customer input

Accordingly to what stated by Britan and Pedrosa (1998), this study highlighted the importance of *customer input* for the design of the technical solution. Service engineering is the *service conceptualization* mentioned by Britan and Pedrosa (1998) in their study. Customer input allows understanding customer requirements, translating them into technical solutions and suiting the service to customer needs. Lastly, it drives customer satisfaction.

Still important, but not fundamental, appeared instead customer input for the development of performance monitoring, reporting, and service management. The reason has been identified in the fact that these are more back-end activities. Nevertheless, accordingly to Cooper et al. (1994), *customer focus* is necessary for the development of user friendly reporting tools and for the definition of accurate SLAs.

Network partners and technology providers' involvement

Another practice that emerged as fundamental for service engineering is the involvement of the partners in the development, as highlighted by Edvardsson and Olsson (1996), who took the perspective of partnerships and alliances in their analysis of NSD processes. Specifically, this study highlighted two different groups of partners that might be successfully involved in the development of the service.

- By increasing collaboration with local providers, international telecommunication providers may develop global services that are

compatible with the specific limitations of any of the local networks, enhancing flexibility of the solutions, responsiveness in provisioning, and service quality, identified by Morrow and Vijayananda (2003) and by Thomas (2009) as fundamental sources of competitive advantage.

- The involvement of technology providers resulted necessary for the effective and efficient development of service solutions and functionalities, because they are the ones that provide the technological elements that may or may not support the technological options required to satisfy customer needs.

Strategic definition

Bitran and Pedrosa (1998) included in their study of NSD processes the strategic dimension, by assessing the importance of consistency between the service and the strategic objectives of the organization. This study highlighted how the pillars of a managed service, which are service engineering, network and performance monitoring and reporting activities, and service management, are aligned to the strategic objectives of the international provider. Solution design and management of global services allow it to seek for "*meeting customer needs of international traffic and IP connectivity, to provide global scope and leverage presence in MNCs segment*", which is one pillar of the international operator's strategy.

8.3.2 The importance of analysis stage

This phase resulted to be the most relevant for any of the activities that are to be developed for the service. Particularly, it emerged from this study the importance of not limiting the analysis only to the market and financial issues, as assessed respectively by Edvardsson and Olsson (1996) and Cooper and de Brentani (1991), and as defined in the theoretical framework used by the author. Instead, it appeared essential to extend the analysis to the technological and organizational issues. This will be better discussed in the following sections and it will be referred as to feasibility analysis.

Competitors' analysis and market research

Once again, the activities for which accurate analyses resulted to be necessary are the pillars of the service: service engineering, performance monitoring and reporting, and service management.

According to Edvardsson and Olsson (1996), competitors' analysis is a necessary practice in the analysis phase of NSD processes for the definition of the offering. This study highlighted the importance of this practice for service engineering, because it allows understanding the offerings of the market, as well as positioning the service in the new segment with respect to the competition. This practice resulted to be even more important in the specific case of entrance in a new market segment.

As regarding reporting activities, market analysis has been identified as a relevant practice in terms of IT tools and applications that the market offers. Edvardsson and Olsson (1996) identified this practice along with the aforementioned competitors' analysis and included both of them in their study to evaluate how much the NSD is affected by marketing perspective. It emerged from this study how critical it is to align the offering to market trends and create a unique global offering of IT applications. Instead, less importance has been given to this dimension for the definition of network performance monitoring, identified as a back-end activity along the service life cycle.

For service management, market dimension resulted to be fundamental for the definition of commercial SLAs: competitors' analysis allows understanding what the market offers and positioning the service in terms of quality provided to the end customer.

Following Edvardsson and Olsson (1996) reasoning, customer technical support and customer care can be defined as more operative and less market driven with respect to the other activities analyzed in this study.

Feasibility analysis and Business case

This study highlighted the importance of feasibility analysis and development of a detailed business case. These practices, which have not been included by the author in the theoretical framework for the analysis, have instead been identified

by Morrow and Vijayananda (2003) as essential tollgates to decide whether the development of the solution is viable or not. Specifically, it emerged in this study the need to use these practices for the three pillars of managed telecommunication services. As suggested by Morrow and Vijayananda (2003) this study highlighted the importance of focusing on technological analysis. The most relevant limitations emerged in this study come from the infrastructure, intended as telecommunication network. From a technological perspective, it appeared much more impacting to adapt the infrastructure to the service than the way round. For this reason, the design of service solutions for managed services must be adapted to the existing infrastructures, both the one owned by the international provider and the ones owned by third party operators. In the same way, service management must be shaped on technological limitations. In other words, commercial end to end SLAs must be consistent with feasible technical SLAs. Finally, performance monitoring must be designed in a way that avoids network congestion and service degradation. Failures in understanding technological implications and limitations during the feasibility analysis may lead to poor quality service levels and, in a last instance, also to organizational inefficiencies.

8.3.3 Financial impact

The business case mentioned in the section above is the input for the financial analysis, which has been defined by Cooper and de Brentani (1991) as the practice to define the financial viability of the development of an activity or a whole service.

This study aimed to assess, in a qualitative way more than quantitative one, the financial impact in terms of capital expenditures and operational expenditures (hereinafter CAPEX and OPEX) of the activities required in the development and commercialization of a managed telecommunication service.

What emerged from this study is how highly automated activities impact on CAPEX more than on OPEX, while *human capital intensive* activities have higher impact on OPEX.

Service engineering requires dedicated human resources dimensioned on business volume for the design of service solutions to the end customer, which was not required as long as the solution was standard and sold with a pure wholesale business model. This requires higher OPEX for the international provider.

Network performance monitoring and reporting is the most automated activity and requires high investments upgrading processing capacity of IT systems, tools and applications, in order to provide accurate end to end KPIs. Thus, this activity has large impact on CAPEX.

Customer technical support and customer care have been identified as *human capital intensive* activities that require dedicated teams during operations and post sales phases. Nevertheless, they can be partially automated by investing respectively in automatic configurators and ERP and CRM systems. Thus they require both CAPEX and OPEX, although the financial impact has been identified as not relevant with respect to unmanaged telecommunication services.

Finally, service management resulted to be the most impacting activity both in terms of CAPEX and OPEX. Investment in infrastructures, international NOCs, advanced NMS, and network maintenance require high investments in CAPEX, as suggested by Bramson-Boudreau (2010). Moreover, service management requires dedicated human resources as well: service managers, operators of the NOCs, IT systems specialists, and technicians for incidents management and service maintenance. Thus, the impact in OPEX resulted very high.

The following figure is a qualitative representation of the impact in terms of CAPEX and OPEX that the organization is to face by providing a managed telecommunication service.
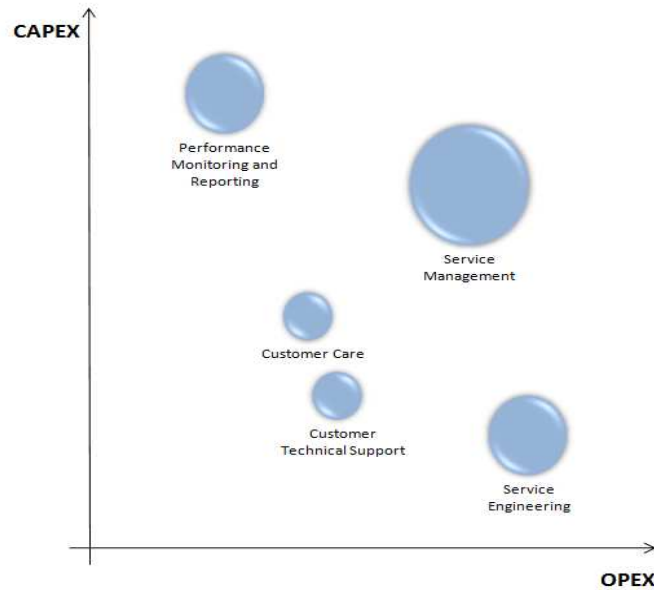
Figure 8-1: Qualitative representation of the financial impact of the activities of a managed telecommunication service

8.3.4 Impact on human capital

During the analysis of the organizational implications of the development of a new service, the intellectual dimension played in this study a relevant role. Specifically, it emerged from this study how diversity of human capital mentioned by Loch et al. (1996) is needed in the first phases of the NSD process and in those activities that contribute to the conceptualization of the service, meaning service engineering and service management. Instead, more operative activities performed in development phase, launch phase, and operations, require more specialized and dedicated resources.

Intellectual resources

Loch, Stein, and Terwiesch (1996) defined diverse creativity as the practice to involve a wide mix of human resources with different backgrounds for the conceptualization of the service. In this study the involvement in NSD of people from different areas of the organization appeared to be functional to guarantee consistency to the service. Marketing and commercial areas provide the input respectively from the market and from the customer, technical areas have to provide a feasible technological solution consistent with commercial requirements, network and operative areas must guarantee that the infrastructures are able to support the proposed technological solution, as well

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as IT and operations departments must respectively guarantee that IT systems guarantee an efficient management consistently with proposed SLAs.

Instead, it emerged from the study how operative activities like customer technical support and customer care must involve dedicated and specialized human resources to guarantee efficiency in operations.

Staff training and staff recruiting

Cooper et al. (1994) as well as Edvardsson and Olsson (1996) tried to evaluate the impact on NSD defining staff training as the dimension of analysis. If staff training is required, it means that the new service requires new capabilities, and there is a gap to be covered in terms of knowledge, know-how or experience. It emerged from this study the low impact that managed telecommunication services have on the existing human resources of the international provider. End to end managed telecommunication solutions do not require differential know-how with respect to unmanaged telecom services.

Instead, it emerged from this study the need of staff recruiting, a practice suggested by Bitran and Pedrosa (1998) as alternative to staff training, when the firm lacks of the needed human resources. According to the theoretical framework used by the author, the more the firm requires an increment in the current available human resources, the more impacting is the NSD with respect to the organization's structure (Bitran & Pedrosa, 1998).

Development and commercialization of end to end managed telecommunication solutions require an increment of human resources of the different areas of the organization. Two main reasons have been identified in this study:

- The increased business volume
- The increased complexity of the service itself.

Both of them appeared to be consequences of a common cause: end-to-end managed services imply a shift from a pure wholesale business model to the retail one. Besides the fact that the commercialization to the end customer is still maintained by local OBs, end-to-end service require a closer proximity of the international provider to the end customer, in any phase of the service life cycle, from the conceptualization to operations. Also in this case, the most

affected areas appeared to be the ones involved in these activities that have been identified as the three pillars of the new service.

8.3.5 Technological impact

Froehle and Roth (2007) stated the importance of identifying the technological resources involved in the NSD and evaluating the gap between the existing technology and the requirements of the future scenario.

Accordingly, the author identified the technological resources involved in a telecommunication service, generically divided into two macro-categories, IT systems and infrastructure, and assessed the impact on these resources in the development of end-to-end managed telecommunication services.

IT systems development

The higher impact in this case emerged from highly automated activities, like network performance monitoring, reporting, and service management. Accordingly to Froehle et al. (2000), this study highlighted the importance of upgrading IT systems, tools and applications to make them compatible with the requirements of the new service. Specifically, it emerged the fact that end-to-end managed telecom services, with respects to unmanaged services require two main features summarized below:

- More processing capacity to support end to end monitoring and management of infrastructure
- End customer orientation: tools and applications must be developed in a more customer oriented perspective

Again, it emerged from this study and from the ICT perspective the need of changing the organizational culture, to make NSD process and related practices more focused on the end customer, as suggested by Cooper et al. (1994). This is partly due to the closer proximity to the end customer required by end to end managed service, and partly to enhancing NSD effectiveness.

Infrastructure

No relevant implications have been identified in infrastructure, intended in this study as the set of telecommunication network and network operation centers. The reason might be found in the previous section of this study dedicated to

outsourcing. The end customer does not feel this process of outsourcing, which happens at the beginning of the value chain, between the wholesaler and local OBs of the same group. The end customer is always provided with managed service, meaning that telecommunication infrastructures are ready to support managed services. Implications of outsourcing of managed telecommunication services appeared since the beginning of the study more organization related than infrastructure related.

8.4 Service Development – Managerial Implications

Organizational resources have been defined by Froehle and Roth (2007) as the set of attitudes, personal relationships and management systems adopted by an organization and used as the link between intellectual and physical resources. This study highlighted the importance of organizational practices especially in the first phases of NSD process.

Internal Communication

Accordingly to Voss et al. (1992), it emerged the need of effective communication and close collaboration between all the areas involved in the NSD process. Specifically, the activities related to the first two phases of the service development process (design and analysis stages), service engineering, KPIs and SLAs definition, and service management, require high involvement of all the different functional areas of the organization. Technical department, PMOs, marketing departments, pre sales and commercial departments, IT systems, network, and operations have to be all involved in the process, for the effective definition of the solution. Nevertheless, it emerged from this study the risk related to bureaucratization of the process, which lead to paralysis and inefficiency along the development. It has been identified a trend: activities involved in the first phase of the NSD process require high level of inter-functional involvement, communication and collaboration; this inter-functional collaboration decreases progressively along the process, reaches a pick in the launch phase and decreases again during operations.

Managerial Support

The same path has been identified for managerial support, which has been suggested by Cooper and de Brentani (1991). Specifically, two relations have been identified in this study:

- The more the activity requires inter-functional collaboration, the higher managerial support is needed for effective development of the service
- Managerial support is needed in two precise phases of the NSD process. During the conceptualization, to assure strategic alignment of the process, and during the launch of the service, when the middle management plays the role of sponsor of the service.

The figure below shows a qualitative representation of the level of coordination and the managerial support that is needed along the phases of NSD process, as it resulted from this study.
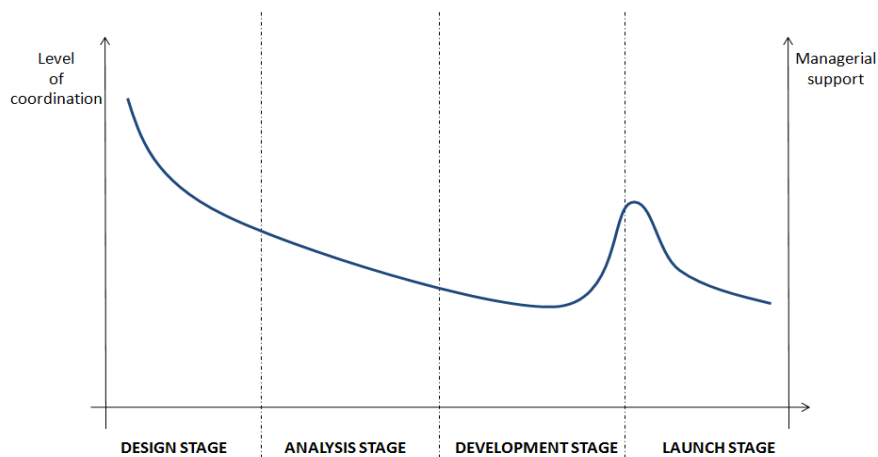

Figure 8-2: Qualitative representation of the level of coordination and managerial support required in the different phases of a NSD process

Management Systems

This study has finally identified the need of developing management systems and control practices to assure the readiness of the organization and to improve organizational performances along the NSD process. This result is aligned with the study of Frohele and Roth (2007), and it will be considered in the last chapter of this study as area of further research.

9 Conclusions

This last chapter will present the conclusions of this research. In the first section, the research questions presented in the third chapter will be recalled and briefly answered; in the second section, the main limitations identified by the author during the research, both from the theoretical and empirical viewpoint, will be shown; in the third and last section, the author will suggest topics and areas of further research that might be of interest and might also add valued to the study here presented.

9.1 Research Conclusions

The research questions presented in the third chapter of this study are represented here below with the aim of summarize how the author went through the process of answering.

- ✓ *Firstly, there will be a review of the literature concerning the outsourcing phenomenon, which aims to understand why local operators are requiring the outsourcing of the end-to-end service management to the international wholesaler.*

The study has highlighted how outsourcing strategy allows the achievement of synergies within the group in the development, provisioning and implementation of telecommunication services offered to multinational corporations. Moreover, economies of scale, economies of scope, and cost optimization may be achieved in a whole group perspective.

- ✓ *Secondly, the business model of managed services will be studied to identify all the activities that the international wholesaler has to internalize as consequence of the outsourcing phenomenon previously defined.*

As a consequence of this change in the internal structure of the group, the international wholesaler is required to internalize service engineering, network monitoring and reporting, customer technical support, service management, and

customer care, while marketing, sales, and commercial relationships will be maintained by the local operators of the group.

✓ *Finally, the service development process will be studied in order to assess what the implications of this trend are in the development process of an international wholesaler.*

The international wholesaler will increase the volume of its operations, with consequences of the main resources owned by the company. More human resources will be required due to the increment of volumes but also to the increased complexity of internal operations. Technical resource will require upgrades in terms of IT processing capacity and orientation to end customer. Organizational resources will require improvements in terms of service development processes, managerial support, coordination between operative areas, and management systems. Financial resources will be impacted both in terms of capital and operational expenditures.

The validity of the answers provided to the research questions lies on the framework that has been developed after a detailed and comprehensive literature review of the outsourcing phenomenon and on the NSD theories. The framework supported and addressed the data collection and the data analysis and the reliability of the empirical analysis has been given by the cross-functional study. Moreover, the validity of the answers is provided by the day by day involvement of the author in the business and working processes that lead the department where the author carried out the study to define the "to be" scenario.

9.2 Study limitations

There are three main limitations that have been identified by the author in these five months of research.

The first one is related to the theoretical background of the research. After a comprehensive review of the literature related to outsourcing, the author developed a theoretical framework mainly based on TCE and RBV perspective to analyze the phenomenon. After the empirical analysis, the author identified a perspective that had not been included in the framework and might have been

contributed to the research: the importance of politics in making strategic decisions in a company like Tele Spain Group. Besides the theories that focus on transaction costs, assets optimization, achievement of efficiency and effectiveness through outsourcing strategies, it appeared from this study that some decisions are not driven by organizational performance improvements but by politic and strategic issues that might apparently go against what defined by the theory. This is even truer in the specific case of a large corporation composed by many independent companies, where decisions are taken in the perspective of Whole Corporation and not in the single perspective of two or few entities of the same.

The second limitation comes from the single case study approach. Although the author opted for an embedded case study, and a cross-functional research involving six different units of analysis to make the study more comprehensive and more reliable, Yin (2003) suggests to avoid single case study analysis and go for multiple case studies research to increase the reliability of the results. The impossibility to make a multiple case-study analysis mainly comes from two barriers. Firstly, the strategic importance of some topics touched in this research did not allow the author to have access to external information related to the competitors to benchmark the results obtained in this organization with the ones that might have been obtained in other similar organizations. Secondly, time limitation did not allow the author to extend the analysis to further contexts.

The third limitation is structural and related to the first one. The study has been performed in a very particular company, which plays a specific role within the corporation. Probably it does not exist any other corporation with an independent company that might be compared to TW; this limits the generalizability of the study to other contexts.

9.3 Future research

The author identified two main areas that might be of interest for further analysis.

Firstly, it would be interesting to replicate the same study in another telecommunication company which does not have the same structure of the one here analyzed, but which has been facing the same process of development of managed telecommunication service for corporations.

Secondly, it would be of interest to extend the study to the further step of telecommunication outsourcing. The trend of telecommunication industry that serves the segment of corporations seems to go towards total outsourcing. It means that organizations will not be requiring single telecommunication services but instead they will be asking telecom service and network providers to be provided with a full package of total managed products and services according to their specific needs. This implies a substantial change in the products and services portfolio of telecommunication companies. In fact, instead of having a portfolio of single services, each one independent from the other, the portfolio would be composed of highly integrated and modular services, and this would turn out to have relevant implication in service development.

10 References

Abraham, K., & Taylor, S. (1996). Firm's use of outside contractors: Theory and evidence. *Journal of Labuor Economics* , 394-424.

Ahn, J., & Skudlark, A. (2002). Managing risk in a new telecommunications service development process through a scenario planning approach. *Journal of Information Technology, 17* , 103-118.

Argyres, N. (1996). Evidence on the role of firm capabilities in vertical decisions. *Strategic Management Journal, 17* , 129-150.

Aubert, B. A., Rivard, S., & Patry, M. (1996). A transaction cost approach to outsourcing behavior: some empirical evidence. *Information & Management, 30* , 51-64.

Barney, J. B. (1991). Firm resources and sustained competitive advantage. *Journal of Management, 17 (1)* , 99-120.

Barney, J. B. (1986). Organizational Culture: Can it be a sustained competitive advantage? *Academy of Management Review, 11* , 656-665.

Bitran, G., & Pedrosa, L. (1998). A structured product development perspective for service operations. *European Management Journal, 16 (2)* , 169-189.

Bramson-Boudreau, E. (2010). *Telecom Managed Services: Network Outsourcing Enters its third phases.*

Coase, R. H. (1937). The Nature of the firm. *Economica, Vol. 4* .

Collis, J., & Hussey, R. (2009). *Business research: a practical Guide for undergraduate & postgraduate students.* New York, NY: Palgrave MacMillan.

company's documents. *Marketing Manual of MPLS VPN Service.*

Cooper, R. G., & de Brentani, U. (1991). New industrial financial services: what distinguishes the winners. *Journal of Product Innovation Management, 8 (2)* , 75-90.

Cooper, R. G., Easingwood, C. J., Edgett, S., Kleinshmidt, E. J., & Storey, C. (1994). What distinguishes the top performing new products in financial Services? *Journal of Product Innovation Management, 11 (4)* , 281-299.

Dyer, J. H., & Singh, H. (1998). The relational view: cooperative strategy and sources of inter-organizational competitive advantage. *Academy of Management Review, No. 23* , 660-679.

Edvardsson, B., & Olsson, S. (1996). Key Concepts for new service development. *The Service Industries Journal, 16 (2)* , 140-164.

Emerson, R. M. (1962). Power-Dependence Relations. *American Sociological Review, Vol. 27* , 31-41.

Eric, W. H. (2000). Transaction cost and resource-based explanations of joint ventures: a comparison and synthesis. *Organization Studies, Vol. 21* , 215-242.

Espino-Rodriguez, T. F., & Padron-Robaina, V. (2006). A review of outsourcing from the resource-based view of the firm. *International Journal of Management Reviews, vol. 8* , 49-70.

Froehle, C. M., & Roth, A. V. (2007). A Resource-Process Framework of New Service Development. *Production and Operations Management, Vol. 16, No. 2* , 169-188.

Froehle, C. M., Roth, A. V., Chase, R. B., & Voss, C. A. (2000). Antecedents of new service development effectiveness: An exploratory examination of strategic operations choices. *Journal of Service Research, 3 (1)* , 3-17.

Gilley, K. M., & Rasheed, A. (2000). Making more by doing less: analysis of outsourcing and its effects on firm performance. *Journal of Management, Vol. 26* , 763-790.

Goles, T., & Chin, W. (2002). Relational Exchange Theory and IS Outsourcing: Developing a Scale to Measure Relationship Factors. *Information Systems Outsourcing* , 221-250.

Gottfredson, M., Puryear, R., & Phillips, S. (2005). Strategic Outsourcing: from periphery to the core. *Harvard Business Review* , 1-10.

Grant, R. M. (1991). The resource-based theory of competitive advantage: implications for strategy formulation. *California Management Review, 33* , 114-135.

Harrigan, K. (1985). Strategies for intrafirm transfers and outside sourcing. *Academy of Management Journal, 28* , 914-925.

Jennings, M. C. (2000). Scenario Planning a useful tool for health care's uncertain times. *Health Care Strategic Management, 18 (10)* , 15-17.

Johnson, S. P., Menor, L. J., Roth, A. V., & Chase, R. B. (2000). *A critical evaluation of the new service development process in New Service Development.* Thousand Oaks, CA: Fitzsimmons editor.

Lee, J. N., Huynh, M. Q., Kwok, R. C., & Pi, S. (2003). IT Outsourcing Evolution: Past, Present, and Future. *Communication of ACM* , 84-89.

Loch, C. H., Stein, L., & Terwiesch, C. (1996). Measuring development performance in the electronics industry. *Journal of Product Innovation Management, 13 (1)* , 3-20.

Loh, L., & Venkatraman, N. (1992). Determinants of Information Technology Outsourcing: A cross-sectional Analysis. *Journal of Management Information System* , 7-24.

McIvor, R. (2000). A practical framework for understanding the outsourcing process. *Supply Chain Management: An internal Journal, 5* , 22-36.

McIvor, R. (2005). *The Outsourcing Process - Strategies for Evaluation and Management.* New York: Cambridge University Press.

Mello Veiga, F. (2010). *Telefonica International Wholesale Services.* Ovum Research.

Morrow, M., & Vijayananda, K. (2003). *Developing IP-based Services: solutions for service providers and vendors.* San Francisco, CA: Morgan Kaufmann Publishers.

Mullins, J. W., & Sutherland, D. J. (1998). New product development in rapidly changing markets: an exploratory study. *Journal of Product Innovation Management, 15* , 224-236.

Murray, J. Y., Kotabe, M., & Wildt, A. R. (1995). Strategic and financial implications of global sourcing strategy: a contingency analysis. *Journal of International Business Studies, 1st Quarter* , 181-202.

Osterwalder, A., & Pigneur, Y. (2002). An e-Business Model Ontology for Modeling e-Business. *Electronic Commerce Conference .* Bled, Slovenia.

Pfeffer, J. (1981). *Power in Organizations.* Marshfield, MA: Pitman.

Poppo, L., & Zenger, T. (1998). Testing alternative theories of the firm: transaction cost, knowledge based, and measurement explanations for make-or-buy decisions in information services. *Strategic Management Journal, 19* , 853-877.

Porter, M. (1985). *Competitive advantage: Creating and sustaining superior performance.* New York: The free press.

Quinn, J. B., & Hilmer, F. G. (1994). Strategic Outsourcing. *Sloan Management Review* , 43-55.

Reidehbach, R. E., & Moak, D. L. (1986). Exploring retail bank performance and new product development: A profile of industry practices. *Journal of Product Innovation Management 3(3)* , 187-194.

Roth, A. V. (1993). *Assessing performance in service organizations in Service Superiority: The design and Delivery of Effective Service Operations.* Warwick, UK: Warwick Printing.

Rothery, B., & Robertson, I. (1996). Outsourcing. *Editorial Limusa* .

Schoemaker, P. J. (1995). Scenario planning: a tool for strategic thinking. *Sloan Management Review, 36 (2)* , 25-40.

Schulte, C. (1995). *Logistik.* Munich, 2nd edition: Vahlen.

Shostack, G. L. (1984). Service design in the operating environment in Developing New Services. *American Marketing Association* .

Silverman, B. S. (1999). Technological resources and the direction of corporate diversification: toward an integration of the resource-based view and transaction cost economics. *Management Science, 45* , 1109-1124.

Stähler, P. (2002). *Business Models as Unit of Analysis for Strategizing* . Lausanne, Switzerland: International Workshop on Business Models.

Strange, R. (2009). The outsourcing of primary activities: Theoretical analysis and propositions. *King's College of London* .

Thomas, B. (2009). *Managed Global MPLS Services.* Forrester.

Timmer, P. (1998). Business Models for electronic Markets. *Journal on Electronic Markets, vol. 8 (2)* , 3-8.

Van Maanen, J. (1983). *Qualitative Methodology.* London, UK: Sage.

Voss, C. A., Johnston, R., Silvestro, R., Fitzgerald, L., & Brignall, T. J. (1992). Measurement of Innovation and design performance in services. *Design Management Journal, 3* , 40-46.

Weill, P., & Vitale, M. R. (2001). *Place to Space: Migrating to eBusiness Models.* Boston: Harvard Business School Press.

Wernerfelt, B. (1995). The resource-based view of the firm: ten years after. *Strategic Management Journal, 16* , 171-175.

Williamson, O. E. (1981). The Modern Corporation: Origins, Evolution, Attributes. *Journal of Economic Literature, Vol. XIX* , 1537-1568.

Williamson, O. E. (1979). Transaction-Cost Economics: the Governance of Contractual Relations. *Journal of Law and Economics, Vol. 22* , 233-261.

Wulf, J., & Zarnekow, R. (2009). Business Models for the IP Based distribution of Services. *Working Paper of Technische Universitat Berlin* .

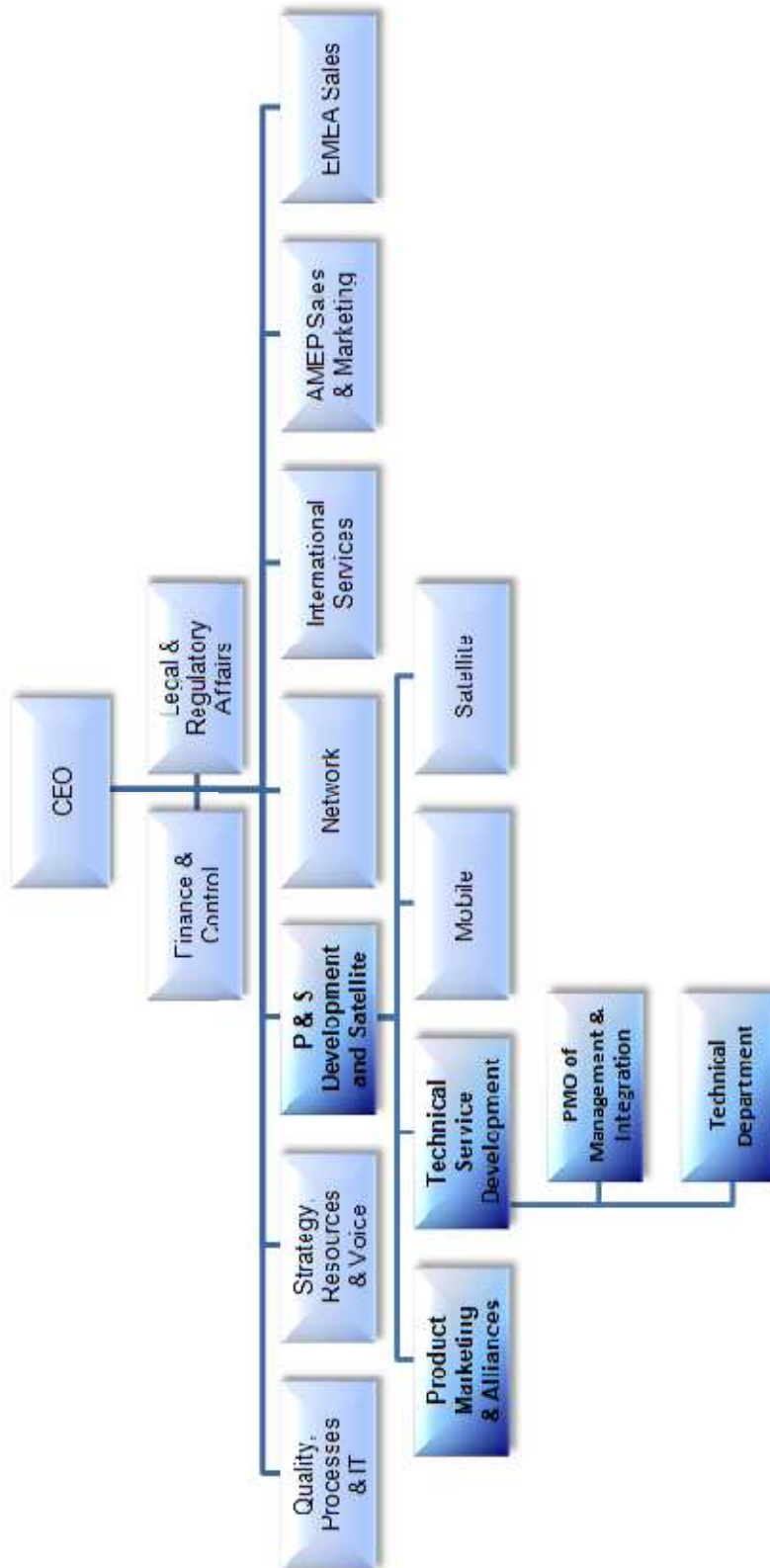Yin, R. K. (2003). *Case Study Research: design and methods.* Sage Publications, Inc.

11 Appendixes

Appendix A   **Organizational Structure**

Appendix A.1   **Tele Spain Group Organizational Chart**
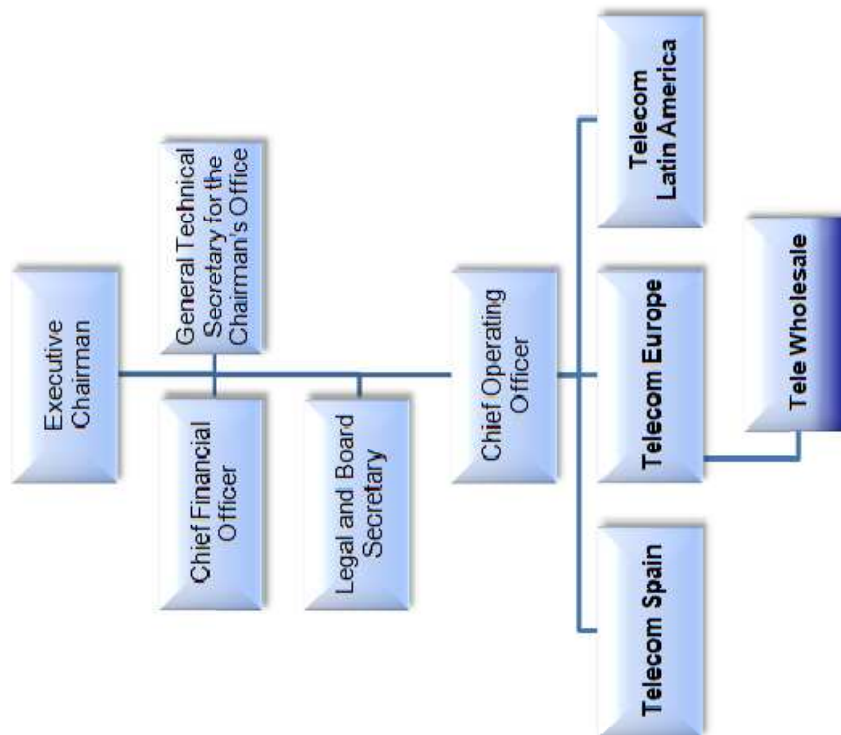
Appendix A.2   TW Organizational Chart

Appendix C   **Interviews**

Appendix C.1   **Table of people interviewed**

Company	Department of the candidate	Date
TW	PMO of Mngmt & Integration	09/05/2011
TW	PMO of Mngmt & Integration	16/05/2011
TW	PMO of Mngmt & Integration	18/05/2011
TW	Technical Department	11/05/2011
TW	Technical Department	11/05/2011
TW	Technical Department	12/05/2011
TW	Product Marketing	13/05/2011
TW	Product Marketing	18/05/2011
TW	Product Marketing	23/05/2011
TW	Operative Marketing (Sales)	12/05/2011
TW	Operative Marketing (Sales)	16/05/2011
TW	IT Systems and Processes	12/05/2011
TW	IT Systems and Processes	17/05/2011
TW	Network	18/05/2011
TW	Network	23/05/2011

Appendix C.2   Template of Interview on Outsourcing

The scope of the first part of the interview is to understand the reasons why the local operators are externalizing to TW, in quality of international wholesaler, activities like service management and reporting to end customer. This implicitly makes the international provider closer to the end customer, which apparently contrasts with the wholesale business model, where the wholesaler uses the retailer as a commercial channel.

This is the template of the interview; the questions presented below were only the starting point, the guide for the interviewer, who was then free to widen the interview by making more specific questions to go deeper into the topic, according to the flow of the each conversation.

1. What are the main reasons why local operators are requiring managed MPLS VPN Service, determining a shift from unmanaged to managed telecommunication services?

McIvor (2005) identifies in his book "The Outsourcing Process - Strategies for Evaluation and Management" the potential benefits that might be achieved with outsourcing: cost reduction, performance improvement, flexibility, specialization, and access to innovation.

2. According to what previously said, what are the potential benefits that could be achieved with a managed MPLS VPN Service?

Quinn and Hilmer (1994) define core competences not only as the ability to make a product or a service relatively well, but as the activities that a firm is able to perform better than its competitors, thus enabling it to achieve competitive advantage.

3. The activities that are required to develop, sell, install, and manage a telecommunication service have been divided into Marketing, Sales and Customer Relationship, Service Engineering, Customer Support, service Management and Customer Care. According to the previous definition of Queen and Hilmer (1994), what are among these the core competencies of a local telecommunication provider (intended as the retailer of the service)?

4. According to the same definition, and with respect to the activities identified above, what are the core competencies of TW (intended as the international wholesaler)?

Provider's capabilities are considered a driver when an organization wants to outsource an activity. Outsourcing is more likely to happen, and management is more willing to go for it, if the suppliers are known to have better know-how in providing the same activities.

5. Provided that TW performs or potentially may perform any of the following activities, which are the ones that TW would perform better?

An asset is specific when it needs non re-deployable physical or human investments that are specialized for a unique task.

6. What are the main assets (human capital, IT systems, infrastructures, processes) that are required for each of the following activities? According to the previous definition of asset specificity, can these assets be considered specific for these activities?

7. Is it possible, for the mentioned activities, to achieve economies of scale in TW? If yes, how? How much would it be the impact of cost reduction if externalized?

Appendix C.3   Template of Interview on NSD Process

The scope of the second part of the interview is to assess the impact that these activities might have in TW if developed as part of the Service. The objective is to understand the areas involved in these activities, the implications of the development, and the impact on the resources of the company (financial, technological, human, and organizational).

This is the template of the interview; the questions presented below were only the starting point, the guide for the interviewer, who was then free to widen the interview by making more specific questions to go deeper into the topic, according to the flow of the each conversation.

Customer input has been identified as a driver of effectiveness in NSD process. It is intended as the influence that customers play during the initial conceptualization.

1. How much important is the customer input (end Customer) in the development of the following activities: service engineering, performance measurement and reporting, customer support, service management, and customer care? How can a customer influence this development?

The 5 pillars of TW's Strategy are:

a) *To gather inbound international traffic, providing a single interface for international carriers wherever the group has presence.*

b) *To act as the group's international carrier to meet all the international traffic needs.*

c) *To provide international IP connectivity for the group's local internet service providers through its international backbone.*

d) *To maximize return on existing assets (OPEX and CAPEX management) fostering the group's synergies.*

e) *To provide global scope to all fixed and mobile services for MNCs and for new innovative services that can leverage in its global presence.*

2. How much are the mentioned activities related with the overall strategy of the company? Is their development consistent with the overall strategy?

3. How much important is to make a competitors' analysis and a market research (strategies and offerings) for the definition and development of the mentioned activities during the analysis stage of the service development process? How?

The financial impact is the output of a financial analysis that is necessary to define the financial or economic viability of the activity. It gives an inch on the financial effort that the organization has to undertake during the NSD process and it is directly related to the financial resources of the firm.

4. What is the financial impact of the development of the mentioned activities? How can it be evaluated?

Technology of this service can be divided into the following main categories: network infrastructure, service elements (CPEs, gateways, routers) and IT supporting tools (Infoweb, Infovista, Sigma).

5. Which of these categories are required for the development of the mentioned activities? How do you evaluate the impact on these activities in terms of technological gap to be covered?

6. With respect to the current status of the human resources available in TW (current know how, capabilities, background of HR), do the development and the performance of the mentioned activities require staff training? If yes, what kind of training? And for which areas of the company?

7. With the same perspective, do the development and the performance of the mentioned activities require staff recruiting? If yes, which areas would be involved?

8. With respect to the current status of the service development process in TW, are there standardized processes to support the development of the mentioned activities? How much effort would require the standardization of processes to support these activities?

Diverse creativity has been defined as the practice to cultivate and utilize a wide mix of intellectual sources for the generation of ideas as well as for implementation of the NSD. In order to evaluate the impact on the intellectual resources in NSD, this dimension has been used as variable of analysis to identify the intellectual resources (technical/technological/commercial knowledge and background of the involved actors) required for the development of the activity. The following areas have been identified as the ones involved or affected by the service development: product marketing, operative marketing, PMO of integration, technical department, IT, Network, processes, and pre-sales.

9. What is the human capital required for the development of the mentioned activities? What are the areas involved in it? What is the level of involvement required by each department? What is the level of coordination that the areas identified previously have to maintain?

Management has been divided in three levels: first line management, middle management (department), and top management (division).

10. What is the managerial support that is needed for the development and the performance of the mentioned activities?

Edvardsson and Olsson (1996), as well as Bitran and Pedrosa (1998), identified another fundamental practice which is customer training. Customer training is essential for the success of the service and the impact on the NSD process might be defined as the amount of resources and the effort that a firm must dedicate to the first approach with the customer while launching the specific service or functionality

11. Do the mentioned activities require a specific program of customer training (retail customer)? What is the level of customer training required?

12. With the same perspective, do the mentioned activities require a specific program of end customer training? What is the level of customer training required?