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Master of Science in
Management, Economics and Industrial Engineering

"An Analysis of the European Telecommunications Strategic Environment: How Can Strategic Actions Be Defined to Adapt to the New Scenario?
A Telefónica Case Study"

Supervisor: Prof. Alberto Portioli Staudacher
Assistant Supervisor: Prof. Mercedes Grijalvo

Master Graduation Thesis by: Gabriele Albini
Student Id. number: 776384

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Sommario

La ricerca consiste in un'analisi dell'ambiente strategico rappresentato dal settore delle telecomunicazioni europeo con un'attenzione particolare ai tre macro-cambiamenti che hanno influenzato la storia del settore: primo, il passaggio da un mercato caratterizzato da monopoli governativi ad un mercato privatizzato, secondo, l'introduzione di leggi - chiamate Eurotariff - volte a limitare il prezzo e regolare il traffico mobile in Europa e infine, la costante crescita della domanda di traffico internet, a discapito della domanda di traffico voce, dovuta al successo degli OTTs (Over-the-Tops) e all'introduzione delle applicazioni NGN (Next-Generation Network).
Tali cambiamenti hanno contribuito ad aumentare la competizione in un settore organizzato in monopoli e stanno imponendo alle compagnie di adattarsi ai nuovi bisogni dei consumatori. La ricerca studia il caso reale rappresentato da Telefónica: dopo una presentazione della compagnia e del processo di deregolazione, si definiscono le conseguenze dell'analisi dell'ambiente strategico e propongono alcune azioni strategiche, con l'obiettivo di adattarsi al nuovo ambiente.

La metodologia seguita si basa su uno studio di modelli esistenti in letteratura progettati per analizzare l'ambiente strategico. I migliori sono applicati al caso reale, riguardante Telefónica: i risultati ottenuti si considerano infine il punto di partenza per definire le azioni strategiche.

L'obiettivo della ricerca è in realtà duplice: da un lato offrire una presentazione del business delle telecomunicazioni con un'attenzione particolare ad alcuni fenomeni: Eurotariff, OTTs e NGN; in secondo luogo, mostrare una procedura efficace per analizzare un ambiente strategico, concentrando l'attenzione sui cambiamenti principali e su come le relative conseguenze possono essere dedotte. Le informazioni ottenute da questo tipo di studio sono molto importanti per un'impresa poiché permettono di capire cosa va cambiato per adattarsi al nuovo ambiente strategico, ottenendo così prestazioni migliori.

Parole Chiave

Telecomunicazioni, Analisi dell'ambiente strategico, Eurotariff, Telefónica, NGN.

Abstract

This research presents an analysis of the European Telecommunication strategic environment with particular focus on the three macro-changes which have been influencing the recent history of such industry. These are, first of all, the shift from a government-controlled market to a privatized market. Second, the introduction of price limitations - called Eurotariff - which are supposed to regulate the mobile traffic throughout Europe. Finally, the constant growth of data and internet traffic demand, compared to the voice traffic demand, mainly due to the success of OTTs (Over-the-Tops) and the introduction of NGN (Next-Generation Network) applications and software.
Such changes have increased the competition in an industry which was organized in monopolies and are forcing the companies to change, following the different customers' needs. Throughout the essay, a case study about Telefónica has been developed: after a presentation of the company and of Telefónica's deregulation process, the consequences of the environment analysis will be defined and, finally, some strategic actions will be proposed in order to adapt to the new strategic environment.

The methodology which has been followed consists in a research on the models existing in literature designed to analyze the strategic environment. The best ones have been used and applied to the real case, involving Telefónica: the findings obtained have then been considered the basis to define the strategic actions.

The purpose of the paper is twofold: first of all to offer an understanding of the telecommunications business with a particular focus on the Eurotariff, OTTs and NGN phenomena; second to show how a strategic environment can be effectively studied, focusing on the changes that characterize the industry, and how the consequences can be deduced. The information coming from this type of studies is very important for a company to understand what to change in order to adapt to a new context and achieve better performances.

Keywords

Telecommunications, Strategic Environment Analysis, Eurotariff, Telefónica, NGN.

Note of The Author

This research has been developed while doing an internship in Telefónica, Madrid.

The company's name, the real facts and data which have been included in the research involve Telefónica; they were allowed to be used by the Legal department of the company due to the cultural and academic purposes of the research.

The reader is therefore invited to use the information contained in this research for cultural and academic purpose. NO different purposes are allowed.

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Any feedback, comment, constructive criticisms or request is highly appreciated.

Feel free to contact the author!

e-mail: gabri.albini@gmail.com

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This thesis is dedicated to my family.

They are my idea of love;

Thanks to them I am aware of how lucky I am.

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List of Acronyms & Abbreviations

Acronym	*Meaning*
1Q, 2Q, 3Q, 4Q	First/ Second/ Third/ Fourth Quarter
2G,3G,4G	2nd, 3rd, 4th Generation
ADSL	Asymmetric Digital Subscriber Line
AMEP	America & Pacific
ANSA	Official Italian news agency (Agenzia Nazionale Stampa Associata)
Arcep	Autorité de régulation des communications électroniques et des postes
B2B	Business-to-Business
B2C	Business-to-Customer
CEO	Chief Executive Officer
CSF	Critical Success Factors
CTNE	Compañía Telefónica Nacional de España
DDoS	Distributed Denial-of-Service
DL	Download
EMEA	Europe, Middle-East and Africa
ERP	Enterprise Resource Planning
EU	European Union
FCC	Federal Communications Commission
FTTB	Fiber-to-the-building or Fiber-to-the-basement
FTTH	Fiber-to-the-home
FTTS	Fiber-to-the-street
FTTx	Fiber to the x
GB	Gigabyte
GDP	Gross Domestic Product
ICT	Information and Communications Technology
IP	Internet Protocol
LATAM	Latin America
LTE	Long Term Evolution
M2M	Machine to machine
MB	Megabyte
MMS	Multimedia Messaging Service
MTR	Mobile termination rates

MVNO	Mobile Virtual Network Operator
NGN	Next Generation Network
Nr.	Number
OTT	Over The Top
PO	Public offer
PSTN	Public switched telephone network
QR Code	Quick Response Code
R&D	Research & Development
RCS	Rich Communications Services
RETD	Red Especial de Transmisión de Datos
SCP	Service Control Point
SDP	Service Data Point
SIM	Subscriber Identity Module
SMS	Short message service
TB	Terabyte
Telco	Telecommunications
TGS	Telefónica Global Solutions
U.K.	United Kingdom
U.S.	United States (of America)
UL	Upload
VAT	Value added tax
VoIP	Voice over IP
Wi-Fi	Wireless Fidelity

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1. Introduction

This Master Thesis will present an analysis of the European Telecommunications strategic environment. The findings from such analysis have been used as a basis to identify the macro-trends and changes which are influencing the market and differentiating it from the past.
The goal of this thesis is twofold: on the one hand, an understanding of the phenomena which are affecting the European Telecommunications market will be provided; these are: the VoIP (Voice over IP) technologies offered by the OTTs (Over-the-Tops) and the introduction and the consequences of the Eurotariff. On the other hand, the consequences deduced from the existing phenomena will be used to define how companies should adapt their strategy to the new scenario, showing, in particular, a case for a specific company within the industry: Telefónica.
Indeed, a fundamental question will be formulated after the study of the phenomena: this is whether Telecommunications services will be still provided and sold to the customers in the way which it is adopted today.
In order to face a possible different market scenario, companies need to adapt and implement some changes to the way they are working and are used to work: literature presents many examples of unsuccessful strategies, which failed in adapting to the changes of an environment. That is why a part of the paper will be therefore dedicated to the study of the consequences the new environment features have on the companies.

The scientific research was conducted starting from the studies of the existing models of market analysis and strategy management, available in the industrial management literature.
Besides, the main source of practical data and information which are supporting the research is coming from an internship experience, performed in the sales area of a business unit of one of the biggest telecommunication companies worldwide: Telefónica.
Thanks to the merging of significant findings both from the literature and from the company's data, the current fast changing scenario of the telecommunication market has been pictured, showing some relevant information and trends. Besides, the findings obtained have been linked to the internal information coming from Telefónica - the last part of the thesis is therefore dedicated to the presentation of the strategic actions, aimed at adapt the way of working of Telefónica.

The Master Thesis is organized in seven different chapters: the research begins with this introduction-chapter, showing the object of research and the contents.
The second chapter is dedicated to describe the Telecommunications market background: this market has a long and interesting history whose consequences can still be found in the current scenario. The first part of the chapter shows the early history of the market, which was characterized by

monopolies; then, companies were liberalized, throughout a deregulation process. This will be described for two real cases: Telefónica and Telecom Italia.
The second part of the chapter is instead dedicated to the new market configuration in which monopolies were replaced by a general open competition.

In the third chapter, the context of analysis will be presented: the paper has been based on the information obtained during an internship semester in Telefónica Global Solutions. Telefónica is a major player in the telecommunication market and this part of the thesis is dedicated to the description of the company, with particular focus both on the business and on the way of working of Telefónica Global Solutions.

The forth chapter presents a detailed description of the research methodology adopted. Information about the research question, the research paradigm, approach and methodology, as well as a classification of the research and the description of the sources used will be provided in this chapter.

The fifth chapter is dedicated to the literature review: the sources, models, frameworks found in the literature and used for the research will be described and explained. The purpose is to build a theoretical basis on which to build the three main parts of the scientific research: the strategic environment analysis, the analysis of the consequences on the strategy and finally the strategic actions linked to the findings obtained.

The sixth chapter is dedicated to the research: the first part - the telecommunications strategic environment analysis - is the only part which is general and is not specific for Telefónica. The two remaining parts are aimed at defining the linkages between the environment and the strategy of Telefónica. Therefore, the research findings coming from the two topics have been presented as two parts of the Telefónica case study.

The seventh chapter presents the conclusion of the paper, consisting in a description of both results and limitations of the analysis made.

Additional parts have been added at the end of the Master Thesis: the first one contains the bibliography used and the second contains the appendix.

2. The Telecommunications Market Background

The purpose of this chapter is to present a complete background of the Telecommunications (Telco) market in Europe. In the first part, the history of such market is described: the Telco market current scenario has a very long and particular history which was worth to be described. Second, the main features of the contemporary competitive scenario will be described.

2.1 History and Monopolies

Many of the current MVNOs (Mobile Virtual Network Operator), such as Telefónica, Telecom Italia, British Telecom, etc., originally, have been benefiting from a privileged position for long time. Taking Telefónica as an example, indeed, since 1884 - before Telefónica's birth - with royal decree, the Spanish state controlled a monopoly over the telecommunication industry: Telefónica was the only company who could offer such services by law.
The Spanish one was not the only monopoly in Europe: the majority of the developed European states have been controlling the Telco services throughout monopolies.
A definition of monopoly is (Oxford University Press, 2008):

"the exclusive possession or control of the supply or trade in a commodity or service"

The Telco companies which were born in each country, leading the monopolies, are called incumbent operators. In the appendix (section A), a complete list of all the incumbent operators Europe is presented.

Today the Telco market is completely different: very competitive and with many operators and choices for the customers of each country. The process of liberalization of such market has been very long and was initiated by the U.K. and the U.S at the beginning of the '80s (Telecom Italia, 2012).

The supply of daily-used services, such as energy consumption or Telco services, has been believed to be of public importance so that only big and reliable companies, with a high investing capability, could afford to manage them.
During the '80s in the U.K. and the U.S. this vision changed: with the technological evolution and the increasing market saturation, monopolies were seen as an obstacle to the growth of the Telco industry: an open competition would have brought a decease on prices and an increase in efficiency, stimulating the innovation.

The official starting point for the *deregulation* process in Europe was between the end of 1997 and the beginning of 1998, when the European Union published the *green paper*, containing a collection of new standards and proposals for the gradual liberalization of the Telco market (Telecom Italia, 2012). Every European country answered to the new directive independently. However, similar behaviors to implement adaptation could be found across the countries: the result is that, since the years '00s, the European Telco market can be considered completely free and open to competition (Bijwaard et al., 2004).

The following paragraphs are dedicated to two case studies, showing two similar examples of how companies went across the *deregulation* process. The first company taken as example is Telefónica: this is the first part of a broader case study about the company which will be developed across the whole research. The second short case study is about Telecom Italia.

2.1.1 Telefónica Case Study – Part I: The Deregulation Process

Telefónica is a Telco company which was born in 1924 in Madrid, Spain where its headquarter is still located.

Telefónica, originally, was born under a different name, CTNE (Compañía Telefónica Nacional de España) and it has been benefiting from a privileged position for long time: Telefónica has been the leader in a monopoly over the Telco Spanish market in the period 1924-1996. After such period, the market was completely liberalized and the monopoly disappeared: the main events which lead to this situation are described in this first part of case study.

Since 1884, the state of Spain, although controlling a monopoly over the Spanish Telco industry, was unable to provide the services due to lack of competences and infrastructures, therefore it has always licensed private companies with the permission to provide the services in exchange of a payment of 10% over the gross income.

In particular, in 1920, with the purpose of *modernize* the country, the state gave a twenty year concession to ITT, the International Telephone and Telegraph Co., over the Telco monopoly. ITT represented the major shareholder of a group of companies which founded CTNE and, therefore, CTNE was the only company operating and managing the national and international Telco services throughout the country. As a matter of fact, from 1924 to 1944, the telephone service in Spain was provided just by Telefónica, the only player in a private owned monopoly.

Later on, in 1944, the Telco monopoly became publicly controlled due to the instable and dangerous historical context: Telco infrastructures were damaged as a consequence of the Civil War and the materials, useful to fix them, were impossible to find during World War II.
In the same period the Spanish state, guided by Franco, managed to buy 80% of ITT's shares, becoming the new main shareholder (although owning less than 50% of overall Telefónica's shares).

The situation didn't change till 1985, when the state began selling Telefónica's shares to privates and, finally, in 1996, under European Union's pressures to liberalize Spanish economy, Telefónica became fully privately owned with many subsequent POs (Public Offers). The state decided to keep a *golden share* in order to have a veto right in case of future large purchases by private investors.
Since then, Telefónica is not operating in a monopoly anymore and new players began to compete against Telefónica on the Spanish market: inevitably, Telefónica has been losing part of its market share which is not longer 100%. As stated by Whalley & Curwen, (2012) - page 229:

"(...) as a direct consequence of liberalization, the market share of incumbents has invariably fallen. (...) In the majority of the 45 countries in the sample where competition has been introduced, the incumbent's share of the market is now below 50% (...)".

2.1.2 The Telecom Italia Case

The Telco industry was born in Italy in 1877 with the first telephone connection within Milan area. Since then, different governments and authorities had opposite perspectives whether the telecommunication services had to be publicly or privately managed.

In 1881, the Telco industry was controlled by the Italian state with a monopoly: similarly to the case of Spain, it gave concessions to private companies, controlling the services they were offering. The Italian Government was also responsible to manage, improve and invest on the infrastructures among the cities - responsibilities for the private companies were limited to the services within the cities.

In 1907, the state decided to nationalize the service but, not even ten years later, the concessions were allowed again as the state received many complains because of an inadequate management of the services. Later on, during the fascism, other problems were tackled: the Italian infrastructures were provided by different companies (Ericsson, Siemens, Western, etc.) with problems of compatibility: the Government refused to switch to a single supplier in order to keep stimulating the competition and seek for more convenient prices. Therefore, in order to improve the service, Italy was divided into five

areas to be assigned to 5 different private companies. In addition to that, the state would have had the role of interconnecting the 5 areas.

The Italian Telco Industry didn't undergo many changes in the following years, mostly affected by the economical crisis of years '30s and by the World War II. After the reconstruction, in 1964, the 5 companies were re-organized under a single company: Sip (Società italiana per l'esercizio telefonico).

In 1987, Italy had to adapt to the new set of rules and regulations imposed by the European Union. The main issues were: infrastructures to be improved, match the new standards on quality and efficiency and, finally, re-organize the players in the industry in order to liberalize and allow the competition.
It was obvious that Sip's organizational asset had to be modified: in 1994, the group was renamed and enlarged with other 4 societies which were added to the previous 5 ones, giving birth to a new group: Telecom Italia S.p.A.
At this point of time, Telecom Italia S.p.A. was still owned by the government, but in 1997 things changed with a 3-step process: first, the government sold 6,8% shares to a set of *stable* enterprises composed by several Italian firms such as banks, insurance companies, financial enterprises, etc; second, similarly to the Telefónica's case, the government decided to keep a *golden share* for the same reasons explained for Telefónica; finally, the government sold the remaining 39,5% shares to private shareholders with a PO.

The Italian Telco industry became private and the roles of the authorities were limited to:

- Assure a fair competition between the incumbent and the new-comers by monitoring the prices and eliminating entry barriers.
- Guarantee the freedom of choices and of customization of services and of commercial offers.

Both cases present similar scenarios which brought the Telco industry, in each country, from the origins to the current state of the market, with a free open competition.
This current scenario will be described in the sections 2.2 and 6.1. In particular, the next section (2.2) will show the difference between the scenario described so far and the one which was formed after the deregulation process.

2.2 The Open Competition

Concerning the current scenario of the European Telco market, the first point addressed in this section concerns the advantages the incumbent operators had in each country in the past. Then, the focus will be on whether the incumbent operators are still benefiting from such advantages considering their current market shares and performances.

After analyzing many publications about the advantages which a first mover can benefit from (Bijwaard et al., 2004), the main ones can be grouped under different categories: switching costs, reputation on the market, technological leadership, and assets.

First of all, a first mover can benefit from being the first choice for the customers who, in the future, would incur in switching cost if deciding to change to a new entrant. Therefore, new entrants have to have a much better offer in order to convince customers to buy their products and to pay the switching costs to have it.
Examples of switching costs are: the initial investments necessary to adapt to a seller's product or service; the time and cost required to understand and get used to a seller's technology or software; the contractual costs which may be imposed by the firm and *tie* the customer to pay a fee for a certain period of time. A customer can avoid all these costs simply by not changing the operators and stay loyal to the first mover.
Second, a new entrant has to earn a certain reputation and image of reliability which a first mover may already have: this would require additional time and economic efforts, representing a disadvantage for the new entrant.
Third, there are technological advantages: some examples are related to the fact that the first mover is able to benefit from economies of scales and from a more *advanced* position on the learning curve which will allow to have better the cost efficiencies through learning by doing.
Economies of scale are (Oxford University Press, 2008):

"a proportionate saving in costs gained by an increased level of production"

Moreover, thanks to a higher experience in a particular industry, a first mover can benefit from patents, which will give temporary advantages and exclusivity on a particular technology or service. The fist mover can exploit the same longer experience to get feedbacks from the market and understand what to improve without any pressure from the competition.
Forth, in case of limited resources, such as particular materials hardly available in nature or strategic geographical positions, a first mover would be advantaged in getting access to them without any

competition: the first mover could then exploit such resources to target the best market segments in terms of profitability.
Finally, the market share depends on additional factors such as: price differences, advertising expenses and quality perceived by the customers.

From this overview it is evident that some advantages for the first movers exist. However, they are all not guaranteed: the first movers still need to be capable of exploiting them, thanks to right choices and investments.
Moreover, there are some environmental phenomena which may completely change the scenario: an example can be represented by the technological innovations of production systems or machinery. Existing company operating in the industry may be forced to upgrade their assets incurring in a investments which were not expected; new entrants, instead, would need to buy new assets anyway, so they could buy the most advanced ones.

The advantages described above still affect the market structure and the competitiveness between the incumbent operators and the other operators.
This has been proved by some studies on the market, such as the ones analyzed in the literature (Whalley & Curwen, 2012).
The authors mentioned (Whalley & Curwen, 2012) took as reference for the study 49 European countries and observed the market shares of the main operators within each of them in the last years, since the liberalization of the market till 2011. The result is that the market share of incumbents has fallen and, depending on the process of liberalization and on the level of competitiveness within each country, this decrease has been different.
However, studies have shown how, in the majority of countries, the incumbent operator is still the main largest player, leading the local market with a market share which is currently below 50%. There are just few cases in which the incumbent has been able to reverse the trend and regain market share on the new entrants.

3. The Telefónica Case Study – Part II: Company & Business Profile

This chapter is dedicated to the second part of the case study about Telefónica.
The aim of this part is describing how the company is working today: the first section will describe the societary structure, the geographical presence, the products and services offered.
The second section is dedicated to the description of a particular unit inside the whole group: this will be the one on which the whole research will be based on.
The third and last part is aimed at offering an understanding of the business in which the particular business unit is mainly involved.

3.1 Telefónica

In 2012, Telefónica realized a total of 62.356 million of euros as consolidated revenues, recording a negative growth compared to 2011, when the total revenues were of 62.837 million of euros (Telefónica, 2013). The volumes of revenues were still very high in 2012, however the negative growth may let think that something in the industry is changing and affecting the performances of the group. Both the company and the environment must be analyzed in order to have a clear picture of what is the reason of the negative growth.

Nowadays, one major strength of Telefónica is represented by its infrastructures: in 1926, Telefónica's web was born as an automated telephone centre in Madrid, which allowed connecting 3.800 km of telephone lines throughout Spain.
The network allows Telefónica to offer high quality service to its customers: without competitors, Telefónica was able to design and build its own network with no pressure from the market, building a competitive advantage against all the potential players. Thanks to such advantage, since 1971, Telefónica has been operating via the RETD (Red Especial de Transmisión de Datos), a public data network.
This network has been constantly expanding and growing, increasing Telefónica's coverage. Significant investments have been made in international expansion also via mergers and acquisitions: Telefónica has been targeting South America with different brands; in particular, the expansion towards this area started in 1990 in Chile and Argentina and then involved the whole South America bringing brilliant results to the group, which is still benefiting from these choices.

Nowadays, the company is present in 25 countries with around 314 million customers.

The following exhibit show the company's presence worldwide (Exhibit 3.1) and the network which allows satisfying the customers' demand of international Telco services.

Exhibit 3.1 – Telefónica Worldwide;
Source: Telefónica, 2012

The company has physical presence in the countries highlighted by the blue dots, while it has industrial and strategic alliances with the two countries highlighted by the yellow dots: Italy (with Telecom Italia) and China (with China Unicom).

The international network (shown in the Appendix - section B) allows Telefónica to reach a very large portion of the planet, being independent and selling traffic on such broad network to other Telco companies. This is another strength for Telefónica: its network is considered one of the largest Tier1 networks. A Tier1 network is large and broad by definition, since Tier1 networks are:

"those networks that don't pay any other network for transit yet still can reach all networks connected to the internet" (Van der Berg, 2008)

I.e. they are so broad that the traffic flowing on a Tier1 network can reach any other existing network. In other words, Telefónica can afford to use its own infrastructure to reach any other existing network. Without such a broad network, Telefónica would incur in additional costs to let its data flow on somebody else's networks.
Telefónica is really proud of offering its customers direct access to any destination with a very high quality and reliable service. As a consequence, the figures of the volume of data managed by Telefónica are also impressive - as of January 2013, the aggregate IP traffic reached the value of 1,83TB.

Telefónica differentiates itself with different branding according to the geographical location and the services offered.
Considering the geographical location, for example, Telefónica is known as: Vivo in Brazil, Movistar in Spain, O2 in UK, etc.
Tuenti is another brand of the group through which Telefónica sells services with cheapest available prices on the market and which are targeting young people.
Finally, on the B2B market the brand used by Telefónica is the corporate one: Telefónica; the main attributes associated to the brand are the quality, reliability and the broadness of the coverage, allowed by its network.
The different brands mentioned are shown in the Appendix (section B).

In order to operate and be successful in a complex business such as Telco one, Telefónica has a very challenging and ambitious mission, which has been recently stated by the CEO Alierta in the 2020 plan. Telefónica aims at being:

"(...) the best global communications company in the digital world (...)" (Alierta, 2010)

The vision, supporting such mission is (Business Principles Office, 2011):
"(...) improving people's lives around the world by transforming possibilities into reality - building a better future for everyone: our customers, employees, society, shareholders and partners:

- *Providing our employees with the optimal workplace, showing a firm commitment to talent, and guaranteeing the best opportunities for professional development.*
- *Placing the customer at the core of everything we do, aiming for their utmost satisfaction with our services and solutions.*
- *Offering our shareholders the best combination of growth and profitability in the sector.*
- *Acting as a driving force behind transformation. Forming an active part of the societies and markets in which we operate, offering our experience and perspectives as professionals in the telecommunications world. We show the global and local reality exactly as it is, coherently and with commitment, whilst being innovative, open, committed and honest in everything we do. (...)"*

Therefore, Telefónica's main values can be identified as:

- Vision: meaning that the company is well aware of the context it is operating in, and tries to anticipate the changes and lead the way.
- Talent: the company is focused on hiring the most talented people, attracting and keeping them experienced.

- Commitment: by doing everything responsibly and with integrity, Telefónica offers reliability to its customers and is able to build long lasting partnerships based on mutual trust, honesty and respect.
- Strength: thanks to a long experience as a leader in the industry, the company has a reliable knowledge of the industry on a global scale and is able to successfully add value to its offer and strengthen even more its position.

From a structural and organizational perspective, Telefónica's group is composed by many different companies which are fully owned by the group. Besides, Telefónica has a lot of other participations in companies involved in the business. The company has a very complex societary structure: the complete information about the structure is shown in the appendix (section B).

Concerning the corporate structure, in terms of organizational charts, the one representing Telefónica group is shown below (Exhibit 3.2):

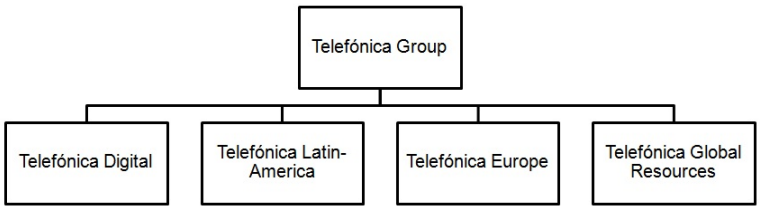


Exhibit 3.2 – Telefónica group organizational chart
Source: Telefónica, 2012

Telefónica manages operations in 25 countries thanks to three business units: Europe, Latin-America and the global business unit, which is Telefónica Digital. In parallel, the group has dedicated an additional business unit (Telefónica Global Resources) to the operative tasks.

In particular:

- Telefónica Europe is responsible for the operations in: Germany, Slovakia, Spain, Ireland, the UK and the Czech Republic.
- Telefónica Latin-America is responsible for the operations in: Argentina, Brazil, Chile, Colombia, Costa Rica, Ecuador, El Salvador, Guatemala, Mexico, Nicaragua, Panama, Peru, Uruguay and Venezuela.
- Telefónica Digital is taking care of analyzing the digital market worldwide, in order to seize and define new opportunities which will help Telefónica Group to grow: this is done through research & development, venture capital, global partnerships and digital services, such as: cloud computing, mobile advertising, M2M and eHealth.

- Telefónica Global Resources is responsible for the more operative tasks with the mission of optimizing the service and the profitability for the business. This is done by focusing on the main benefits arising from the operations worldwide.
  This business unit and the business units which respond to it will be described more in detail in the section 3.2, where the case study will continue.

Once the clear picture about the group has been presented, the focus will move to those areas, within Telefónica, which are closer to the market and the customers.

3.2 Telefónica Global Solutions

Telefónica Global Resources is the business unit which monitors the position of the company within the market and finds the right strategy to increase and improve its competitiveness.
Therefore, the tasks related to market analysis and customer relationship management are performed by Telefónica Global Solutions, which, within the structure shown below (Exhibit 3.3), is the closest business unit to the market.

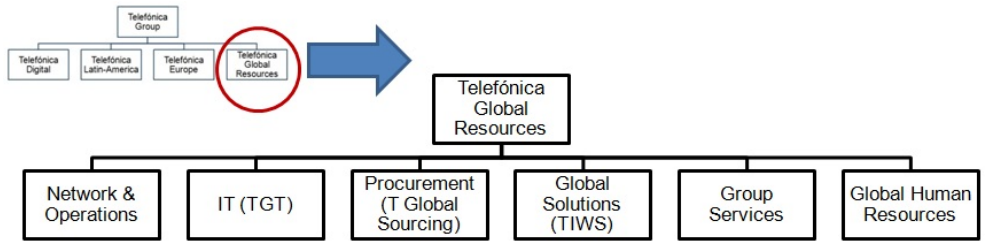


Exhibit 3.3 – Telefónica Global Resources organizational chart
Source: Telefónica, 2012

Telefónica Global Solutions is driven by a very challenging vision: becoming a global solution leader in the international wholesale market. Its main tasks are: meeting Telefónica's needs and providing efficient and high quality solutions. Therefore, the operative tasks within Telefónica Global Solutions can be of any kind; some examples are: developing new opportunities according to the market, managing the infrastructures, optimizing the voice and data traffic, developing new business and keep relationships with current and new customers.
The broadness of Telefónica Global Solutions' tasks can be seen by its organizational chart (Exhibit 3.4): there are many business units which have different responsibilities and need very almost any kind of competences and resources.

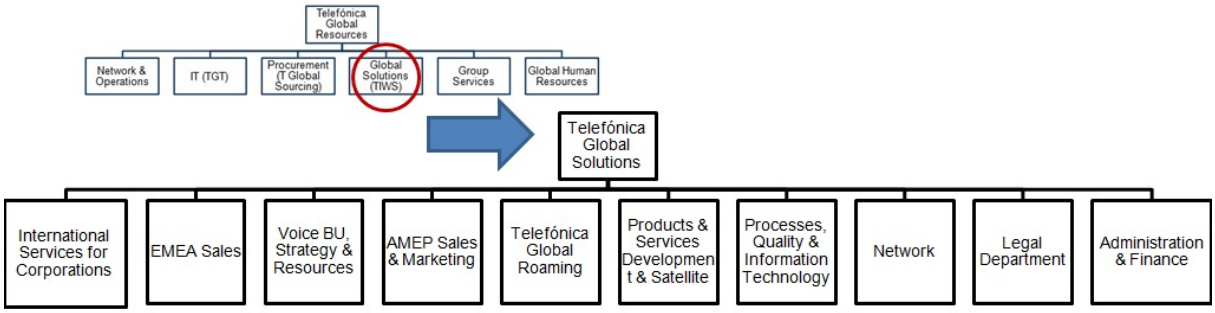


Exhibit 3.4 – Telefónica Global Solutions organizational chart
Source: Telefónica, 2012

The EMEA Sales business unit is the one in charge of manage the sales within Europe and Middle East Asia. Its daily operations include: following-up the different agreements with customers, define new agreements, revise final prices and finally manage the traffic exchanged with a particular customer.
The most practical way to describe the way Telefónica Global Solutions operates has been considered to be the Poter's Value Chain.
The theory and the way the model was conceived by its author will be presented in the literature review, where a section has been dedicated to the model (section 5.1.4). Therefore, if such information is not already clear, the reader is recommended to read the literature review first, before moving to the following paragraphs.

Before presenting the Porter Value Chain, having a clear picture of the Telco business is fundamental and a prerequisite to fully understand what is the model about.
In the next section, 3.3, the business will be described.

3.3 The Business

The dimensions of the Telco business are very broad: from the voice and data traffic exchange, to the IPTV services and the management of mobile-to-mobile communication. However, for the core activities within Telefónica Global Solutions consist in the voice and data traffic management.
Therefore, the main source of revenues for Telefónica Global Solutions is represented by selling, buying and re-selling voice and data traffic. In particular, an operator may need to buy some minutes or data flow on Telefónica's infrastructures if it wants to reach one of its final customers, in a specific location.
The transactions can be represented in the following way (Exhibit 3.5):

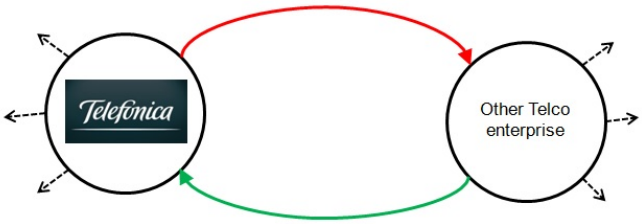


Exhibit 3.5 – The Telco Business
Source: Author's elaboration

Some minutes or data flowing on the red line (the one on top) will represent an expense for Telefónica, while some minutes or data flowing on the green line (the one at the bottom), will represent revenues for Telefónica.

Paradoxically, Telefónica is paying when giving traffic away and earning money when receiving traffic, on the B2B (business-to-business) market.

The way the model works can be explained with a simple example: let's assume that a Spanish businessman working in Madrid needs to call a customer, located in Sydney, with his Movistar Mobile number. In this case, the *Other Telco enterprise* was assumed to be Telstra - an Australian Telco enterprise - and, in order to allow the call, Telefónica, since it doesn't own any infrastructure in Australia, will have to use Telstra's infrastructure to reach Sydney, paying some euros per minute to Telstra. This cost will be charged to the customer - the Spanish businessman of the example - anyway, Telefónica will have an expense in order to send voice traffic from Madrid to Sydney because it is partially using Telstra's infrastructures.

Vice versa, any company which is interested in reaching Spain or Latin America but doesn't own any infrastructure can pay Telefónica in order to send some traffic on its infrastructures.

Among the voice services provided, Telefónica distinguish two categories: hubbing and mobile-to-mobile. The substantial difference among the two is the quality and therefore their price per minute.

In the mobile-to-mobile services, three properties are assured. First of all, the number of the caller is visible on the device which is called; second, a high service and quality on data-roaming is guaranteed; and, finally, an additional service is included: in case of any kind of problems which may affect the quality of a call, the traffic is automatically re-routed using another carrier's infrastructure so to look for the best quality and solve the problem. As a consequence, for any traffic route, Telefónica has in the database a back-up route which can be used in case of problems and in case of mobile-to-mobile service. In some cases, there is more than one back-up option.

On the other hand, in the case of hubbing services, the three properties are not assured: the best quality is always offered, if possible, but the automatic re-routing option isn't. As a consequence, in case of problems on the hubbing traffic, the call may be rejected, meaning that the customer has to look for an alternative route to restore the connection.

In order to simplify things, Telefónica periodically agrees and renews some strategic bi-lateral agreements and SWAPS (smaller and more informal agreements) with Telco companies: these forms of agreements are usually six-monthly and consist in a certain amount of minutes or data which will be exchanged between the two companies at a defined price, during the six months agreed. This part of the business is quite important, indeed agreeing, defining, modifying and making the follow-up on such agreements is part of the tasks of the sales function within Telefónica Global Solutions.

4. Research Methodology

This chapter contains the methodology used to complete the scientific research: the problems addressed and the scientific methodology used to analyze them will be described.
To best present the topic, the section has been divided into different parts.
First of all, the problem is described, showing its relevance for the company and for the reader and describing the goals targeted by the research. All this information will be merged into the research question which will be presented.
The following part is dedicated to present the paradigm used to address the problem.
Third, the possible reasoning approaches will be briefly described and a motivated choice for the approach used in this paper will be presented.
Then, the forth section will be dedicated to the presentation of the methodology of the research.
Fifth, the different types of sources which have been used to deal with the problem and to get all the information necessary to solve it will be described.
Finally, the information obtained will be merged in the last section, aimed at classifying the research according to the different dimensions described.

4.1 Problem Description and Research Question

This paper aims at analyzing a problem which telecommunications companies have been facing in the last years and which is still faced every year with more and more intensity.
The telecommunications market is undergoing a change in the demand due to different phenomena: first of all the fact that, nowadays, the customer needs can be satisfied by exploiting a network (the internet IP channels), which is different and cheaper than what customers have been buying since the birth of Telco services.
Second, the introduction of regulations which are controlling and lowering the price that Telco companies are generally charging for their services. These regulations are valid throughout Europe in order to establish common prices for the same services all over the nations.

As a consequence to the first phenomena, the demand is obviously slowly shifting from the voice traffic to the voice over IP traffic; similarly, the same trend can be seen for the SMS (short message service) which are nowadays replaced by applications which can send text messages over the internet, offered by a category of companies, called OTTs (Over-the-tops). The convenience for the customer is evident: once the internet traffic fee is paid, the customer can use it both for calling and sending text messages, avoiding additional costs for these two services over the PSTN (public switched telephone network). The result is of great impact on the way Telco companies are making business: MVNOs (Mobile Virtual Network Operator) don't seem to have a clear business model to manage the VoIP and, in any case, the exploitation of the internet is compromising the profitability of voice calls and SMS over the PSTN. Moreover, the network which customers have always been using since the birth of the telephone services - the PSTN - might end up unused, in the future, fully replaced by the IP (fiber, etc.). Nowadays, companies are still investing on these infrastructures: every year some improvements, upgrades or maintenance investments are required. The market scenario is forcing companies to invest on the network so that the modifications made on the PSTN will be fully-compatible with the IP connections in the long-run.
Concerning the second phenomena, instead, the Eurotariff is generally reducing the margin on some Telco services and increasing the competition, since companies don't have a full freedom over their pricing strategy. Besides, the introduction of the Eurotariff is putting MVNOs in a weaker position, compared to the OTTs.

The problems briefly described above can be translated in a research question, which has been proposed in the following way:

What are the consequences of the European Telco market shifts (caused by the introduction of the Eurotariff and the spreading of VoIP applications) over the European Telco companies? How can Telco companies react to such consequences?

The whole paper represents an attempt to answer the question, presenting the context of the research, the methodology, the theoretical background necessary to understand the topic and finally offering an analysis of the strategic environment which can prove the trend described and analyze their consequences with the possible strategic actions.
The main goal of the paper is to offer an understanding of the two phenomena which are affecting the Telco market: while the Eurotariff is a set of regulations which are immediate to understand, the VoIP phenomena requires some technical information in order to fully understand its pros and cons; therefore this second phenomena can result harder to be understood. For such reason, a technical introduction to the topic has also been included (section 6.1.4.5).

Finally, the implications of the two phenomena will be presented, in the form of a case study applied to one of the main player of the Telco market: Telefónica.

4.2 Research Paradigm

The research methodology adopted to write this thesis will be described in this section. From the scientific research literature (Collis & Hussey, 2003), it is possible to find two research paradigms.
From the one hand, a scientific research can be developed using a *positivist* paradigm. Positivism is (Oxford University Press, 2008):

"(…) a philosophical system recognizing only that which can be scientifically verified or which is capable of logical or mathematical proof (…)."

Such paradigm will generate highly reliable results but the research will require rigorous empirical testing, which means that it needs precise data. Besides, the reality is assumed to be objective and the author is assumed to be independent from such reality which is studied and analyzed in a detached way.
According to the literature (Harris, 2000 - page 756), such paradigm is particularly indicated for

"(…) the most observable and quantifiable issues and phenomena (…)"

However, the same author points out that in the international management research,

"(…) the most influential theories concern subjective qualitative phenomena (…)"

On the other hand, a totally opposed paradigm can be used as a basis for the scientific research: the *interpretative* paradigm. According to it, qualitative propositions can be generated by exploring data but the obtained findings cannot be used with great confidence. Differently from above, reality here is assumed to be subjective and the author plays an active role interacting with the object of research.
The chosen paradigm for this thesis is the *interpretative* one: the context in which the research has been conducted corresponds more to the typical features of the *interpretative* paradigm. Indeed, the author has actively taken part to the study, collecting the necessary data and information gradually and shaping the research according to the partial findings. The information obtained was both quantitative and qualitative – there hasn't been a majority of empirical sources or data and therefore, the study as well the paradigm cannot be considered positivist.

4.3 Research Approach: the Logic of the Research

Once defined the paradigm of the research, the approach to be used was identified. According to the literature (Collis & Hussey, 2003), there are three possible research approaches: on the one hand the

induction approach, on the other hand the deduction one and finally the two can be combined originating the abduction approach.
Induction is (Oxford University Press, 2008):

"(…) the inference of a general law from particular instances (…)"

Deduction is instead (Oxford University Press, 2008):

"(…) the inference of particular instances by reference to a general law or principle (…)"

The approach used in this paper is however a combination of the two ones, just defined: from the one hand some information has been obtained through empirical data – mostly used to identify the market and the demand trends as well as the market data showed in the research; on the other hand, the remaining part of information used, has been obtained through qualitative presentations about the Telco market, the company and the business and finally through the study of the theories analyzed in the literature.
Therefore, the abduction approach has been used in order to complete the research.

4.4 Research Methodology: the Process of the Research

The research methodology can be either quantitative or qualitative. A research conducted through a quantitative methodology relies on information based on numerical, precise data and empirical observation. On the other hand, a research conducted with a qualitative methodology is based on observations and information analysis which is performed in a subjective way: the information will consist mainly in data different from figures or numbers, therefore the total objectivity cannot be guaranteed.

Similarly to the chosen approach, the methodology used in the research has been influenced by the nature of the data, which were both numerical and not-numerical. As a consequence, the applied methodology has been a mix of quantitative and qualitative methodologies: at first the research offers an objective analysis – mainly related to the market and information about the demand, but it is thanks to the qualitative approach that the author has been able to draw conclusions about the consequences that the different market trends have on the demand and on the different players.
There hasn't been a clear prevalence of quantitative data over qualitative one or vice-versa, therefore the research can be considered completed through both the methodologies described.
Such methodology has allowed the research offering very reliable and specific findings - obtained through the study of the quantitative data and information – which, however, will have a narrow validity, due to the nature and the specificity of the data itself.

At the same time, the qualitative information has been analyzed and integrated in the research, in order to achieve higher validity, although the higher subjectivity may compromise the reliability of this second group of results.

4.5 Sources Overview

The scientific research has been based on multiple sources of information:

4.5.1 The Literature Review

First of all, the internet has been used as a source of theoretical material, e-books and articles about models of market analysis, technical knowledge about VoIP and Telco services. Such contents have been described and analyzed in the literature review and the majority of the information obtained was qualitative; in some cases, the application of some of the models described involved quantitative data; these examples have been used for the research.

4.5.2 Telefónica Internal Documents

Second, the research has been completed in Telefónica and the relative findings have been presented in the form of a case study about the company. As a consequence, all the data available through the corporate information systems was also exploited. Among the several platforms the company has, two were the most used: first of all, business intelligence software which allowed querying the entire database and in this way selecting relevant empirical data for the research.
Second, the research has been based on sources coming from eKISS, a platform which Telefónica uses in order to store researches, consultancy studies, presentations and committed analysis. Such files were not only about Telefónica but they were also containing general information about the market.
The content of the information obtained through such sources was basically empirical and numerical: such data has given the highest contribution in terms of quantitative information to the research; these data have been used in the different parts of the case study, mainly.

4.5.3 Telefónica Public Documents

Third, public documents and presentations available in Telefónica and on Telefónica corporative websites have been used. The information was both quantitative and qualitative and was the other relevant source of information used in the different parts of the case study.

4.6 Conclusion to the Methodology: a Classification According to Purpose, Process, Logic and Outcome of the Research

As a conclusion, the paradigm, approach and methodology defined, allow the research to be classified. This will be the topic of this section, as final consideration about the methodology adopted in the research.

According to the literature (Collis & Hussey, 2003), a scientific research can be classified according to four parameters: first of all the purpose of research, which is represented by the goals and objectives which are targeted by the research.

Second the process, which coincide with the methodology chosen for the research.

The third type of classification takes into account the logic of the research.

Fourth, the outcome, which is the general contribution given by the research to the literature.

Some of the dimensions have already been described in detail with a dedicated section. The remaining dimensions will be presented in this section.

- The purpose of a research can be exploratory, descriptive or predictive. Whenever a research is used to offer a general understanding of a topic and it is the first or one of the first attempts to bring findings about a relatively new topic, then it can be defined exploratory. Contrarily, a research is descriptive if it is based on a well-known phenomenon and it is just a contribution to present and analyze problems related to it.

  Finally, a predictive research is involved in the forecast of possible future results which are proved to be likely to happen.
- The process of research is determined either by the use of a qualitative or quantitative approach. They have been both described above, in the section dedicated to the methodology of research (section 4.4).
- The logic of the research can be deductive, inductive or abductive, as described in detail in section 4.3.
- Depending on the king of outcome, a research can be considered an applied research if it has been designed to solve a specific, existing problem. On the other hand, a research can be considered as a basic research if its result is to offer additional knowledge regarding a topic and not solve a particular problem related to it.

The present research, can be defined a *descriptive abductive basic research* conducted using both a qualitative and quantitative processes.

Due to the nature of the research, the process adopted can be considered both qualitative and quantitative: as explained above, both approaches have been used in different parts of the research,

therefore, the research as a whole cannot be considered either qualitative or quantitative, but its subparts can be classified more easily.

The logic of the research, already described is also a mix between the two extremes: deduction or induction.

Then, the purpose of research is descriptive: the Telco market phenomena described are well-known and the literature offers plenty of researches about VoIP mainly. This research is offering a contribution to the analysis of such phenomena with a managerial perspective, describing the possible consequences they can have on the Telco market players - Telefónica mainly.

Finally, in the last sections of the thesis (sections 6.2 and 6.3), possible strategic actions will be described, offering a possible way to turn the apparent problems into opportunities: these can be considered as ideas that Telefónica could take into account; however, according to the author's idea of research outcome, the thesis was meant to be considered a basic research, rather than an applied one.

5. Literature Review

In this chapter an overview of the researches, models and theories existing in the literature about the topics of the thesis will be presented.
Such models and theories, studied from the literature, have been used by the author as a guideline with the purpose of answering to the research question.
In order to better present the results found, the literature review has been divided into different parts, which correspond to the main topics related to the research question.
The first part is dedicated to the description of the tools used to analyze the strategic environment: the literature has been studied in order to select and describe the most relevant models and theories about the topic, according to the research purposes, defined in the research question (section 4.1).
The same has been done with the topic presented in the second part, showing the methodology used to investigate the consequences that the strategic environment analysis can bring to the strategy.
Third, the methodology used to deduce the strategic guidelines will be described: this consists in a model which is able to suggest strategic actions linked to the findings coming from the second part.
Finally, the last part is a conclusion about the literature review: a summary of the models analyzed will be presented and the comment of the author will be included in order to show which models have been used in the paper.

5.1 The Analysis of the Strategic Environment

According to the findings described in the literature (Lynch, 2006), the analysis of the strategic environment is just a part of a broader process, aimed at defining the corporate strategy of a company.
Such process may vary depending on whether the objectives and the main elements of the strategy have been defined in advance, in a dedicated planning phase. Indeed, there can be the case that a strategy is implemented without a clear final objective but its actions are implemented due to a need or a reaction.
The process can be seen in the following exhibit (Exhibit 5.1):

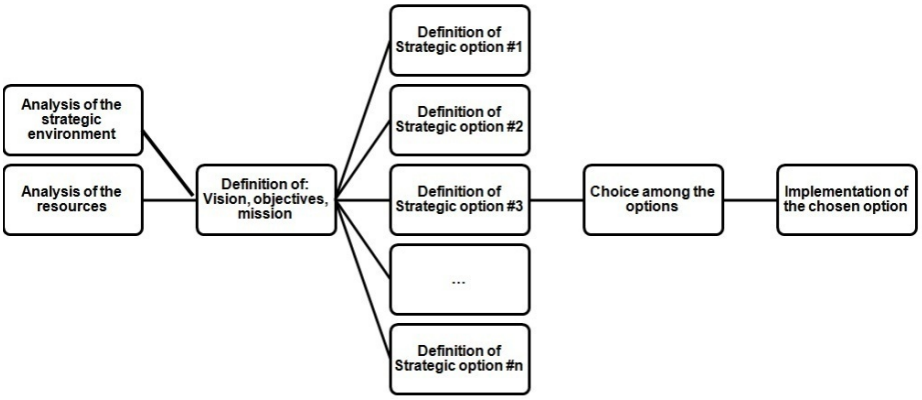


Exhibit 5.1 – Strategy Formulation Process
Source: Lynch, 2006, page 75

It is possible to see that the analysis of the strategic environment is one of the initial phases. Within such phase, nine steps were identified (Lynch, 2006): they have been taken as a guideline and presented in the following exhibit (Exhibit 5.2).

The nine basic stages guarantee the completeness of the analysis and can be performed with the help of related models and tools.

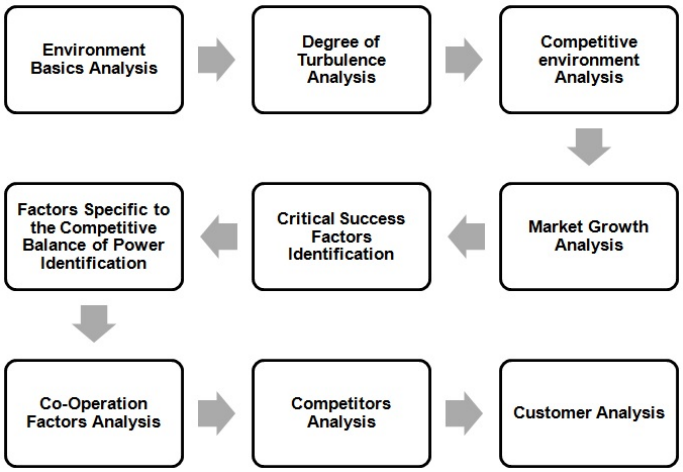


Exhibit 5.2 – Analysis of the Strategic Environment Process
Source: Lynch, 2006, page 80

A brief overview on each stage will be given in this section.

First of all, the environment basics analysis consists in a general investigation about the market in order to find out its size, growth rate and the current players. The size of the market can be generally described in terms of annual sales; the growth rate is a comparison with the previous years; finally, the market players are shown in terms of market shares.

Second, within the environment the business operates in, a particular focus must be dedicated to the assessment of the degree of turbulence. Thanks to such analysis it will then be possible to estimate how predictable the environment is and therefore which kind of strategies is possible to implement.
The analysis is performed taking two measures into account: the changeability and the predictability. The first one is defined as the degree to which the environment is likely to change. The second one is defined as the degree with which such changes can be predicted.

Third, the competitive environment is analyzed: this is generally done throughout a PEST or PESTEL analysis, as explained in the section 5.1.1.

Forth, the analysis of the market growth consists in an evaluation of which is the current stage in the industry life-cycle. As shown in the literature (Lynch, 2006), the contribution of Michael Porter is very important in this step: thanks to his studies, an industry undergoes four basic stages which compose the general model of industry lifecycle. According to the phase an industry has reached, a coherent ideal strategy can be defined.

Fifth, the critical success factors for the industry can be defined as the resources or skills which are typical for a particular industry and crucial to be successful in that industry.
Although a lot of variables might influence the performances of a company in an industry, the purpose of such analysis is to identify few elements which are the most important and distinctive ones. The enterprise could then focus on such elements in order to increase its competitive advantages.

Sixth, part of the analysis is dedicated to the understanding of the factors which are specific to the competitive balance of power in the industry. Once identified the forces within the industry which influence the organization, a company can focus on the possible competitive advantages which may have. To guide the analysis and find out about such forces, the Porter's five forces model is generally very helpful in the analysis.

Seventh, among the companies it is possible to establish different kind of relationships: this part of analysis is aimed at understanding which are the factors that determine the most convenient type of relationship, within a particular industry.
Eighth, part of the analysis is dedicated to draw a picture of the main competitors. This can be called *competitor profiling* and consist of an evaluation of the resources, performances and products of the main direct competitors. With a more complete picture of the competitors, it is also possible to better face them.

Ninth, a customer analysis is needed in order to understand what exactly matter for the potential customers. The customers must be successfully identified, divided into convenient segment and finally clearly targeted. Since the customers are the stakeholders who deliver the revenues, the study of their needs and features must be considered within the formulation of a corporate strategy. This is very close to a marketing study and, at the same time, is very important for the definition of the strategy.

The process just described has been taken as a reference and adapted to the research purposes. As will be described in the research part, the process which has been actually used consist of a revised version of the process just described, which excludes some phases and therefore, only some of the models presented in the literature (Lynch, 2006), have been actually applied.
The following sections are dedicated to the explanation of the models and tools which will be used in the research. Two sub-sections will be dedicated to each model or tool: first, the history and evolution of each model will be briefly described; second, the use and application of such model will be further studied.

5.1.1 PEST Analysis

The PEST (Political, Economic, Socio-cultural, and Technological Future) analysis is a tool which was designed to understand the external macro environment in which a generic enterprise operates.
The macro-environment can be defined as a particular context in which a business operates, identified by particular set of political, economic, social, technological and legal aspects.
Each letter of the PEST acronym stands for a factor, which was believed to affect the environment.
The model can be used as an instrument to guide the researcher in the analysis of an environment, basing the study on the description of each relevant factor.
In the first part of this section, an overview of the history and development of the model will be presented; in the second part, the model and its application will be described.

5.1.1.1 Origin & Evolution

The PEST analysis is strongly present in the literature under many different definitions, such as PEST, STEPE: there is not an unique author or a well defined history for the PEST model. This term has been used for a long time to address to a model which showed the relevant factors that must be analyzed in order to complete an external macro environment study. The name itself is an acronym of the different factors which the model suggests to take into account.
The lack of a clear history for this model is due to the fact that such concept was developed before the PEST model as it is known nowadays: it has been used to create other models, called in a different way

and with different acronyms, indicating that different authors gave importance to other factors, different from the ones included in the PEST. However, it is difficult to assess when and by whom such concept was used for the first time.

According to the literature, (Yüksel, 2012), the first model to guide researchers in the analysis of the environment was created by Francis J. Aguilar, in 1967, and named ETPS model. Officially, thanks to his model, "scanning the business environment" was possible. According to Aguilar, the relevant factors were *Economics*, *Technology*, *Politics* and *Social* environment. Since 1967, different authors have built on the original Aguilar's model, adding and removing some factors and changing the name accordingly.
For example, A. Brown, reorganized Aguilar's model in the STEP model which was including *Strategic*, *Trend*, *Evaluation*, and *Process* as relevant factors to organize the results coming from an environment study.
In the '80s, PEST, PESTLE, STEEPLE and other models were born thanks to the contribution and the studies of different authors, including M. Porter and Richardson (2009), who added the legal dimension.
As mentioned, all the models were developed using the same logic; besides, they also took and studied the factors giving them the same importance or priority.

Nowadays, the most used models are the PEST and the PESTLE ones: the second is just like the first one, with the addition of two factors: the Environmental future and the Legal future. The model presented in detail in the next section will be the most generic one, called PEST.

5.1.1.2 The PEST Factors

The goal of the PEST analysis, according to (Yüksel, 2012), is twofold: first, to identify the environment in which a company operates; second, to collect data and useful information which may help a company to predict future situations, problems and opportunities.

The PEST analysis offers a checklist of factors which have been judged relevant in order to understand the environment in which a company or a business operates.
Such factors, according to the PEST model, are: Political future, Economic future, Socio-cultural future and Technological future.
The PESTEL model takes the same factors into account, adding two dimensions (Environmental future and the Legal future).

The first remark which is possible to make is that every factor is analyzed according to a *future* perspective, meaning that the analysis is still based on present and past phenomena which still affect and have affected the environment and the business, but they are all analyzed in order to be used as a forecast of future opportunities and events.

PEST analysis has still a role in corporate strategy (Lynch, 2006), although it can be argued that the future is so uncertain that a prediction based on past events may be useless. The literature (Lynch, 2006 - page 85) points out how PEST is in any case useful for different roles, such as offering:

"(...) an analysis which interprets past events and their interrelationships (...)".

A second possible remark is that the additional factors offered by the PESTEL analysis can be seen under the same umbrella of factors already existing in the PEST analysis.

Indeed, the Environmental factor can be related to any of the other PEST factors depending on what dimension is affected by such environmental factor.

Similarly, the Legal dimension can be also seen as a sub-section of the already existing Political dimension – since laws and regulations are generally approved by political institutions and authorities.

Before showing the model itself, it is possible to notice how PEST is a very flexible tool which can be easily adapted to any circumstance: if a particular industry or environment has an unusual dimension or presents the necessity to separate the legal factor from the political one, this can be easily done, adding a dimension to the PEST model.

Each factor can be further defined and described in order to guide the researcher in the analysis of a business environment. This will be done as well in the research, following the Exhibit 5.3:

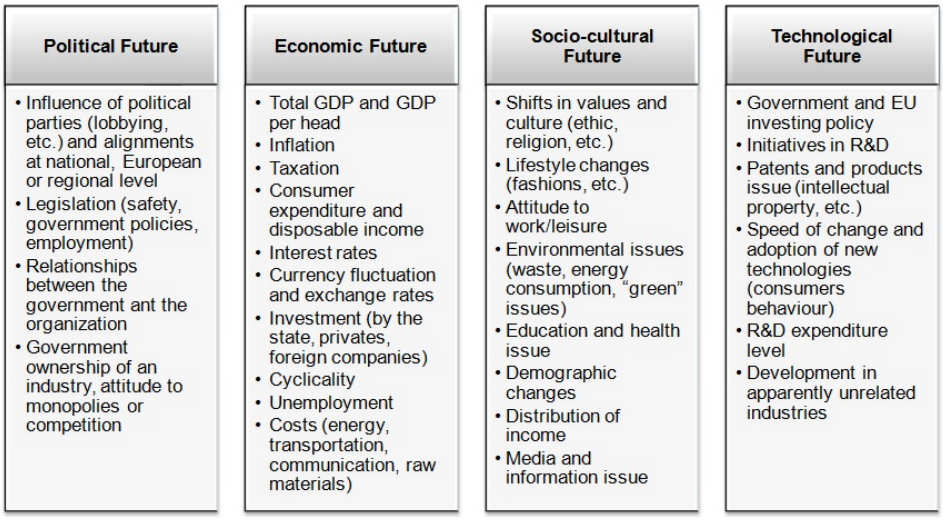


Exhibit 5.3 – PEST Model: the definition of the factors
Source: Adapted from Lynch, 2006, page 84

In order to have an efficient analysis, the literature (Fernández-Balbuena, 2008) offers some suggestions. The author, for example, points out the importance of including in the PEST analysis just the factors which are relevant for the enterprise and the business: as instance, although the demographic evolution or the birth rates are elements of the external environment, these may not be relevant for the business and therefore shouldn't be included in the analysis.

According to Yüksel (2012), PEST analysis has three sets of limitations: first of all, it is a subjective analysis in which there are no quantitative approaches. The risk is that the factors which constitute the environment might not be objectively studied. Second, the factors which are analyzed might have different weights and relevance for the industry or for the company: this feature is lost in the PEST analysis as it doesn't provide any tool to *weight* or simply take the importance of a factor or a sub-factor into account. Third and finally, the PEST analysis has always used an independent approach when analyzing the different factors: this would give a wrong representation of the environment, which may require an inter-dependence based approach.
A revised model of PEST analysis was presented (Yüksel, 2012), in order to partially solve such weaknesses: according to the studies, three additional methods (the DEMATEL, AHP and ANP) were applied to the classic PEST analysis. With the complex methodology the environment could be modeled in an:

"(…) analytical and systematic manner (…)".(Yüksel, 2012 - page 65)

However, without complicating the model so much, there are many cases in the literature which still show how useful the use of the PEST model – in its *original* form – can be. Two very different examples may be represented by the recent researches of (Lv & Wu, 2009) and of (Mayaka & Prasad, 2012).
The first research consists of an application of the PESTEL analysis to find out the environmental factors which may affect an improvement solution for the China's northern region's energy efficiency.
The second research is an investigation about the external factors affecting the tourism in Kenya.
The general message of these examples is that, although PEST/PESTEL analysis is not an analytic and precise tool, it can help researchers in offering a guideline for the market analysis and research. Once the general factors which are affecting the market are found, then they can be further analyzed with more precise models.

5.1.2 Critical Success Factors Identification

This section is dedicated to the understanding of the analysis of an industry in order to find out what its critical success factors or key factors for success are. The analysis consists in a process which leads to the identification of the CSF: there are not particular models or tool to complete such process - the key point is understanding what exactly the CSFs are and how they can be useful.

Critical Success Factors are those resources, competences, attributes which are essential for an organization to be successful in the specific industry in which it operates (Lynch, 2006).
The concept of CSF have been introduced in 1983 by Kenichi Ohmae (Lynch, 2006), a strategy consultant who worked for McKinsey in Japan.

According to K. Ohmae, the success of an enterprise operating in an industry is determined by a great amount of factors: due to limited resources and time available, it is impossible to take each of these factors into account, giving all of them the same level of attention and level of detail in the analysis.
CSF is a term designed to address to that limited group of factors which consist in the resources, competences, attributes that are essential for an organization to be successful in the specific industry the organization operates in.
Therefore, it will be possible to focus the limited amount of time and resources on such CSFs, as it is more likely that they directly affect the success of the enterprise in the industry.
CSFs depend on the industry and they are generally the same for all the enterprise in the same industry: the key point when dealing with CSFs is their identification: in order to focus our resources on some factors, it is necessary that those factors are really the critical ones.
There are not general models which lead an organization to the identification of such CSFs, however, the starting point which should be considered, when looking for the CSFs of an industry, consists in the types of resources which the organizations have and the way they are implemented in the field.
In particular, K. Ohmae identified three *C* which are three dimensions an enterprise should consider and study in order to find the CSFs.
The first dimension highlighted is the one represented by the customers: some critical factors could be related to what customers are really looking for on the market and how can they be targeted.
Second, the competition needs to be considered in order for the organization to focus on those factors which could lead to a competitive advantage: such factors can be related to quality, price, reliability, distribution network, etc.
Third and last, the corporation needs to analyze itself in order to understand whether some critical factors require particular resources, skills, abilities which need to be developed or which are already available to be exploited to obtain a competitive advantage.

The concept of CSF was criticized (Lynch, 2006): first of all, the identification of the right CSF is both very important but also very difficult. Since no models which can help to successfully identify the CSFs of an industry exist, the process of identification risks being too subjective.
Second, even if the right CSFs have been identified, another fundamental step would be understanding how they affect the industry: this cannot be taken for granted but, again, there are no models or tools which could help understanding the topic.
Third, the identification of the CSFs itself can be performed by any company in the industry: it cannot be considered as a distinctive feature of an enterprise and, therefore, it does not represent a competitive advantage.
Forth and last, focusing on the CSFs only can be *dangerous*, especially in those fast-changing industries where success is driven by radical changes. There can be new CSFs or new opportunities to generate competitive advantages - focusing just on the existing resources can prevent a proper identification of such innovative aspects of the industry, giving just a limited vision of it.

5.1.3 Porter's Five Forces

5.1.3.1 Origin & Evolution

The literature analyzed (Grundy, 2006) claims that Porter 5 Forces has gained more popularity in the academic environment than in the practical one: the model didn't gain high awareness among the managers and this is the reason why Porter's Five Forces' major application is mostly found in researches and academic papers rather than in the analysis and reports made by companies.
The author (Grundy, 2006) compared the level of awareness of the SWOT analysis with the one of the Porter 5 Forces. SWOT is said to have reached the 90-95% of awareness among managers, while Porter's 5 forces model has reached a 15-20% of awareness only.

Porter's Five Forces model was born in an economics environment and the author is Professor Michael Porter from the Harvard University Business School who published the model in 1979 in an article named: "How Competitive forces shape strategy" (Porter, 1979).

5.1.3.2 The Model

The model comes from an investigation of the forces which influence the competitive environment: as remarked by Fernández-Balbuena (2008), the object of analysis is the full industry and not a particular company operating in the market.

By understanding such forces, then it is possible to have a clear image of the critical dimensions within the industry, on which the company should focus (Lynch, 2006).
According to Michael Porter, five are the forces which mainly affect the environment.

The first force identified is represented by the barriers to entrance, which, according to Porter, consist in everything which represent an obstacle to potential competitors to enter an industry. A possible link between the barriers to entrance and the expected profitability of the industry may exist (Fernández-Balbuena, 2008) – with high barriers to entrance, then, a high profitability is expected in that particular industry. There are different factors which determine the presence of barriers to entrance. Porter identified 7 of them (Porter, 1979):

- The economies of scale: they can lead to cost advantages through an acquisition of higher experience and therefore a better productivity or efficiency. If that is the case, then these can be considered a barrier to entrance.
- The product differentiation: an industry requiring a highly differentiated product line also requires a bigger initial investment, which represents a financial barrier for the new players.
- The initial investments are a barrier to entrance and consist in the expenses which companies need to first dedicate to the installation of equipment and assets and to the initial advertisement campaigns. Such investments may be paid back once the company makes profits but there is also the risk of losing the money, if the company is not successful.
- The switching costs are the cost which a company has to face in case of a change in the suppliers or in the equipment: they can be a barrier if they are particularly high, as they contribute to increase the risk related to entering an industry.
- The access to the distribution channel may be a barrier to entrance in case it is complicated by: competition, trust, competences required.
- The cost advantages not dependent from the size are another barrier identified by Porter: there are additional possible costs advantages which don't depend on the size of the company or on the use of economies of scale; these consist in particular technologies, access to the best suppliers, government subsidies, etc.
- Finally, the political and governmental policies can represent a barrier to entrance whenever, for example, governmental agreements influence the accessibility to the industry.

The second force identified is the rivalry in the industry. According to Porter Michael E., 1979, high competition means possibilities of revenues are low and vice-versa. Fernández-Balbuena, (2008), lists the factors which determine a high competition. These are: a high number of competitors; a low demand growth rate; high fixed costs, which would force the players to raise the final prices of the products sold in order to recover some of the variable costs; low differentiation, which would simply

imply that there are less ways to compete and gain advantages; excessive production capacity; diverse competitors (foreign players, etc.) with strategies which are not so clear and defined; high strategic interests: if the industry considered represents a core element in the competitors' strategy, then the competition will be very high; seasonality and irregular demand, which forces companies to keep stocks; intense barriers to exit: due to high barriers, it is possible to assume that expectations of the risk in the industry are high, although this should be confirmed by a more precise and complete risk analysis.
The presence of barriers to exit is affected by the following factors: high specificity of the assets which cannot be re-used in a different industry; fixed exit costs, such as cancellation of contracts and agreements; strategic synergies: a company may *need* a presence in a particular industry due, for example, to brand-image strategies; social, political, union - related restrictions; emotional barriers: refuse to abandon an industry or a product due to emotional reasons.

Third, the presence of substitute products is another force which determine to what extent an industry is attractive. Substitute products are those products which are manufactured in different industries but which target the same customer segments and the same customers' needs.

Forth, the bargaining power between the company and the suppliers is shifted towards the supplier if the following are typical feature of the analyzed industry: the concentration in the suppliers' industry is higher than in the one in the considered industry; no substitute products exist; suppliers are present also on other markets which may be more profitable for them; high switching costs; suppliers are important stakeholders and the products supplied are core parts of the final product.

Fifth, the bargaining power between the company and the customers (or, as defined by Porter, buyers) is shifted towards the customers if the following are typical feature of the analyzed industry: the concentration in the industry is high (meaning that the power is in the hand of a handful of large players); there are substitute products; low switching costs for the customers; what is bought by the customers represent a high percentage of their costs; what is bought by the customers is not relevant in terms of final quality; broad accessible information: especially if they are aware about all the information regarding the margin and cost structure in the industry.

In the following exhibit (Exhibit 5.4), the Porter's Five Forces model is represented: there is not a different degree of importance assigned to the forces as they're all put on the same level in the analysis.

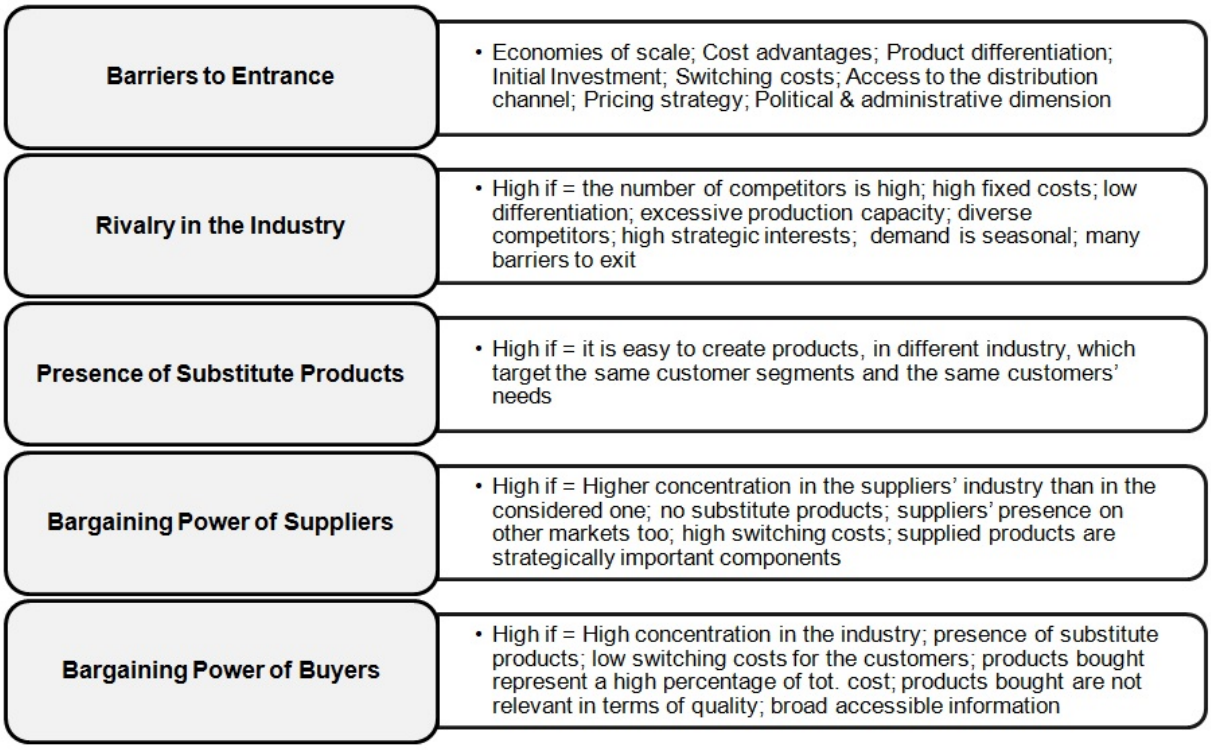


Exhibit 5.4 – Porter's 5 Forces Model
Source: Fernández-Balbuena, 2008, page 33

The literature (Grundy, 2006) presents a study on the pros and cons of the model and underlines how it is very much linked and interdependent with other tools such as PEST or SWOT analysis.

In this paragraph, the cons which were identified (Grundy, 2006) will be presented.

- First of all, the author argued that Porter's Five forces oversimplify the value chain: buyers and suppliers are two general terms which should be further defined in some cases.
- It offers no-relation with other models: although there is a link, it hasn't been taken into account in the definition of the model.
- Besides, it is not linked to possible management actions: there is a lack of possible suggestions or guidelines for the management in order to influence the different forces, they seem just described but not linked with possible improvement actions.
- The model also over-stresses the macro-analysis over the micro-analysis.
- Finally, it assumes the boundaries of an industry to be clearly established and quite fixed: the truth is much more dynamic and less defined.

Lynch, (2006), also gives a contribution in this sense, showing additional critics to the model. The main ones are that the model is mainly static, giving an overview on the 5 forces at the as-is state of art. There is no future perspective which would be needed in the current fast-evolving scenario. Moreover, Porter's Five forces model considers buyers and suppliers as potential threats: the

possibility of a co-operation with such stakeholders is not taken into account and it seems that buyers and suppliers are assumed to have an hostile approach in the industry.

There are also some unique or positive aspects of such model (Grundy, 2006).

- First of all, it is pointed out how the model is simplifying the micro-economic theory which is reduced just to 5 elements (the 5 forces).
- Besides, it helps the prediction of long-run rate of returns, it combines the input-output analysis of an industry with its boundaries (barriers and substitutes), it gives importance to look for imperfect markets, and to the bargaining powers of the stakeholders involved in the business.
- It also helps the analysis of a market as it gives much more information than a simple research on the relative market growth rates.

5.1.4 Porter's Value Chain

Porter's value chain will be presented due to its effectiveness in analyzing the internal environment, describing the way companies or business units work and due to its contribution to the SWOT analysis. Indeed, according to the sources used (Fernández-Balbuena, 2008), the strengths and weaknesses in a SWOT matrix can be obtained by understanding Porter's value chain.

5.1.4.1 Origin & Evolution

The model was officially created by Michael Porter from Harvard Business School in 1980s, however the logic behind the model has different roots.
In particular, the concept was introduced for the first time in the areas of accounting, some years before Michael Porter's value chain (Lynch, 2006). Professor Porter, then, had the idea to build a model which could be generically applied to any company operating in any field or industry.

5.1.4.2 The Model

The model is a representation of the activities and business processes of the general enterprises operating in an industry which, combined together, successfully contribute to create value. The focus in the model is still general, and the purpose is identifying the group of activities in which the value is mainly created.
According to the model (Lynch, 2006), the activities of a company are separated in two groups: primary activities and support ones. The primary activities are the ones which are typical and fundamental for the core business of the company to run. An example can be the production in a

manufacturing enterprise. With outstanding performances in one of these activities, the company could benefit from a competitive advantage against the competitors and therefore the activity itself adds value.

The support activities, instead, are the ones which allow the primary ones to run properly, guaranteeing the proper background. These are neither unique nor part of the core business process of a particular enterprise.

Porter includes a more precise description of such activities (Lynch, 2006).

- Among the primary activities, first of all, the inbound logistics is described as the group of activities related with the supply management. In particular: receiving the goods from the suppliers, storing them and handling the transportation.
- Second, the operations are the activities related with the transformation of raw materials into final products or the production of services, which are sold to the customers.
- Third, the outbound logistics is related with the distribution to the final customer: in detail, it includes the management of warehouses, transportation and the definition of what is presented to the market (definition of the catalogue of products, bundling, etc.).
- Forth, the marketing and sales are the activities focused on studying the market in order to find out if the customers' needs and desires are met by the products offered by the company. A proper marketing strategy must also be defined in order to make the customers aware of brands and products.
- Finally, pre and after sales services represent the last of the primary activities according to Porter. Such services are, for example, the installation of a product or the maintenance.

The same could be done for the support activities; the following support activities were identified by Porter:

- First of all, the procurement consists in the activities of purchasing the best equipment and material in terms of price versus quality ratio.
- Second, the technology development is in charge of managing the information systems, training the personnel, etc. in order to allow the other functions to successfully operate with the technology they require.
- Third, human resource management consists in the activities of recruiting, supporting and managing the personnel concerning any issue: rewards, holidays, security, etc.
- Finally, the firm infrastructure consists in the planning and control activities which are possible to find in any enterprise (examples are: finance, accounting, strategy development, etc.)

The support activities just described also contribute to the creation of the value for the whole enterprise but in an *indirect* way, as it is not clearly linked with the core business of the enterprise.

The primary and support activities described are generally presented in the following way (Exhibit 5.5):

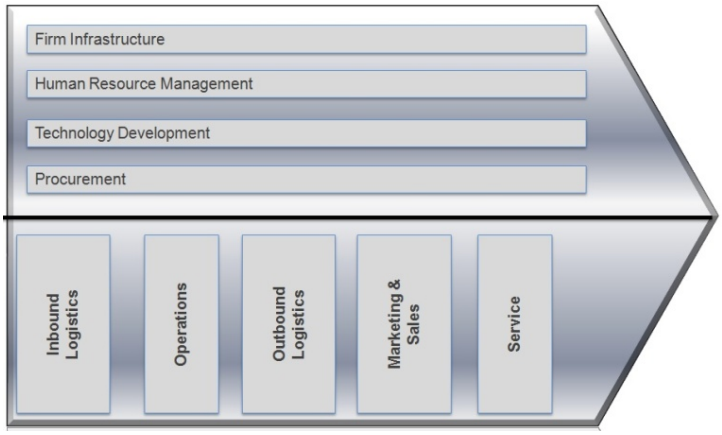


Exhibit 5.5 – Porter's Value Chain Model
Source: Fernández-Balbuena, 2008, page 56

The literature highlights some limitations of the model.

First of all (Bartezzaghi, 2010), the boundaries of Porter's Value Chain are not clearly defined: since business processes complexity is increasing due to more specific customers' needs and technological improvements, the representation of activities nowadays involves more aspects, such as external actors and stakeholders, who companies outsource some activities to or who co-operate with the companies. According to Porter's definition of value chain, these activities should be included in the model; however, the model should represent just the activities performed by the enterprise which is the object of analysis. Therefore, there are controversial opinions about how to apply the model on these cases.

Second, the literature (Lynch, 2006) highlights the fact that the model is conceived to represent the as-is situation of an enterprise or business. Strategies require always more and more continuous updates and the as-is perspective only is not enough to remain competitive on the market. Porter's value chain doesn't include such features in the analysis.

Apart from this, Porter's Value Chain is defined (Fernández-Balbuena, 2008) as very effective in order to show where the enterprises should focus the attention, highlighting the main activities which generates and add value. This is the goal which is pursued with the application of Value Chain analysis in this research. Indeed, its main role is basically helping in the identification of strengths and weaknesses within particular divisions of the enterprise.

5.2 The Analysis of the Consequences on the Strategy

Once the strategic environment has been analyzed, in order to follow the process presented at the beginning of section 5.1, the focus should move towards the company in order to understand how the findings emerging from the study of the strategic environment affect the strategy. The literature has been studied in order to find models and theories which could be used for the described purposes: for this section, every choice or finding obtained come from the SWOT analysis, which will be described in the following paragraphs.

The SWOT analysis is a tool of support to a broader process (Fernández-Balbuena, 2008), aimed at defining the internal strategy of each business unit of the company. Such process is the one found by K. Andrews from the Harvard Business School:

1. Analyze the situation in order to determine *where* the organization is.
2. Study the different possibilities of actions which exist to determine *what* the organization can do.
3. Define the objectives to reach in order to determine *where* the organization is willing to be in the future.
4. Choose one of the options, to determine *how* the organization will reach the objectives.

The SWOT analysis is useful to complete the first two step of this process, understanding the actual context within the company and the options of action.

For the remaining steps, another methodology will be used: it will be presented after the SWOT analysis.

5.2.1 SWOT Analysis

5.2.1.1 Origin & Evolution

SWOT (Strenghts, Weaknesses, Opportunities, Threats) is (Lynch, 2006):

"(…) an analysis of the Strengths and Weaknesses present internally in the organization, coupled with the Opportunities and Threats that the organization faces externally. (…)".

According to main literature source, used in the research, (Lynch, 2006), the SWOT analysis is considered a contribution of Professor Kenneth Andrews from Harvard Business School in the 1960s.

However, according to other researchers, the SWOT analysis has different origins, which are defined *obscure* (Kuhn, 2004), since conflicting information available in the literature (Kuhn, 2004): Haberberg attributes the creation of SWOT analysis to Professor Kenneth Andrews, while Turner believes Igor Anoff (1987) to be the author of SWOT matrix.

Although there's not an official version about when and by whom the SWOT model was created, the literature is full of both applications and a lot of misconceptions (Koch, 2000; Fernández-Balbuena, 2008).
The two authors point out how the SWOT analysis is a tool which can be useful to identify strengths, weaknesses, opportunities and threats within a business unit of the enterprise. However, SWOT is often mistakenly applied to a market, rather than a firm: the model represents a guideline to stimulate reasoning about the units of the firm. By combining such findings with a proper analysis of the macro environment, then a strategy can be formulated for a particular unit of the enterprise.

To sum up, this model is not designed to analyze or conduct a research about the external environment in which an enterprise operates. Its purpose is to make an internal analysis of the firm. The complicating factor is that the two topics, as underlined by Fernández-Balbuena, (2008), are very much related: the SWOT analysis can be seen as a step forward to link the findings about the external environment studies with the internal ones, in which each business unit operates.
The model and the way a SWOT analysis can be performed will be described just below.

5.2.1.2 The Model

The SWOT represents a way to conduct a specific analysis for each single activity inside the enterprise. Before implementing a SWOT analysis, some prerequisites are needed, as explained below.
First of all, the SWOT analysis requires some pre-studies about the industry both externally and internally. Part of the models described in this literature review is helpful in order to accomplish such analysis.
On the one hand, an analysis of the industry with an external perspective is equivalent to analyze the macro and micro-environment. As previously mentioned (from section 5.1.1), the macro-environment analysis consists in studying about the political, economic, social, technological and legal aspects of the strategic environment. This analysis could be performed using the PEST model. On the other hand, the study of the micro-environment is an investigation about the aspects which are closer to the enterprise and the business, such as: customers, competitors, substitute products and demand changes and evolutions. This could be performed using the Porter's 5 Forces model.
Finally, in order to have a clear picture of the way the actors in the industry work, an internal analysis should be performed, using Porter's Value Chain model.

Once the requisites are satisfied, the next step is represented by the SWOT analysis, which completes the information contained in the models used: literature (Fernández-Balbuena, 2008), (Lynch, 2006) clearly show how SWOT is coming from PEST, Porter's 5 forces, industry lifecycle studies, which are helpful in order to determine the Opportunities and Weaknesses. Meanwhile, Porter's value chain will help in identifying which are the internal Strengths and Weaknesses.

The general SWOT matrix is shown (Exhibit 5.6): the different factors of analysis for each of the four dimensions are taken from the literature (Lynch, 2006).

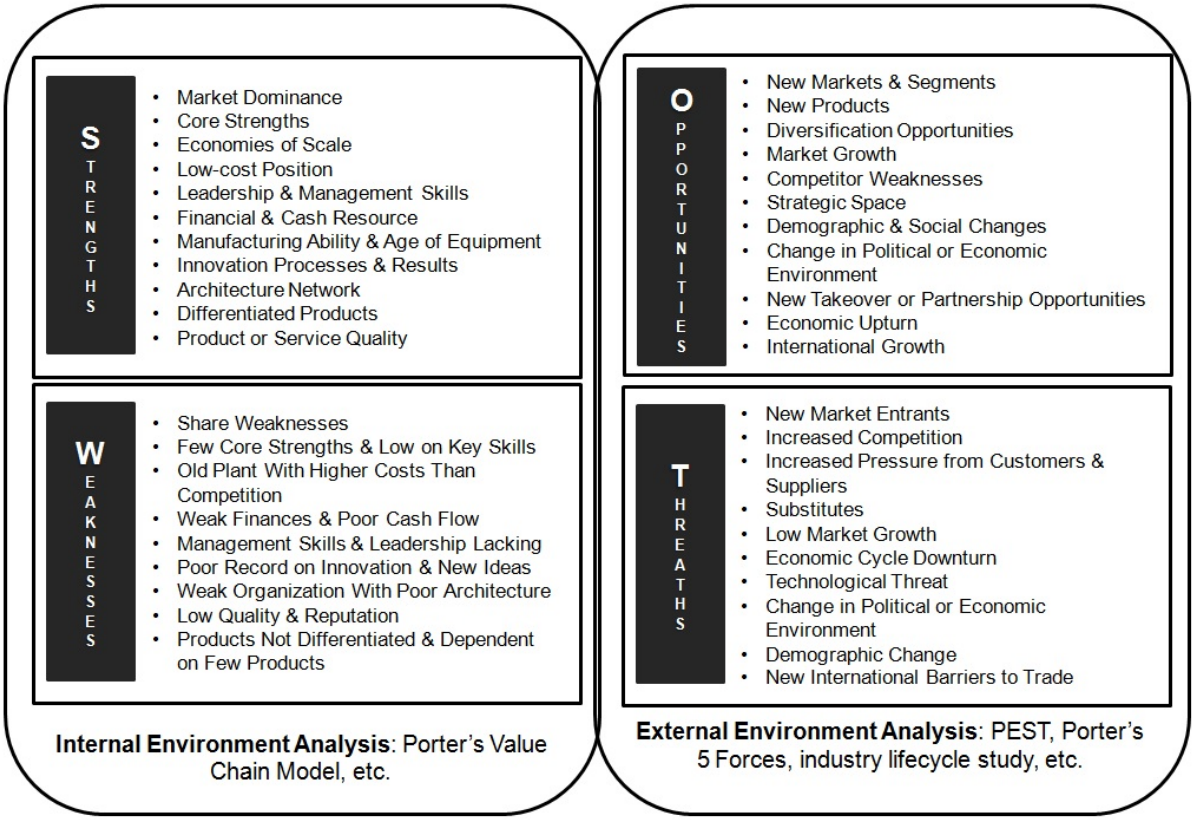


Exhibit 5.6 – The SWOT Model
Source: Lynch, 2006, page 450

The different strengths, weaknesses, opportunities and threats found must be explained and detailed. Indeed, what makes the SWOT a useful analysis is identifying the strengths which allow taking advantage of the opportunities and reacting against the threats. Similarly, the weaknesses identified should be taken into account to find out how to adapt to the opportunities and defend from the threats.

As a consequence the strengths should represent our competitive advantages while the weaknesses the competitive disadvantages.

The literature also presents many different critics to such model.

Two common misconceptions were identified (Lynch, 2006): first, assuming the absolute correction of what is written in a SWOT matrix. This model must be filled and then used with strategic judgment: as organizations operate in a fast changing environment, both externally and internally, the SWOT should be continuously updated, checked and compared with what the enterprise is surrounded by.

Second, the SWOT analysis is often mistakenly conceived as a simple list of bullets, showing the different strengths, weaknesses, opportunities and threats. However, such information without a proper explanation of every single factor could be useless and generate misunderstandings.

Additional remarks about the SWOT analysis have been found (Fernández-Balbuena, 2008). According to the author, SWOT analysis is mistakenly made at corporate level: one single SWOT matrix to guide the strategy for the whole company is generally useless and wrong. Different business units inside the same company target different market segments; besides, each business unit has its resources, advantages and disadvantages. Therefore, companies should have as many SWOT analysis and strategies as many business units they are composed by.

Moreover, considering additional studies (Dyson, 2004) a different overview on the SWOT analysis is offered: both the importance of the model in the strategic development and the necessity of additional studies are underlined. These two elements are defined a necessity and must be taken into account before applying the strategic actions which are the result of the SWOT matrix. To sum up, the SWOT analysis only is not enough to come up with a complete strategy. The evidence of it is given by the lack of a financial perspective: the SWOT analysis doesn't offer the possibility of a financial evaluation for the strategy described, although the financial evaluation is something which any change or strategy implementation requires.

Finally, the SWOT analysis shouldn't lack of future perspective, as, instead, is currently found in its application (Fernández-Balbuena, 2008). The different elements identified as strengths, weaknesses, opportunities and threats should reflect possible future scenarios: in a fast evolving environment companies cannot afford to base their strategies on present and static competitive advantages and disadvantages. The future perspective should be included in all their analysis.

Although SWOT analysis could be blamed to be an outdated technique, it is still applied in the literature (Dyson, 2004).

Besides, alternative techniques to the strategic development could be used: scenario analysis, resource-based view analysis and competency-based view analysis.

However, the SWOT analysis still offers unique features such as: high flexibility of the model, merging of external and internal perspectives and a general overview.

Indeed, both resource-based view and competency-based view have a narrower focus which would still require a SWOT analysis to complete a strategy definition. This is the main reason why SWOT is still very much used, although the model was created more than half a century ago.

5.3 From the Analysis to the Strategic Actions

Once the business unit's strengths, weaknesses, opportunities and threats are clear and have been successfully identified, it is the moment to use them in order to find out which are the practical and most convenient actions to undertake.
Additional models are no longer needed, since the findings obtained from the SWOT combined with some creativity and analytical ability are all the inputs needed to complete this step.
The definition of the strategic actions, indeed, consists in combining the different dimensions of the SWOT by comparing them, thinking about possible links, etc.
A structural way to conduct such comparison was found in the literature analyzed (Fernández-Balbuena, 2008), it will be presented in the following paragraphs.

First of all, every strategic action which will be obtained has to come from considerations over both an internal (strengths, weaknesses) and an external (opportunities, threats) factor of the SWOT analysis, leaving one of the two dimensions out of the picture would compromise the correctness and significance of such action.
With that in mind, the different dimensions of the SWOT analysis can be compared in order to find out if they suggest any field, in the business, where the enterprise can obtain a competitive advantage over the competitors.

The output of the analysis must be in a list of four groups of strategic actions, obtained in the following way:

- Offensive strategy: the first group of strategic actions identified will give the company the possibility to be offensive in the industry.
  The strategic actions here can be identified by looking at the identified strengths and opportunities of the SWOT matrix: for each competitive advantage, it is necessary to determine if any of the identified opportunities is positively affected.
  A particular opportunity, indeed, can be exploited just if the enterprise possesses some strengths: such as competences or qualities, which represent a competitive advantage.
  The strategic actions should show the existing links and explain how the strengths should be exploited in order to benefit from the opportunities.
- Reactive strategy: by taking strengths and threats into account, additional strategic actions can be identified; these will have a reactive perspective.
  These actions should show how the strengths can be used in order to react against the existing threats. Therefore, for each threat, a strength must be taken into account in order to determine

whether it can be used to react against that particular threat or not. The action should then explain how this could be achieved.

- Adaptive strategy: the SWOT dimensions necessary here are the weaknesses and the opportunities; they will be used with the purpose of identifying if, for any weakness, the exploitation of any of the identified opportunities is prevented.

  If that is the case, then, a particular action should be defined and dedicated to provide a solution to the problem. Such solution will not be aimed at improving the company's situation in that particular weak dimension, but at offering a way to avoid the consequences of the weakness in the short term, enabling to exploit the opportunity as soon as possible.
- Defensive strategy: in order to identify defensive strategic actions, the dimensions which need to be analyzed are the weaknesses and the threats. For each weakness, a threat must be considered: if, due to that particular weakness, the threat can turn up to be a real problem, a *negative* link can be found. Once all the links are found, then, the defensive strategic actions will have to provide a way to avoid the consequences coming from the particular weaknesses. Similarly to the adaptive strategy, here the goal is not looking for corrective actions or ways to improve the weaknesses; the goal is finding a way to avoid that the consequences coming from particular threat will become a problem due to one of the weaknesses.

The bullets described give origin to a process, which can be summarized in the following way: SO-ST-WO-WT where each letter is a dimension of the SWOT: strengths (S), weaknesses (W), opportunities (O), threats (T). With a cross-analysis over the couples described, a particular group of corrective actions can be obtained, as shown in the following table (Table 5.1).

<table>
<tr><th>SWOT</th><th>Strength 1</th><th>⋮</th><th>Strength n</th><th>Weakness 1</th><th>⋮</th><th>Weakness n</th></tr>
<tr><td>Opportunity 1</td><td colspan="3" rowspan="3">Offensive Strategic Actions</td><td colspan="3" rowspan="3">Adaptive Strategic Actions</td></tr>
<tr><td>...</td></tr>
<tr><td>Opportunity n</td></tr>
<tr><td>Threat 1</td><td colspan="3" rowspan="3">Reactive Strategic Actions</td><td colspan="3" rowspan="3">Defensive Strategic Actions</td></tr>
<tr><td>...</td></tr>
<tr><td>Threat n</td></tr>
</table>

Table 5.1 – From the SWOT analysis to the strategy: How strategic actions can be identified
Source: Fernández-Balbuena, 2008, page 76

The results obtained with the cross-analysis will be the possible strategic actions which a business unit can implement in order to adapt or take advantage of the opportunities and defend itself or react against the threats.

5.4 Conclusion to the Literature Review

The literature review has presented all the models and theories which will be used in the research in order to answer to the research question.
Additional models exist in the literature and are designed to be of help when analyzing the strategic environment in order to define a strategy.
They have been also taken into account: after having investigated the literature about industry life-cycle, Arthur D. Little Model, BCG Matrix, and after having compared all these models with the ones described in the chapter, these have not been included in the research. The models presented in the chapter have been judged as the ones which could add more value to the research, considering the particular topic chosen.

This is also the end of the literature review.
The next chapter is dedicated to the research: first, its structure will be presented; then the models will be applied; finally, the conclusions will be presented.

6. Research Findings

This chapter is dedicated to the research which has been developed on the topics defined, with the methodology presented and using the models and the theories described in the literature review.
The chapter consists of three parts: first, the Telco strategic environment in Europe will be analyzed; then, the second part is dedicated to a case study involving Telefónica Global Solutions in order to show, via a SWOT analysis, the consequences that the results of the analysis have on the company; lastly, the third part is also the conclusive part of Telefónica's case study, showing which strategic actions have been identified for the company.

6.1 The Telecommunications Strategic Environment in Europe

The section is dedicated to the presentation of the analysis of the Telco strategic environment in Europe. A general method to analyze the strategic environment has been proposed by Lynch, (2006) and presented in the section 5.1 of the literature review.
However, such process has been modified and adapted to the purposes of the research: first of all, the findings coming from the studies of Fernández-Balbuena, (2008) have been merged to the existing process obtained by Lynch, (2006). Second, some of the models presented in the original process would not help with useful findings in order to answer the research question (presented in section 4.1). The research requires a more focused analysis with the use of those specific parts of the process dedicated to show the changes which the new regulations and new technologies bring to the external environment and, consequently, to the strategy.
For such reason, only some stages of the process have been included in the research in order to allow a higher level of detail when adopting the models. The stages which have been included are the following: the analysis of the competitive environment; the identification of critical success factors for the industry and of the important factors for the competitive balance of power in the industry.
They have also been re-organized: the process will start with the macro-environment analysis (PEST model) and micro-environment analysis (Porter's Five Forces model), which will be applied in order to identify the CSFs for the industry.
Then, the internal analysis will be performed and the key value-adding activities will be identified, for the industry as a whole; this is a redefinition of the seventh step of the original version of the process: the competitor analysis. In the research such step has been limited to describe the general way competitors work, with a representation of a generic Porter's Value Chain for the industry.

The following exhibit (Exhibit 6.1) offers a graphical representation of the process which will be followed in order to analyze the strategic environment. For sake of completeness and to show the logic behind these adjustments, the different steps of the environment analysis have been linked to the model adopted in the analysis of consequences on the. The links has been described in the literature review - section 5.2.1.

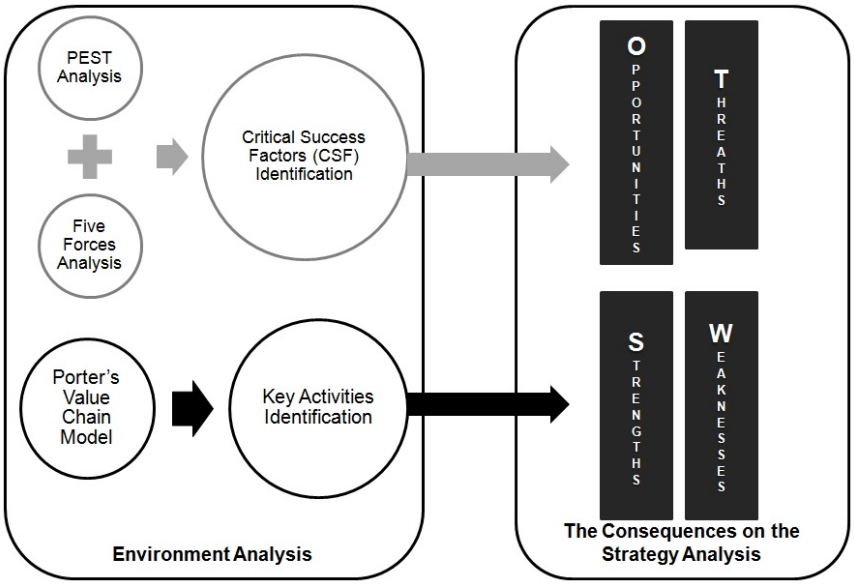


Exhibit 6.1 – Analysis of the Strategic Environment: Process Adapted to the Research
Source: Author's elaboration, adapted from Lynch, 2006, page 80

The next four paragraphs will be dedicated to each phase of the process, respectively, considering Porter's Value Chain Model and the key activities identification as one single phase. The tools shown will be applied and the consequences of the findings will be analyzed in the next sections, following the right part of the process shown (Exhibit 6.1).

6.1.1 Competitive Environment Analysis: PEST Analysis

The analysis of the strategic environment starts with the first step, focused on analyzing the competitive environment. This will be done through a PEST analysis: each of the factors which affect the competitive environment will be analyzed and, by merging the findings correspondent to each dimension, the global picture of the competitive environment can be obtained.

6.1.1.1 Political Future

The political factor of the European Telco market nowadays mainly consists in laws and regulations. This scenario is very different if compared to the past, when governments had active interests in the

business as they owned part of the companies which were operating in different monopolies, as described in section 2.1 of the research.
Nowadays, although governments still have some *golden share* in order to keep under control any possible attempt of hostile acquisition of the Telco companies, the trend has changed. A proof of how that is offered by the Eurotariff: governments (European Commission, 2011) have recently introduced a set of regulations in order to set maximum limits for prices of the roaming services offered by the Telco companies. These regulations have a great impact on the Telco environment: this is why the Eurotariff will be considered the main political factor in the PEST analysis.

The following part of the section is dedicated to the understanding of the Eurotariff, showing the imposed rates in detail and their consequences.
The last part of the section is dedicated to the second main aspect of the European Political scenario.

The international roaming - commonly called roaming - is the service which allows a customer of a MVNO (Mobile Virtual Network Operator) to obtain the same Telco services available in the domestic country, in a foreign country, from a local different MVNO. Basically, Roaming services allow the use of a mobile phone number in a different country, where the operators which provide Telco services are different from the ones in the home country.
There are three categories of roaming services: voice calls, SMS and finally data traffic (the use of internet, etc.).
Such roaming services are bought and sold among the MVNOs: indeed, an MVNO has first to buy the service from a foreign MVNO; then it can resell it to its customers, who want to communicate with or from that country.
Therefore, a distinction is made between wholesale roaming services - the first ones described, among MVNOs only; and the retail roaming services - the second ones described, sold from MVNOs to the customers.

According to the European Commission (European Commission, 2011), the roaming market is quite relevant in terms of size: as of 2009, the total European retail roaming market accounted for 4,777 billion of euros in revenues.
Considering the size of the whole European mobile market (of 164 billion of euros), then the roaming revenues represented the 3,68% of the total.

Roaming services, in particular the ones which allow the receiving of phone calls, were found to be too expensive within Europe since the mid of 1999. Several surveys and studies were performed in order to have a better understanding of the topic and, in May 2005, the roaming of phone calls received was

officially judged too expensive without a clear justification: this was said to be harmful for the competitiveness and the consumption of such service.

In March 2006, the European Council stated the importance of limiting the prices of international phone calls: although some companies designed individual plans to reduce the prices for their roaming services, a general industry response seemed to be lacking and therefore official regulations were planned: the European Council started thinking about a possible intervention in order to improve the situation of the market.
The first concrete proposal of new regulations occurred in 2007 (IP/07/870) (European Commission, 2011), consisting in a set of price limitations both for wholesale and retailing international calls: the term *Eurotariff* was born, meaning a commonly agreed maximum tariff for international calls within Europe. The proposal was approved and the current prices had to be updated to the new limits within the end of summer 2007.
In addition, the regulation forced each MVNO to send personalized information to the customers, giving the details of the *new* roaming services prices: such information had to be free of charge.

In 2009, the European Council extended and modified the 2007 regulation (through the IP/09/1064 and MEMO/09/309) (European Commission, 2011): first of all, the tariffs defined one year before resulted to be still too expensive; second, the European Council was evaluating if a similar problem could exist and be solved concerning the SMS: sending a SMS from abroad or to a foreign number was very costly and yet not regulated.
As a consequence, first of all, the Eurotariff was extended to 2012, with a yearly gradual decrease of price and second, the European Council investigated the average SMS prices obtaining the public opinion - both from companies and end-users (through questions and surveys). Although the majority of MVNOs was against a reduction of the price of SMS, a high number of smaller operators and the majority of the end-users believed that SMS were becoming too expensive, when sent from abroad or to a foreign number.
Therefore, a *Euro-SMS tariff* was defined: likewise the international calls, such tariff represented a limit to the SMS price an operator could charge.
Such limit, together with the new lower Eurotariff, had to be active starting from summer 2009.

Later on, a similar regulation was approved again in 2011: with the EU 2020 Strategy program, defined in 2010, Europe had to (European Commission, 2011):

"(...) be turned into a smart, sustainable and inclusive economy delivering high levels of employment, productivity and social cohesion (...)"

The best way to create a social cohesion, from the roaming services perspective, was to continue with the tariff regulations approved so far. Therefore, the 2008 regulation was taken as a model and, with the same logic, the price-limits for the roaming services were further reduced. Besides, the data traffic service was included in the regulation and price-limitations for such service were established too.
These new agreed price limitations will be valid till 2016.

All the regulations set upper price limits but also reminded that MVNOs were free to charge the customers with lower prices, stimulating, in this way, competition in the Telco market. Besides, end users, when abroad, were allowed by law to choose which roaming plan or operator was the best, according to their needs: they were not forced to accept the prices offered by the mobile operator they had in the home country. At zero cost, end-users were allowed to switch to a different operator, benefiting from its roaming services and keeping the same phone number.

In the following tables (Tables 6.1, 6.2), a summary of the price reduction for the roaming services, established by the regulations described above, is shown, both for the retail roaming services and the wholesale ones, respectively (European Commission, 2012):

Tariffs (€ without VAT: Period:	Eurotariff Voice-call Making (€/min)	Eurotariff Voice-call Receiving (€/min)	Euro-SMS Tariff: SMS sending	Euro-SMS Tariff: SMS receiving	Data traffic (€/MB)
Summer 2007	0.49	0.24	-	-	-
Summer 2008	0.46	0.22	-	-	-
Summer 2009	0.43	0.19	0.11	0	-
Summer 2010	0.39	0.15	0.11	0	-
Summer 2011	0.35	0.11	0.11	0	-
Summer 2012	0.29	0.08	0.09	0	0.70
Summer 2013	0.24	0.07	0.08	0	0.45
Summer 2014	0.19	0.05	0.06	0	0.20
Summer 2015	0.19	0.05	0.06	0	0.20
Summer 2016	0.19	0.05	0.06	0	0.20

Table 6.1 – Price limits for retail roaming services according to EU regulations
Data: European Commission, 2012

Tariffs (€ without VAT: Period:	Eurotariff Voice-traffic (€/min)	Euro-SMS Tariff: SMS-traffic	Data traffic (€/MB)
Summer 2008	0.28	-	-
Summer 2009	0.26	0.04	-
Summer 2010	0.23	0.04	-
Summer 2011	0.20	0.04	-
Summer 2012	0.14	0.03	0.25
Summer 2013	0.10	0.02	0.15
Summer 2014	0.05	0.02	0.05
Summer 2015	0.05	0.02	0.05
Summer 2016	0.05	0.02	0.05

Table 6.2 – Price limits for wholesale roaming services according to EU regulations
Data: European Commission, 2012

In the tables (Tables 6.1, 6.2) it is possible to see how the regulations described above design a so-called *light-path* which the different operators need to follow in order to gradually reduce the prices of their services and conform to the limits imposed.

The price evolution will be presented in detail, for the retail roaming services and in the following graph (Exhibit 6.2) it is possible to see the lightpath:

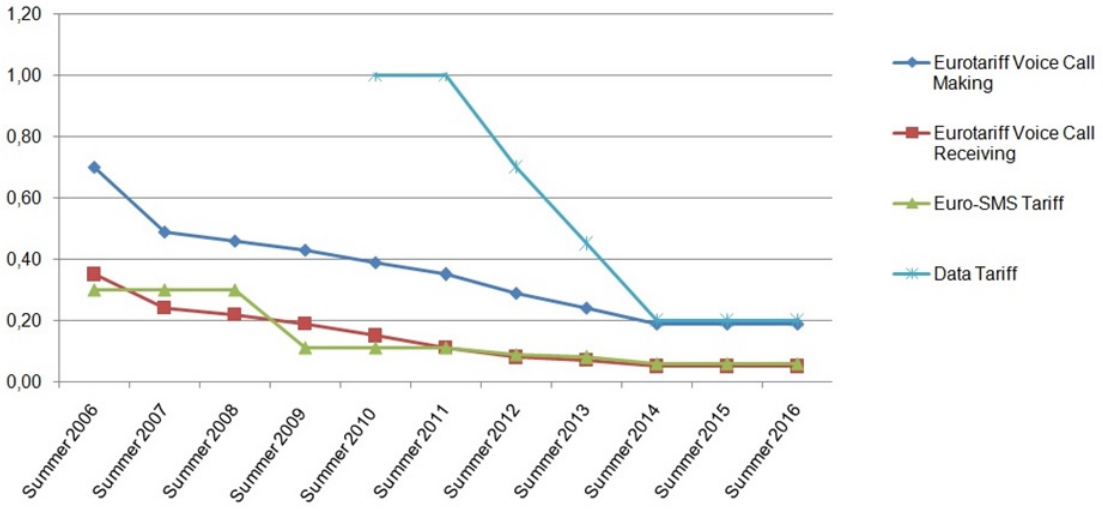


Exhibit 6.2 – Retail Roaming Services Lightpath
Source: Author's elaboration; Data: European Commission, 2012

The initial tariffs for the roaming services, before the last regulations were approved (2006-2012), are taken from the European Council website and consist of an average price, offered by the MVNOs in Europe. Finally, the lightpath for the data tariff is shown starting from summer 2010 as no regulations from 2006 to 2010 existed for such service.

The main consequences of the introduction of the regulations described will be now presented.
First of all, the new price limitations imposed, provoked a loss in the revenues coming from the roaming services for most of the MVNOs. The loss occurred on all the three categories of services (phone calls, SMS, data). Some data are available for the period of time between 2007 and 2009: the voice roaming fell of 3,2% in terms of revenues, due to both the lower price imposed, but also the lower volume demanded by the users. Revenues on SMS roaming decreased as well, although the volume of roaming SMS sent increased significantly of 23,1%. The same result was obtained concerning the data traffic: despite an increase in volume of 43,6% the total revenues coming from such service fell.
The data shown, points out how the end users benefited from the regulations: a general increase in the volume of the roaming services used, means that the new prices, imposed by the regulations, are closer to what the users are available to pay for such services. The decrease in the volume of the voice call, instead, can be due to the tendency of preferring avoiding the costs of a call and replace it with a SMS or data message, which became, at the same time, much more convenient than before.

In order to give a numerical idea of the savings the new lower tariffs can offer to the end-users, an example will be given.
It is possible to assume that an Italian businessman/woman, who is travelling to France for 2 days, will use the mobile roaming services (from the Italian number) in the following way (Table 6.3):

	Summer 2008 tariffs (20% VAT assumed)	Summer 2013 tariffs (20% VAT assumed)	Savings
6 calls made of 2 minutes each	€ 6,62	€ 3,46	*€ 3,17*
3 calls received of 2 minutes each	€ 1,58	€ 0,50	*€ 1,08*
Daily download and replying of e-mail (3MB per day assumed)	€ 18,00	€ 3,24	*€ 14,76*
Daily check of maps (7MB per day assumed)	€ 63,00	€ 11,34	*€ 51,66*
3 SMS sent	€ 0,90	€ 0,29	*€ 0,61*
Totals	***€ 90,11***	***€ 18,83***	***€ 71,28***

Table 6.3 – Example of savings estimation after the introduction of the regulations
Source: Author's elaboration; Data: European Commission, 2012

The price of an SMS for the year 2008 was assumed to be 0,30€, VAT included while the cost for 1MB of data traffic was assumed to be 2,5€ VAT excluded.
The assumption of 20% VAT can be justified as a proxy of the average VAT between France and Italy (the two countries involved in the example).
If the prices profile of the year 2008 are compared to the ones of the year 2013, it is possible to see how the regulations allow very high savings (71,29€) even for low usage of the phone.

Coming back to the political factors, thanks to the regulations, specific objectives were achieved, affecting the market.

First of all, the distortions among the European states were reduced, making Europe a more equilibrated market. Moreover, thanks to a regulated level of prices, an optimal level of governance was ensured. Third, the competition in the market was successfully stimulated, making sure that the technological developments were not hindered: the availability of roaming services improved and the technical barriers were reduced, allowing the most efficient technological solutions to be developed and spread.

Indeed, no additional cards or equipment were necessary to call a foreign number: end-users sopped looking for cheaper ways to call or communicate with their home countries as roaming services became more convenient than before.

Forth, a higher transparency was assured to all the users, enabling them to choose more easily among the different possibilities, offered by the operators. End users could also successfully monitor their roaming expenditures without incurring in additional costs.

To sum up, end users could benefit from new cheaper prices which better reflected the costs behind such services offered. At the same time, the difference between the roaming and the domestic tariffs was reduced and the demanded volume of roaming traffic has been increasing since the introduction of the Eurotariff.

Apart from the Eurotariff, the political scenario is also influenced by the tensions existing between the governments and some Telco companies such as incumbents, mainly.

Incumbents are showing their concerns regarding the way European Telco market is regulated, which is, according to them (Porras, 2013), disproportionate compared to other new operators: the OTTs (Over-the-Tops) (mainly represented by Skype, Google, Facebook, WhatsApp, etc.), which are growing a lot in the Telco industry all over the world, Europe included.

In 2000, the FCC (Federal Communications Commission) has classified OTTs and MVNOs as belonging to two different types of providers. On the one hand, the services which allow voice and data to be exchanged over the internet (NGN) have been classified as *information services*; this type of services can be considered as a sub-section of the general telecommunications services or components. On the other hand, incumbents and the MVNOs in general, which offer the classic services over the PSTN, have been classified as *electronic communications operators*.

This distinction, apparently just related to formality and bureaucracy, has revealed to be fundamental, instead. According to the FCC, any company classified as an *electronic communications operator* needs to respect specific regulations, mainly regarding service quality, pre-defined tariffs (Eurotariff) and access to interconnection of funding of the universal service. On the other hand, any company offering *information services* doesn't need to respect such regulations.

This different treatment has provoked a lot of tensions and complaints between incumbents and governments, also due to the popularity and the market share which OTTs are gaining over the *electronic communications operators*.

Some examples (Porras, 2013) can be represented by the French regulation institution, named Arcep (Autorité de régulation des communications électroniques et des postes), which, considering any VoIP service provider as an *electronic communications operator*, denounced Skype for failing to respect the regulations imposed to the *electronic communications operators*. Doubts on the issue have been also casted by the Irish and the Austrian regulators: the latter requested a new updated European framework which should consider the new market situation and the OTTs issue.

Besides, as denounced by some European regulators, such situation is putting the OTTs in a more favorable position (Porras, 2013) - the evidence of it will be described just below.
First of all, by keeping the two distinctions, as of now, there is a lack of interoperability among the electronic communications operators and the companies offering information services. Customers of Vodafone, for example, cannot interact (by calling or sending messages) from their mobile or fixed numbers with a Skype or WhatsApp user. The lack of interoperability and the limited or absent costs for the information services make customers prefer to use Skype or WhatsApp, rather than SMS and classic voice calls. As denounced by some European regulators, such situation is contributing to a replacement of services (Porras, 2013).
Second, the lack of regulations is putting the OTTs in a more favorable position, even from a financial point of view: the quality of service doesn't need to meet any specific value or regulation and, as a consequence, this doesn't force OTTs to invest, maintain and worry about the infrastructures they use to provide their services. OTTs don't need to own or build their own infrastructures but they can rely on the one existing (and owned by the big Telco multinationals). Moreover, investments which could ensure to the final users a better service, with a minimum or in general higher level of privacy and data protection are also not imposed. Finally, despite the fact that some OTTs are charging their customers with some costs (examples are represented by some services of Skype and by WhatsApp, which has recently introduced a commission fee after the first year of free use), they are not controlled by the Eurotariff and, theoretically, OTTs don't need to respect any price limitation for their services.

6.1.1.2 Economical Future

An idea of the European economic environment can be given by looking at the value of the GDP over the last years. The GDP is (Oxford University Press, 2008):

"(...) the total value of goods produced and services provided in a country during one year (...)"

This is a relevant indicator in economics as it shows how much an economic system is able to produce: the higher the production capacity is, the more goods and services will be offered to the markets and, as a consequence, higher revenues will be obtained.

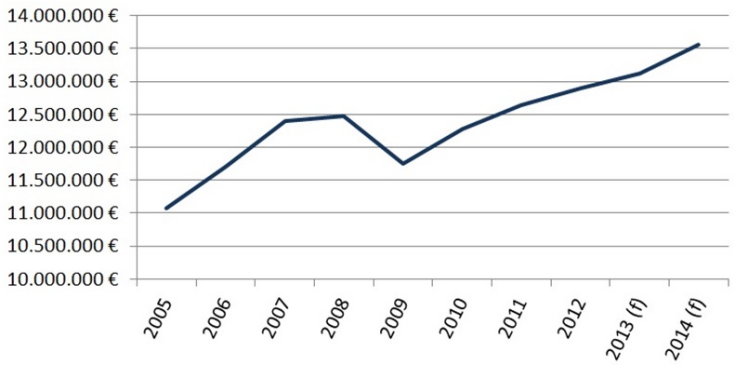


Exhibit 6.3 – European Union GDP in million of €
Source: Author's elaboration; Data: Eurostat, 2013

According to the values shown, for the last years (Exhibit 6.3) (the data for the years 2013, 2014 are forecasted (f)) (Eurostat, 2013), there can be a certain degree of optimism concerning the future of the European economy: the depression due to the 2008-2009 financial crisis seems to be overcome and the values of GDP are coming back to have a positive trend again.

Another relevant indicator which can be considered in an economical analysis is the GDP per capita: the indicator derives from the GDP just described and it expresses how the total value of goods produced can be equally distributed among the population of the geographic area considered. This indicator has an important meaning for the firms as it gives an idea of the purchasing power of the average citizen within the geographic area.
In the following exhibit (Exhibit 6.4) a comparison of the GDP per capita of the last years is given (World DataBank, 2013). Different geographical areas have been included in the comparison in order to show how Europe can be still considered an attractive economy, where the purchasing power of Europeans is supposed to be among the highest (together with North America), making Europe one of the most attractive market for firms.

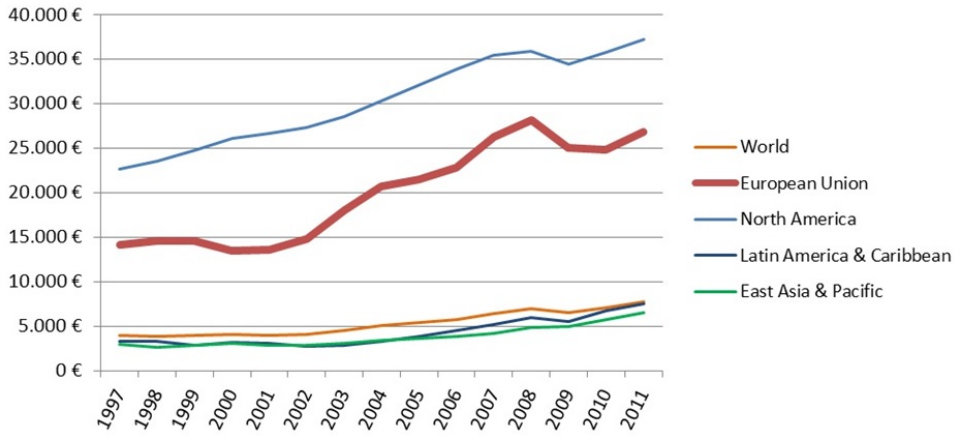


Exhibit 6.4 – GDP per capita in €
Source: Author's elaboration; Data: Eurostat, 2013

Telecommunications services are regulated by the Eurotariff, throughout Europe, as described in the Political factor. The consequence is that such services will be cheaper and cheaper both for the final customers and for the Telco operators (who will be buying the use of other MVNOs' networks at lower rate but who will also be forced to sell the same services at lower prices).
Concerning the retail side of such market, it is possible to compare the opposite trends for the GDP per capita and the one followed by the price of Telco services: the market prices of product and services will follow a decreasing trend while the GDP per capita is expected to grow, following an increasing trend.
As a consequence, it is possible to assume that the volume of the customers who will be willing to buy and use such services will increase, due to the fact that potential customers should benefit from a higher GDP per capita, meaning an increased buying or purchasing power.

The prices for the mobile services, in particular for the mobile internet traffic packages, are also decreasing, due to a very high competition and a shift in the pricing strategy, as remarked by the researches performed (Weidinger, 2013). Indeed, the entry level price for the mobile broadband has declined of 6% over the last quarter of 2012: this was also caused by operators, who have been changing their offers and the way they are charging the customers for the data traffic packages.
Customers have always been used to be charged according to the volume of data downloadable by their mobile phones in a certain period of time.
However, with the next introduction of the 4G-LTE high speed internet connection, operators have modified the services offered: while some carriers have simply decided to include different speed options among their current internet packages (which were differentiated by volumes), other carriers decided to stop differentiating their packages according to the volumes of data and start

differentiating them according to the connection speed only (an example is represented by Elisa Finland[1])[2].

Moreover, some operators even stop distinguishing between 3G technologies and 4G-LTE ones (Weidinger, 2013): they have all been included under a *high-speed* service tag, with a lower price than the entry price of the 4G-LTE only. Customers choosing high-speed connections will sometimes get a 3G connection and sometimes get a more powerful 4G-LTE connection, paying a bit more than the slower 2G technology.

All these changes have definitely contributed to raise the competition after the introduction of 4G-LTE technology. They have also negatively affected the prices for mobile internet packages, which have generally reduced. Competition is not expected to decrease and therefore, a further reduction of prices is expected to occur making the internet connection on mobile phones almost free.

6.1.1.3 Socio-Cultural Future

The socio cultural dimension of the Telco market has been affected by a change of needs and communication habits, especially in the mobile communication segment.

Some years ago, communicating with friends and relatives consisted in SMS and short phone-calls; nowadays, instead, the preferred channel used is the internet, exploitable by the multitude of applications which can be used on smartphones and which are offering more convenient solutions to SMS and MMS (Multimedia Messaging Service): some examples of such applications can be WhatsApp or Facebook messenger. These applications allow the user to send text messages with pictures, audio data and video data to another user, over the internet and with very user-friendly and attractive interfaces.

Even phone calls can now be replaced by VoIP phones or even applications, such as Skype, Viber or the functionalities offered by Google+ (Google plus).

While, in the past, users were constrained by the limited numbers of characters which could be contained in one SMS or by the cost per minute of a phone call, nowadays, after the payment of an internet fee, users can benefit from a very high or even unlimited amount of data which can be sent and received through the IP, reaching fixed, mobile phones and computers.

The one just presented can be defined a real change in people's lifestyle, as found out by Telefónica, which has shown the following graph (Exhibit 6.5) during a presentation held by its CEO (Alierta, 2010).

[1] Elisa Finland offers unlimited amount of downloadable data to its customers but different speed options (Weidinger, 2013)

[2] More about the pricing strategy will be presented in section 6.3.1

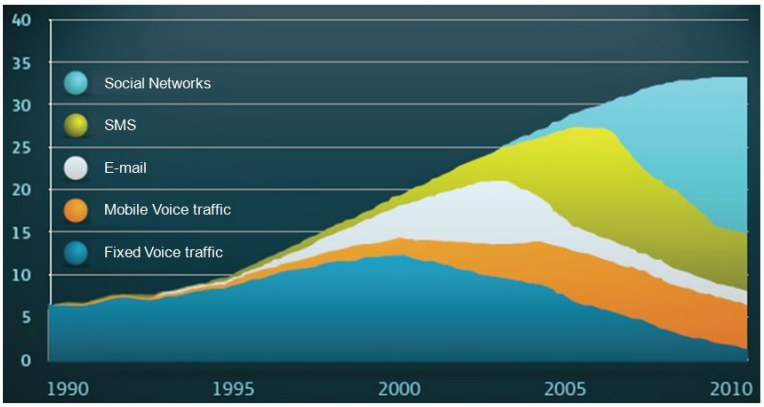


Exhibit 6.5 – Distribution of the hours dedicated to the communication per channel (data collected among the young UK citizens between 15-25 years old)
Source: Alierta, 2010

In the graph (Exhibit 6.5), it is possible to see how time is spent weekly on the different communication channels by the young people in UK, in particular between 15 and 25 years old.
The graph clearly shows the drop in popularity of the SMS and voice traffic caused by the spreading of new more convenient channels such as social networks and NGN.
The data are available just till 2010; however, nowadays, social networks have been even overcome - in terms of popularity - by other applications. Indeed, as stated (ANSA, 18th April 2013) by the WhatsApp CEO Jan Koum, in April 2013, WhatsApp has overcome well-known social networks such as Twitter and Facebook in terms of users: WhatsApp claims to have reached more than the 200 millions monthly users reached by Twitter; this is true also for messages: the daily messages which are exchanged on WhatsApp are claimed to be 18 billion, more than the ones exchanged on Facebook.

To sum up, it is possible to conclude that the internet is gaining popularity over the telephone lines, even in terms of number of users, as shown by the comparison in the following exhibit (Exhibit 6.6) (World DataBank, 2013):

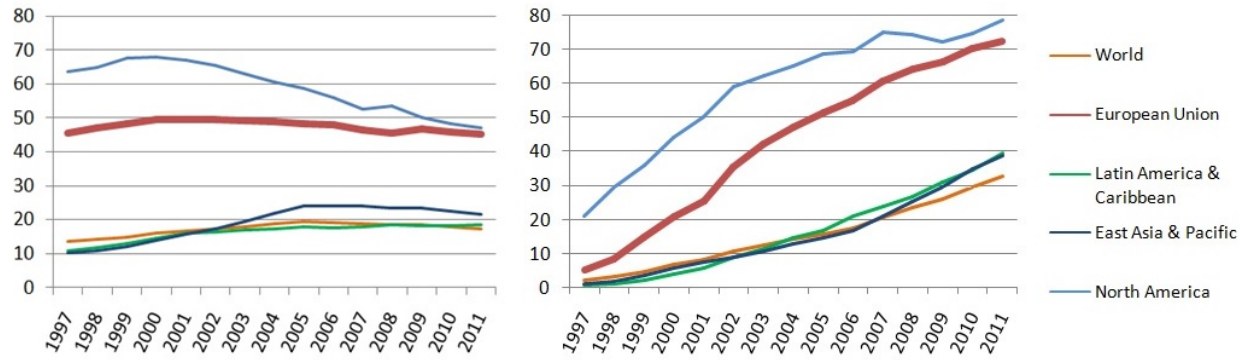


Exhibit 6.6 – Comparison between Telephone lines users (% over 100 people) on the left & Internet users (% over 100 people) on the right
Source: Author's elaboration; Data: World DataBank, 2013

Telephone lines are defined, by the world data bank, as those fixed telephone lines that connect a subscriber's terminal to the public switched telephone network and that have a port on a telephone exchange (including integrated services digital network channels and fixed wireless subscribers).
By comparing the two set of data, the two different trends are very clear: on the left, the percentage of telephone line users has not been growing during the last years, and in some cases it has been decreasing; on the right, instead, the percentage of internet users is increasing year by year and all over the world, Europe included, although the percentage of internet users is already high (72,37% in 2011).

This theme is very important as it can represent a key issue to follow market trends and gaining market shares over the competition. Indeed, many surveys and research have been done about the topic, by operators and telecommunications equipment providers.
Ericsson (Akamai Technologies, 2012), for example, has recently investigated its own customers from all over the world in order to find out about their traffic volumes and usage patterns; the following exhibit (Exhibit 6.7) shows the findings: in detail, Ericsson has measured the amount of traffic (in Petabytes per month) uploaded and downloaded by its customers' mobile phones for voice calls and data traffic[3].

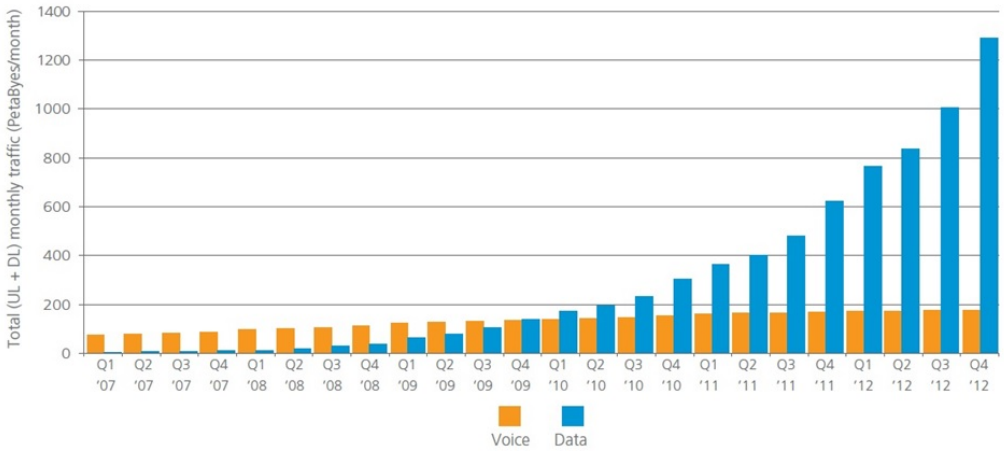


Exhibit 6.7 – Total Monthly Mobile Voice & Data Traffic – Measured by Ericsson
Source: Akamai Technologies, 2012 - page 33

The findings are quite impressive: it is possible to notice how mobile data traffic doubled from the fourth quarter of 2011 to the fourth quarter of 2012. In detail, the net growth, recorder from the third to the fourth quarter 2012 was of 28%.

[3] The technology included in the analysis were: 2G, 3G, 4G/LTE – not Wi-Fi

To sum up, in order to finish the socio-cultural analysis, it is possible to mention that the main finding obtained is that a change in the customers' preferences and life-habits has occurred, regarding the communication channels daily used. This consists in a *switch* from SMS, MMS and voice traffic to data traffic.

6.1.1.4 Technological Future

The VoIP (or NGN) and the use of data as a communication channel is taking over the traditional communication methods: new applications and technologies are allowing more convenient ways of communicating by exploiting the internet.
In addition to that, there're other factors which can be considered when analyzing such strategic environment from a technological point of view.

First of all, internet use and popularity, especially on the mobile phones, will keep growing: according to Cisco researches and forecasts (Cisco Press Release, 2013), the worldwide mobile data traffic will increase 13-fold over the next years. Technology will also contribute to such growth by offering better solutions such as: better devices, faster and more reliable connections, broader coverage and a stronger compatibility which, in particular, will allow the interaction between devices. Indeed, for the future, the internet of things (M2M connection) is expected to boost, enabling the connection among the different devices such as mobile phones, white goods, computers, cars, etc. over the internet both for the final customers and for the enterprises.
An example of that is represented by the number of devices which nowadays are produced with SIM cards incorporated, allowing the communication and interaction with other machines: cars, for example, can be geo-localized thanks to the SIM cards they have incorporated; with a similar method, vending machines can communicate to a central office that they are running out of a particular product, etc.

Connection speed is also expected to keep improving, both for fixed and mobile lines: on the one hand, mobile carriers are spreading 4G wireless technologies (such as LTE) and, in the future, they are expected to replace the older and slower 2G and 3G technologies.
On the other hand, the demand for faster fixed internet connection is growing: in particular, researchers (Porras, 2013) have shown how the growth of the demand for the fiber connection is much higher than the one for ADSL (Asymmetric Digital Subscriber Line) connection. Fiber is a solution which is more expensive than the ADSL, as it exploits a different technology allowing much more speed and bandwidth. The cost of a fiber connection is also depending on how close to the router the fiber is located: a customer can choose such feature, requiring to the telecommunications carrier to

link its home telephone line directly to the fiber or keeping the end part of the connection[4] made of metallic cables. Generally, the fiber access point can be placed in the basement of a building or in a particular point of a street. Of course, the closer the fiber is to the router, the more expensive the connection will be. The different alternatives for installing a fiber connection are all grouped under the FTTx (Fiber to the x) generic acronym, where the x letter stands for the different options: some examples are, FTTS (Fiber-to-the-street), FTTB (Fiber-to-the-building or Fiber-to-the-basement), FTTH (Fiber-to-the-home): these have been listed from the cheapest to the most expensive, respectively.

What is relevant from the data of the demand for the fiber (Porras, 2013) is that, comparing the figures from the fourth quarter 2011 with the one from the fourth quarter 2012, FTTx has recorded an increase of 27.5% and considering the most expensive solution, FTTH, it has recorded an increase of 20.3%. (The complete figures are available in the appendix - section C).

The meaning of such figures is that people are definitely considering internet an important service and are becoming more and more available to pay in order to have the best-of-breed solutions. The ADSL connection (slow, if compared to the FTTx), indeed, is still the most popular one but has recorded just a 3.6% increase.

Second, TV and video services over the web are recording a great and very fast expansion: the access to video contents, such as the streaming of movies, the access to video attachments and the access to video-dedicated websites (such as YouTube) is always more and more frequent.

Nowadays, the newest TVs include a Wi-Fi adapter which allows downloading such video contents and playing them directly on TV.

There is still a business potentiality in this sector, as remarked also by the researches analyzed (Swain, 2013). That's why Telco carriers, such as Telefónica, have invested in order to include pay TV services among their product and service-lines.

Third, according to Forrester Research (Mines, 2013), the level of communication-related technologies used by the enterprise will grow a lot: starting from 2013, the applications of technologies such as cloud computing, mobile enablement (consisting in: application development, higher security levels, etc.) and advanced data analysis (consisting in new and better tools which will allow to analyze and forecast demand and understand the competitive environment more effectively) will be much more popular and will guarantee a better service for the final customers, due to the possibility to reach a higher level of efficiency. This will stimulate additional demand for communication services designed for businesses and firms.

[4] The end part of the connection is considered the part between the home router to the fist fiber access point

Forth, some technological breakthroughs can be identified: two main examples are represented by the Google Glass and the so-called Temporary Social Media (Porras, 2013). These new products or services will be described, since they can indirectly contribute to further stimulate the demand for Telco services and therefore offer the Telco carriers new potential customers.

Google Glass is new special Google branded glasses which are approaching the market: these will consist of a camera, a screen, a battery, a SIM card reader and a microphone all integrated into a pair of glasses. The functionalities offered are simply astonishing for a pair of glasses: video-shooting, photograph-taking, navigation, communication and, without any doubt, further functionalities which Google will keep secret till the lunching of the product[5]. Voice commands and touch screen will allow the use of the glasses and, most incredibly, the speaker system will use a new technology *called bone conduction transducer*, which allows a wireless and non-Bluetooth sound transmission: audio will be transmitted through vibration from the cranium to the ears.

The product seems to be very innovative and attractive with the possibility of stimulating communication and the demand for Telco services.

On the other hand, temporary Social Media can be considered the next step for *classic* social media and communication: SnapChat can be considered the pioneer of this new category of social media (Porras, 2013). SnapChat is an app which allows the users to send and receive pictures with messages which self-destruct after a chosen amount of time (seconds typically). The popularity and the use of this app is growing a lot: the CEO Evan Spiegel said that users are nowadays sharing around 150 million photos per month, a figure which is much higher even than the number of pictures shared on well-known Instagram (40million a month) (Porras, 2013). The diffusion of Temporary Social Media has clear implications for the communication and Telco services market: users will feel freer to communicate as the self-destruction feature of pictures and messages will represent a way to consolidate their privacy. This innovative app is expected to contribute to boost even more the communication and the demand for data traffic (as this app is using the NGN technology to transfer data).

6.1.1.5 Conclusion to the Competitive Environment Analysis

The following exhibit (Exhibit 6.8) shows the findings obtained with the PEST analysis which has been completed. These are the political, economical, socio-cultural and technological factors which will affect the future of the European Telco industry.

[5] The product is expected to be released in the first quarter 2014 (Porras, 2013)

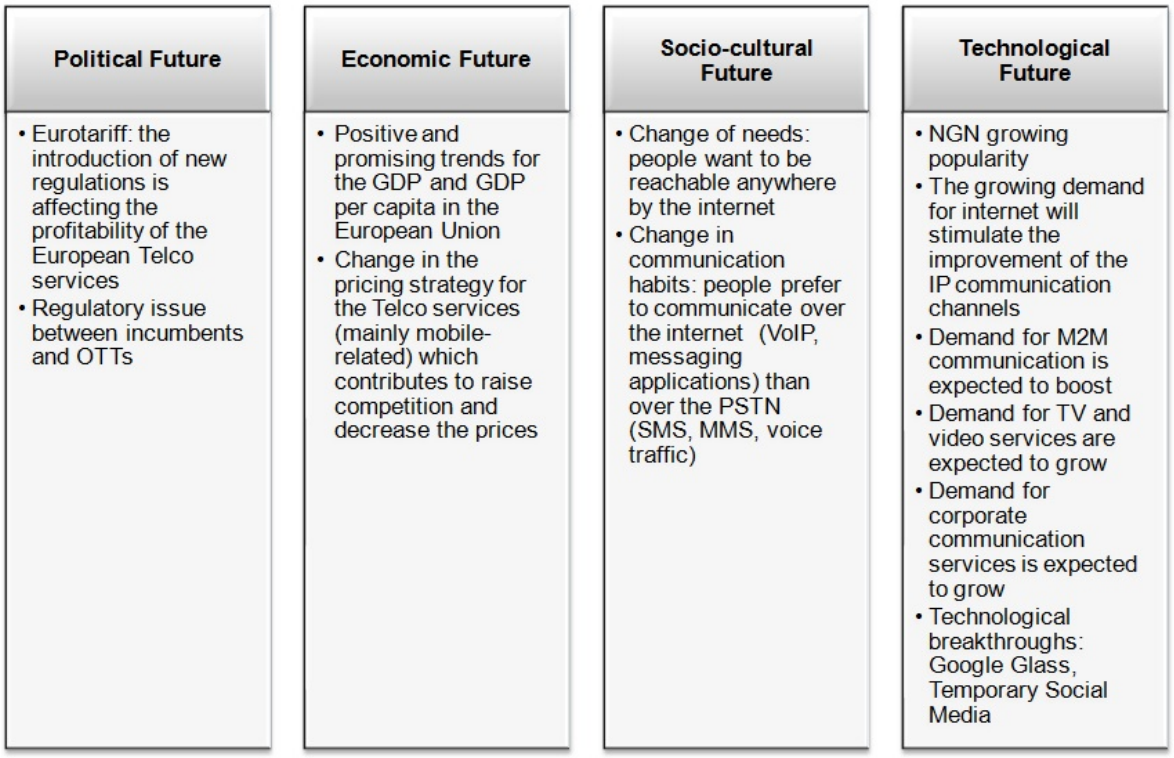


Exhibit 6.8 – PEST Analysis applied to the European Telco industry
Source: Author's elaboration

The identified factors clearly show how the Telco industry in Europe is far from having reached the maturity or a decline level: the technological future factors offer a lot of optimism as there seems to be a lot of opportunities to benefit from different growing segments of the global Telco market. These opportunities have been created by the continuous technological improvements in the industry which have lead to a change in the habits and the communication channels which people prefer to use nowadays.

This optimism seems also supported by the economical future factors, since the European economical situation is expected to improve; however, both the European price regulations and the greater competition, stimulated by the OTTs, are imposing to all the Telco carriers a higher level of efficiency and cost optimization since the revenues deriving from the current business model are expected to decrease in the next years.

To sum up, the critical dimensions which should be taken into account for the future of the European Telco industry are mainly the socio-cultural future and the technological future; the political future should be always considered in order to be aware of the changes related to laws and regulations and, finally, the analysis of the economic future doesn't seem to suggest particular risks or problems.

6.1.2 Factors Specific to the Competitive Balance of Power Identification: Five Forces Analysis

This part of the analysis is dedicated to study and understand the competitiveness in the European Telco industry: the competitiveness requires a deeper and more detailed study before moving on and thinking about any strategic action to possibly undertake.
This section will show the Porter's 5 forces studies which have been conducted over the European Telco industry: the section has been divided into 5 different parts, each of them dedicated to one of the forces included in the model. An additional part has been added at the end, in order to conclude the analysis and sum up the most relevant findings.

6.1.2.1 Barriers to Entrance

First of all, the industry needs to be investigated in order to assess how easy accessing to the industry is: it is important to determine if new investors, interested in the European Telco industry, would encounter barriers or difficulties when trying to open new businesses or acquiring existing ones. The presence of substantial barriers to entrance will protect the existing enterprise from new competitors and it is generally considered an indicator that the industry is profitable: indeed, it is logical to think that the existing enterprises developed such barriers to protect themselves from different attempts, by new investors, to enter the attractive business; if the business had not been attractive, then such barriers would not have been established; moreover, the developed level of specialization in the industry means that the existing companies are benefiting from a long history of profits and convenient businesses.
The main barrier to entrance which is faced when trying to enter the European Telco industry is the initial investment: a new company would need infrastructures in order to approach the market and sell its services. These infrastructures, even if rented, require money and specific competences which cannot be taken for granted.

Besides, it is quite impossible to think that a new operator could possess a very broad infrastructure which could link different countries; therefore, new operators would require relying on the existing infrastructures, at least at the beginning of their business history.
This could be done by paying the infrastructures' owners - which are the governments or the already existing Telco companies, and use the existing infrastructures to offer services to the end customers. Accessing to those infrastructures is not that simple though, considering that new operators would need to establish business relationships with incumbents and big companies; such companies require long-term relationships involving high volumes and money, which a new enterprise, probably of small-medium sizes, could have problems in guaranteeing. This feature, which has just been described, can

be considered another barrier to entrance, which would complicate the access to the distribution channel: the communication infrastructures, indeed, are both the way to deliver the services to the customer and the service delivered itself.

The issue just presented is linked to the cost advantages not dependent from the economies of scale, which are present in the industry. By considering the relationships among big companies, it is possible to notice that each of them can offer a route that links a particular geographical destination to another, with a certain degree of quality that can be of interest for another company and vice versa.
This mutual interest is the basis to establish good relationships via bi-lateral agreements or simple and *quick* agreements (named SWAPS), in which the companies agree on some *special* prices (lower than the normal ones) and certain committed volumes of voice and data traffic, in order to assure that route of interest.
Thanks to such special prices, companies can benefit from a cost advantage which doesn't depend on the economies of scale.
On the other hand, a small operator or investor, new to the business, wouldn't have anything to offer to a big existing company in order to convince that company to sign an agreement and offer a special price. As a result, new operators would have higher costs than bigger operators for the same service or route.

Political barriers in the European Telco industry are high: Telco operators are more and more controlled by regulations which impose them, for example, maximum price rates and minimum quality levels. Besides, although governments-controlled monopolies no longer exist and the mobile operators are nowadays private companies, governments still have a *golden share* in the incumbent companies. This information could let think that governments have some interests in the performances of some companies which operate in the industry and could have a certain convenience in *lobbying* and undertake similar actions to influence the performances of the incumbents. Moreover, new Telco operators have to be approved by governments.
Economies of scale, the possibility of differentiation of the services and the switching costs are generally low in the industry. Once the infrastructures have been built, there are no curves which can show how the increasing volumes could lower the unitary variable costs: the services offered by the Telco operators consist just in a flow of digital or electrical signals.
For the same reason, there are not many ways of differentiating the services offered to the users: on the B2B side of the market, quality can be a differentiator element and on the B2C market companies can offer different packages or monthly fee differentiating the amount of data, SMS, MMS and voice traffic. However, this is not enough to consider differentiation as a relevant element or opportunity in

the industry, it can be almost considered as a limitation and an entrance barrier to the industry: every enterprise is competing for the same services offered without clear niche markets to exploit.

A consequence of the low differentiation possibility is that *loyalty* is not very high either: the services offered to the end customers are quite the same and thanks to the portability, customers can easily change from one operator to the other, even keeping the same phone number and with negligible or no switching costs.

Despite the facts mentioned, operators have been trying to increase the loyalty of a their customers on the B2C market: mobile phones are frequently sold branded, with an operator's SIM car included or they are given at very convenient prices with a contract, which links the customer to the operator for a certain amount of years and at a certain monthly fee. The same purposes have been targeted by similar strategies which offer the customers the possibility to collect loyalty virtual points which can be exchanged for prices. Low loyalty is also a distinctive feature of the B2B Telco market: this is why agreements and volumes are committed; otherwise, operators could change suppliers with no efforts.

6.1.2.2 Rivalry in the Industry

The rivalry in the industry is very high: although the number of operators in each country is not extremely high, all the remaining features which determine the rivalry in the industry as high can be found in the European Telco industry.

First of all, if fixed and variable costs are compared, the fixed costs in the industry represent the largest portion and are much higher than the variable ones.

Second, as already mentioned in the description of the barriers to entrance (Section 6.1.2.1), the possibilities to differentiate the services offered are quite few, both on the B2B and B2C markets. This contributes to increase the rivalry, since every company offers similar and comparable products and services.

Third, the barriers to exit are also high: the assets and competences developed while operating in the Telco industry are quite specific and cannot easily converted and re-used in another different business.

Finally, the production capacity offered by the operators is theoretically unlimited: as long as the energy is supplied, the operators can send all the supported traffic over their networks. As of now, the capacity available is not excessive, however, the current total demand is well below the total capacity which can be provided, which means that the volume of demand is not a factor which could contribute to lower the rivalry.

6.1.2.3 Presence of Substitute Products

Nowadays, it is easy to replace part of the telecommunications services with other services, offered by applications and software: different companies have been very successful in basing their business on the internet and in particular on how the IP data traffic can be used also to send voice traffic and text messages, replacing both phone calls, SMS and MMS - this is done by exploiting the NGN.

The issue whether such services can be considered substitute products or direct competitors of the classic Telco services is still unsolved: indeed, as previously mentioned (section 6.1.1.1), the decision taken by the FCC of differentiating between the OTTs - considered *information services* providers - and the companies which offer services working on the classic networks - considered *electronic communications operators* - has been the cause of many doubts and complaints, due to the different regulations which are imposed to the two groups.

Anyhow, for the purpose of the research and the decision of the FCC, OTTs will be considered substitute products providers and not direct competitors of classic Telco operators.

The good news is that the services offered by the OTTs all depend on the existing infrastructures owned by the Telco companies: therefore, the MVNOs cannot be completely replaced.

OTTs, such as Skype, Viber, WhatsApp, Google as well as many other applications and platforms exploit the internet to send and receive data; therefore, they can offer a cost advantage to the customer. On top of that, such companies have been able to successfully introduce much friendlier interfaces and additional services. These features have been fundamental to create a switch in the demand of Telco services: nowadays the trend is showing that users prefer using NGN services for their daily communications rather than the SMS or MMS.

In particular, enabling the internet connection on mobile phones has paved the way to many substitute products for SMS and MMS: if an user is paying for a data plan and has internet on the mobile phone, it means that the user can have access all the time to applications, emails and social media which can perfectly replace the SMS for which the user would be charged with an additional cost.

As a consequence, SMS are used just to contact people who don't have smartphones or access to the internet and for informative purposes (online bookings, banks, etc.).

Substitute products are also represented by pure social networks: Facebook, for example, has created two phone applications; the first one is designed to allow users to use the classic social network with all its functionalities, which have been tailored for smartphones; but the other one is just designed to use the private messages. This second application is another substitute product for both SMS and MMS, offering improved functionalities compared to SMS, MMS (an example is the lack of characters limitation).

The mentioned substitute products are taking advantage of the switch in the communications habits, shown by the PEST analysis, for this reason they are acquiring a lot of popularity on the European Telco market: this is a key element which will be taken into account later on, in order to define the actions for the strategy.

6.1.2.4 Bargaining Power of Suppliers

MVNOs need three categories of suppliers to run their business successfully: the energy suppliers; the other Telco operators, which offer some particular routes; and the supplier of the technical equipment needed to install the telecommunications connection and build and maintain the network.

First of all, energy suppliers are generally establishing long term relationships with the operators and, once the agreement is found, the energy supply should be no longer of concern for the Telco enterprises. Anyway, switching costs for Telco operators wouldn't be high and the services offered on the energy supply market are very similar: the price is the main differentiating factor. As a consequence, the bargaining power of energy suppliers is low.

Second, Telco operators need to look for the possibility of using other operators' networks to terminate their traffic somewhere in the world. In this sense, a Telco company can consider the other Telco operators both as competitors but also as suppliers. Generally, the bargaining power is dependent on the size of the supplier: a big Telco operator will generally have both a lot of high quality and convenient routes, which different companies are interesting in using, and a broad network, which means that it has to buy less traffic, form other Telco companies, compared to an operator with a limited network. Therefore, the bargaining power of a particular MVNO depends on the size of the other MVNOs which can be potential suppliers.

Finally, Telco companies make yearly investments on the improvement, upgrading and expansion of their networks: this is done with the help of suppliers, which provide the right equipment, workforce and competences to allow such network improvements.
The products and services required by the Telco operators are quite specific and strategically important for the daily business. Moreover, the switching costs are high, since a supplier can offer slightly different products from another which may compromise the compatibility with the existing network. As a consequence, it is possible to consider that the bargaining power of such suppliers is high.

6.1.2.5 Bargaining Power of Buyers

Telco operators are selling their communication services both on the B2C market and on the B2B market. Starting from such distinction, three types of customers can be identified:

- The end users, who require mobile, fixed phones, data connections and, especially recently, IPTV services.
- The other MVNOs, which buy traffic on somebody else's infrastructures and sell traffic on the infrastructures they own.
- Finally, the enterprises, which need to install ICT applications for their daily business or for special events; therefore, they need both Telco experts and software providers.

Starting from the B2B market, the considerations which have been done for the other Telco operators as suppliers are valid here as well, considering the other Telco operators as buyers. Also in this case, the bargaining power of a particular MVNOs depends on the size of the other MVNOs which can be potential buyer.

Concerning the private enterprises, the bargaining power is low, mainly due to the high switching costs involved and the importance of such services.
Indeed, the Telco services are gaining importance for the daily activities of any enterprise: the right attention should be given to the type of contract which will link the enterprise to the service provider. The fee will be a fixed cost, the quality will be very important and additional services (installation, update and upgrade, maintenance, etc.) are needed by the buyer. Such features negatively affect the bargaining power of buyers and could put this type of buyers in an unfavorable position when dealing with a Telco carrier.

Concerning the B2C market, the bargaining power of buyers is high: mobile and fixed phone users, indeed, have many substitute products for some of the Telco services offered by the operators. Besides, thanks to portability and similar services, they have no switching costs regarding the changing of service plans or Telco operators: this has increased the rivalry among the different operators and has lead to a general conversion to have the same price amounts among the operators of a specific country.
Obviously, a single user cannot bargain with a big company on the price for one of its services. The bargaining power here is *indirect*: it is considered as the easiness with which end users can switch to another operator and select another, more convenient offer. If then a company notices a trend among its existing or new potential customers, who change and select new operators, then it can investigate the market and determine if the price is one of the factors which can explain the trend.

Finally, concerning the internet users, the bargaining power is a little bit lower than mobile and fixed phone users. The majority of internet users have a contract with the internet providers which normally involves the use of a branded router: a change in the internet provider, can lead to some switching costs and to a waiting time for the new connection to be active, depending on the chosen provider. Such features complicate the switch of provider and therefore decrease the bargaining power of the final customers.

6.1.2.6 Conclusion to the Five Forces Analysis

From the identified features for each of the five forces, summarized in the exhibit just below (Exhibit 6.9), it is possible to notice how the competitiveness in the industry is very high.

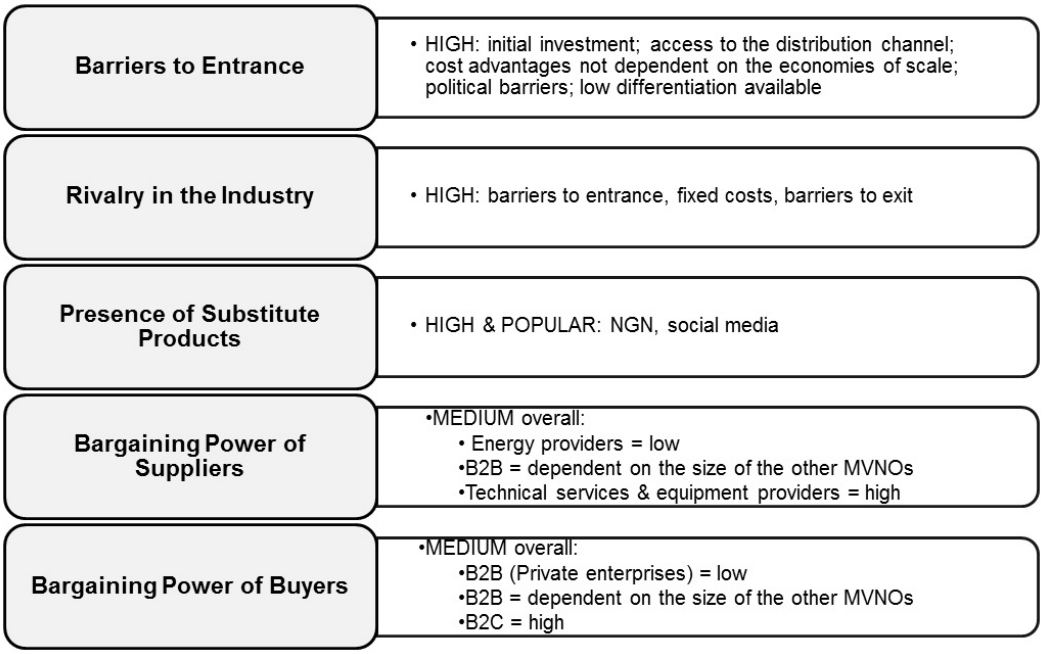


Exhibit 6.9 – Porter's 5 Forces Model applied to the European Telco industry
Source: Author's elaboration

The main reasons which complicate the scenario in which the European Telco enterprises operate are related to the barriers to entrance and the presence of substitute products, which, in the last years, are not just increasing but are also preferred by the customers.

These two forces, plus the external phenomena identified in the PEST analysis, are the direct causes of a high rivalry within the industry.

Finally, considering the different types of suppliers and buyers Telco services operate with, the bargaining power is overall medium and it is not the main reason of such competitiveness within the industry.

6.1.3 Critical Success Factors Identification

The identification of the CSF for the European Telco industry will be performed, analyzing the three dimensions identified by K. Ohmae - known as the 3Cs - separately.

This will be done in the following three sections.

The final output will be a defined list of CSFs identified. This is shown in the following exhibit (Exhibit 6.10).

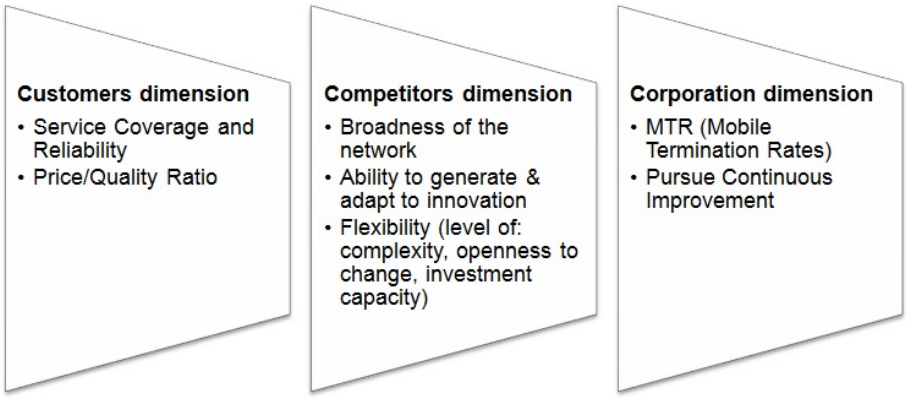


Exhibit 6.10 – European Telco industry CSF
Source: Author's elaboration

6.1.3.1 Customers

The first dimension considered is represented by the customers: in the Telco industry customers are both found on the B2B side and on the B2C side.

Once the customers have been identified and classified in three categories (section 6.1.2.5), customers needs can be analyzed in order to look for related CSFs.

There are some needs which are common across the three groups of customers; these are: the quality of service, the reliability, the coverage of the signal and, finally, the convenience in terms of price.

In particular, the highest importance to the price is given by the end users; on average, due to the demand switch which was described with the PEST analysis, end users are nowadays mostly concern about the price/quality ratio of the data traffic accessible by their mobile handsets.

Concerning the other MVNOs as potential customers, the feature which is valued the most is the quality and broadness of the network. A company which can offer connections to remote destinations with its own network can be very attractive on the market and therefore gain demand, market shares and bargaining power. If a mutual interest is found, relationship between two Telco carriers is established (generally with a bi-lateral agreement), an agreement is found and then traffic is sent.

Finally, considering the enterprises as potential customers on the B2B market, it is relevant to notice that, generally, they give high importance to the reliability and the additional services offered by the

telecommunications services providers: high quality and performances, maintenance and installation are the main factors which are valuable for this type of customers.

Considering the needs identified, service coverage and reliability is a key point in attracting customers, both on the B2B and B2C market. In the Telco industry, high service coverage reliability is determined by the quality and broadness of the physical networks, the ability to define agreements between the company and the rest of Telco carriers, the actual speed of voice and data traffic, etc.
Besides, the price/quality ratio is determinant in such industry, especially as a way to attract other telecommunications carriers and other final customers. The recent introduction of the Eurotariff is affecting the pricing differentiation, which is becoming less and less applicable in the European Telco industry: since the new regulations are fixing very low limits, the operators are pricing their product and services around comparable rates both on the wholesale and on the retail markets.
Therefore, the quality factor is gaining importance in the ratio: Telco carriers which are offered a very good price to send data or voice traffic on a high quality route, will be willing to pay for it, exploiting that route, belonging to a particular operator. Similarly, the final customers may be attracted by the very low prices offered by a reliable brand or operator, backed by a very broad network and a strong presence all over the world. In this way the user will not have to worry when going abroad, because, generally, incumbents and large Telco operators can offer roaming services worldwide.

6.1.3.2 Competition

The second dimension which needs to be considered is the competition.
Nowadays, competition is very high in the European Telco market: the liberalization of the market and the recent introduction of the Eurotariff contributed to increase the level of competition. The CSFs which can be identified for this particular dimension are related to what differentiate one company to the other. The first factor which should be mentioned is, again, the price/quality ratio: quality is very important on the B2B market, while a competitive price with acceptable level of quality is very important on the B2C market.

Moreover, the success on the market is strongly affected by the ownership of a broad network, which can be considered the main asset within the different companies operating in the market.

However, the Telco industry is also affected by the substitute products, offered by the OTTs who don't own a network, in general. The success of the OTTs is due to the technological innovation they were able to exploit: thanks to the low complexity the companies can benefit from (small sizes and financial flexibility), OTTs were able to quickly approach the market with innovative ideas: the ability to generate innovation is another CSF which is determinant in order to defeat the competition.

The trends described in this research show how fast new technologies are introduced in the Telco industry. Companies, therefore, need to be ready to modify their business models and turn these new technologies and new customers' needs into opportunities to increase their market shares and increase their sales. Just with the right level of flexibility and openness to change, companies can be successful.

Flexibility can be considered the last CSF for this dimension: it is intended as level of openness to change, complexity low and of investment capacity (Capex, mergers and acquisitions, etc.).

6.1.3.3 Corporation

Third and finally, additional CSFs can be found by analyzing the corporation dimension. Nowadays, the cost of services sold is determinant for the companies as they need to offer competitive prices and, most of all, limit the consequences of the decreasing revenues which will be inevitable due to the Eurotariff.

The cost of the services sold, in the Telco industry, is generally defined as the MTR (Mobile Termination Rates) which represent the cost of carrying calls, data and text messages on a specific network for a carrier operator.

Second, additional CSFs are related to the ability of upgrading and updating the existing networks: such investments are aimed at pursuing continuous improvement and they represent a form of innovation, allowing the existing infrastructures to be improved and to support new speed requirements and communication technologies. Some of such investments are required by the law, which is imposing more and more constraints over the quality of services; anyway, a part of the investments is required in order to differentiate the offer and survive in the market. The ability to invest in order to pursue continuous improvement is the last CSF identified.

6.1.4 Core Value Adding Activities Identification: Porter's Value Chain

This section is dedicated to the internal analysis of the European Telco industry; after analyzing the existing literature about the topic, this step will be completed with the representation of Porter's Value Chain, specific for the Telco industry. Once identified the key value-adding activities, strengths and weaknesses, for the specific case of Telefónica, will be easier to identify.

Obtaining a general model valid for all the MVNOs operating in the European industry is not an easy task: every enterprise has some particular features which contribute the creation of competitive advantages and differentiate the way of working. However, general processes as well as many similarities have been found among the European MVNOs.

Indeed, the biggest differences found in the Telco industry do not involve the different MVNOs or ex-incumbents operating in each country; they involve the MVNOs respectively to the OTTs.

Similarities among MVNOs and differences between MVNOs and OTTs will be shown through a financial comparison: an understanding of such features is very important, since they can affect the performances in the market.

With the logic described, some enterprises and some financial indicators have been selected.

First of all, the choice of the enterprises to be included in the analysis has been based on the sizes of the operators and the data available. The data has revealed to be an issue regarding the OTTs, mainly: Whatsapp, for example, although one of the most famous OTTs, it is not listed on any stock exchange market; therefore an annual report for such company was not available. Similar problems have been encountered in finding information about Skype: on October 13th, 2011, Microsoft acquired Skype (Microsoft Corporation, 2013) and the balance-sheet of Skype has been merged to the one of Microsoft, making detailed information for Skype only, unavailable. Therefore, little data has been found specific for Skype only.

The enterprises included in the comparison are the following. For the Telco operators: Telefónica, Telecom Italia, Deutsche Telekom, France Telecom; for the OTTs: Google, Facebook, Microsoft Entertainment & Devices Division and Yahoo!.

The mentioned division of Microsoft have been included in the analysis as it is the one in which Skype and Windows Phone are the main sources of revenues (Microsoft Corporation, 2013). Unfortunately, just the data for the revenues of 2012 and 2011 were available for such division and they have been used and considered as a proxy of Skype.

Concerning Yahoo!, it has been included among the OTTs due to its communications services offered such as: Yahoo! Messenger, My Web, Flickr social network, video sharing services, etc.

Second, concerning the financial indicators, the following have been taken into account:

- Revenues: the total value of revenues of the year considered.
- Revenues growth: percentage of growth in revenues compared to the previous year. This parameter shows whether the enterprise is having a positive or negative growth and of which magnitude.
- Capex: the capital expenditure is the amount of investment made by the enterprise, during the year, in order to improve its assets or acquire new ones so that better performances in the operations can be obtained.
- The percentage of Capex over the Revenues is an indicator which gives an idea of the magnitude of the investments made by the company over the year.
- EBITDA: this is the value of Earnings Before Interests, Taxes, Depreciation and Amortization. This indicator is very useful to have an understanding of the financial situation of the

enterprise: it shows just the earnings coming from the daily operations of the enterprise, isolating them from those parameters (taxes, depreciation and amortization) which any enterprise have to deal with and on which enterprises have little influence in the short term; in order to assess how well the operations are working, earnings must be considered before being affected by the non-typical expenses for the business of a specific enterprise.

- Debt Value: it is the book value of total liabilities of the company at the end of the year.
- Equity Value: it is the book value of a company's common stock, surplus and retained earnings (Kotler, 2005).
- Debit over Equity Ratio: by combining Debt and Equity, the indicator obtained shows how much indebted the enterprise is. From the ratio, a general idea about the level of the risk and borrowing power the enterprise has can be obtained. The higher the ratio, the more the enterprise is indebted, therefore, the higher the risk and the lower the purchasing power can be.

Finally, an average for each indicator among the companies of each of the two groups has been computed.

The values obtained are shown in the following tables, for the MVNOs (Table 6.4) and for the OTTs (Table 6.5), respectively.

	Telefónica	Telecom Italia	Deutsche Telekom	France Telecom(*)	Average
Revenues	62.356	29.503	58.200	45.300	48.840
Revenues growth (% previous year)	-0,765%	-1,516%	-0,852%	-0,440%	-0,893%
Capex	9.458	5.196	8.400	5.800	7.214
Capex/Revenues (%)	15,168%	17,612%	14,433%	12,804%	15,004%
EBITDA	21.231	11.645	18.100	15.100	16.519
Debt Value (D)(**)	102.112	40.241	77.399	29.592	62.336
Equity Value (E)(**)	27.661	23.012	30.543	65.451	36.667
D/E	3,692	1,749	2,534	0,452	2,107

(*) The data for France Telecom were available just for the year 2011

(**) D (Debt), E (Equity) are quantified according to the book value

Table 6.4 – Financial Indicators for the Telco Operators. Data for the year 2012, in million of €

Source: Author's elaboration; Data: Deutsche Telekom, 2013; Orange, 2012; Telecom Italia S.p.A., 2013; Telefónica, 2013

	Google	Facebook	Microsoft Entertainment & Devices Division (*)	Yahoo!	Average
Revenues	35.778	3.955	7.455	3.876	12.766
Revenues growth (% previous year)	21,459%	37,133%	7,605%	0,060%	16,564%
Capex	10.146	1.668	-	3.136	4.983
Capex/Revenues (%)	28,359%	42,169%	-	80,910%	50,479%
EBITDA	10.403	384	-	1.320	4.036
Debt Value (D)(**)	11.213	2.602	-	1.941	5.252
Equity Value (E)(**)	45.186	9.135	-	11.350	21.890
D/E	0,248	0,285	-	0,171	0,235

(*) Revenues for Microsoft Entertainment & Devices Division are composed by Skype and Windows Phone
(**) D (Debt), E (Equity) are quantified according to the book value

Table 6.5 – Financial Indicators for the OTTs. Data for the year 2012, in million of €
Source: Author's elaboration; Data: Facebook Inc., 2013; Google Inc., 2013; Microsoft Corporation, 2013; Yahoo! Inc., 2013

The main differences arising from the comparison will be listed below, parameter by parameter.

- Considering the revenues, OTTs result much smaller in size: Google (35,7 billion € revenues in 2012) is the only enterprise which is comparable to the Telco operators (revenues varying from 29,5 billion € to 62,3 billion €). In the year 2012, Google's revenues have even overcome the Telecom Italia's ones (Telecom Italia recorded the lowest revenues among the Telco operators considered). However, this was not true in 2011, when Google's revenues were lower than Telecom Italia's ones. The other OTTs are much smaller than Google: Facebook and Yahoo!'s revenues, for example, are approximately 10 times smaller than Google's ones.
  The same information can be obtained from the EBITDA: the ratio between the average EBITDA for the Telco operators considered and the one for the OTTs can be approximated to 4:1.
- The comparison gives very different results if the revenues growth for the years 2011-2012 is taken into account: on average the Telco operators recorded a negative growth (- 0,89%), while the OTTs recorded a high and positive growth (+16,564%).
- Both the amount of investment made (Capex) and their weight over the revenues in percentage terms are showing that OTTs are investing more in their businesses in order to boost their growth. Although the average absolute values of Capex are different (4,9 billion € for OTTs and 7,2 billion € for Telco operators), they have different impacts on the revenues: the OTTs are dedicating approximately the 50% of their revenues to the Capex while the Telco operators the 15% only.
- Finally, the figures for debt and equity are very useful to compute the debt/equity ratio and compare the two averages. It is possible to see a clear disproportion between the MVNOs'

average ratio (2,1) and the OTTs' one (0,23) which shows how the Telco operators are highly indebted relatively to the OTTs.

The results from such comparison can be summarized in the following way: on the one hand the Telco operators are very big companies, more or less similar among each other; they are benefiting from huge volumes of revenues without generating any growth. Besides, they have to keep investing in new technologies to catch the fast-evolving market and respond to regulatory attacks although having huge debts.
On the other hand, the OTTs are much smaller but they are growing at an impressive pace: despite the fact that their revenues are not huge, they manage to keep a very low level of debts (and therefore financial risk) and a high level of investments, which is making them the leaders of technological innovation.

The exposure to Telefónica's internal processes has allowed understanding that similarities among the MVNOs don't involve just the financial dimension. After having identified the value adding activities within Telefónica, a lot of similarities have been identified thanks to the information available from the other European MVNOs.
This is actually a prerequisite to allow the high level of interoperability and co-operation among MVNOs, required in such business: many differences in the way of working wouldn't be efficient and would hamper the agreements.
Telefónica Global Solution's value chain will be presented and used as a proxy for the general European MVNOs.

In the following parts of this section, core activities (sections from 6.1.4.1 to 6.1.4.5) and support activities (section 6.1.4.6) will be described in detail.

Among the primary activities within Telefónica Global Solution, it is possible to find: products and services development; marketing; customer and supplier management; offer definition; service delivery and reception.
Moving to the support activities, the following ones have been identified: information systems; human resources; finance; customers and agreement follow up; strategic definition.
The activities just listed will be shown in the following exhibit (6.11) and then described below in detail.

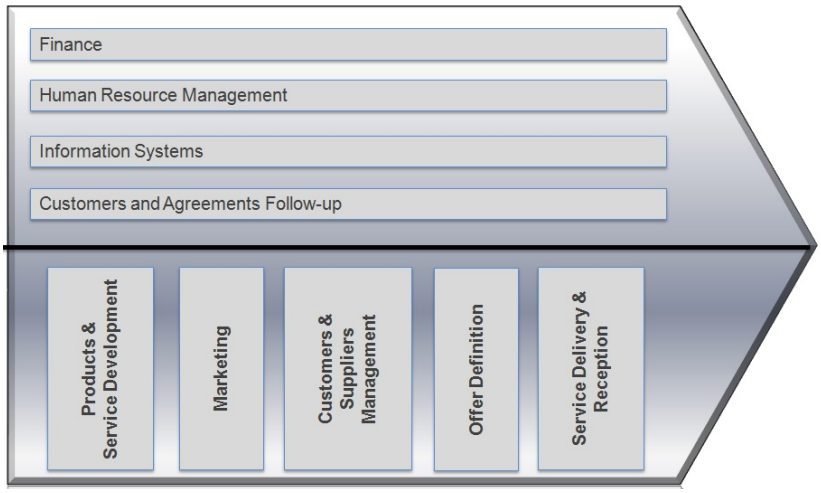


Exhibit 6.11 – Porter's Value Chain Model Applied to Telefónica Global Solutions
Source: Author's elaboration

6.1.4.1 Product & Service Development

Concerning the primary activities, first of all, the *products and service development* is the activity designed to monitor, define, develop and study the improvement possibilities of the range of products and services offered by the unit.

These consist mainly in selling the use of the owned network to other Telco operators, or in selling a bundle of services for the organization of a particular event (sport events, etc.).

The results coming from the financial comparison (included in the introduction to section 6.1.4) clearly show how high investments in this industry are necessary to fight against the competition, the substitute products and in order to enable the process of continuous improvement in terms of speed, coverage and reliability over the network.

Although such services are not subjected to frequent radical innovations, the mentioned investments are necessary to improve the existing structure.

The activities performed are related to the screening for market opportunities and to the definition of projects and investments.

6.1.4.2 Marketing

The *marketing* is the activity which defines the *product*, *price*, *place* and *promotion* of the products and services sold, from a marketing point of view: the focus is oriented to the customers and to the business environment (Kotler, 2005).

First of all, MVNOs offer comparable products on the market, differentiated just by price and quality. These have been presented already in chapter 3 and in the service development phase description.

Concerning the *pricing* strategy, different possibilities can be implemented according to the type of customer, which must be targeted in different ways.

Besides, the pricing strategy acquires importance since the services offered are constantly changing of price due to a lot of different factors: the cost of energy, the change rate between euros and American dollars, the changes in the price of other Telco companies, etc.

On the B2B side, the services sold to other enterprise are mainly valued for their quality, rather than the price; therefore, the pricing strategy doesn't seem the main concern for this kind of sales. Besides, each project is more or less unique and therefore there is not a simple list of services that can be purchased and generally priced. ICT solutions for enterprises are usually designed ad-hoc.

Remaining on the B2B side, but considering the other MVNOs, the pricing strategy adopted is the mark-up. The costs of forwarding a call are defined, in the Telco industry, MTR (mobile termination rates): operators price the use of their network per minute and the exact prices are obtained by adding a desired margin to the MTR cost they have. Due to the high competition, margins are kept low and a lot of special prices (discounts) are offered.

Concerning the B2C market, instead, the pricing strategy is particularly significant in terms of results on the market.

MVNOs are pricing their services in three different ways (Bachelet, 2013), which will be presented in the following list:

- Truly unlimited: companies are charging a fixed fee to the end users and offer them unlimited data at the maximum available speeds.

  Telco operators offer different packages of truly unlimited services, at different prices, according to the maximum speeds reachable.
- Capped or throttled unlimited: companies are charging a fixed fee to the end users offering them a limited amount of data at the maximum available speed, followed by unlimited amount of data at a different, reduced, speed.

  The price is different according to the packages which offer the possibility to exchange more data at the maximum available speed.
- Openly advertised data allowance: the data included in the fee are limited from the beginning and they are exchanged at the maximum speed available. The services offered are different according to the amount of data included in the offer.

In the Telco business, on the B2B market, the *place* consists in the different routes and terminations offered by and to the other different Telco companies which the unit is operating with. Besides, the same infrastructures and communication routes are the distribution channel which can provide the communication services to the final users, on the B2C market. The place depends on the network available: in particular, its capacity, quality, connection speed, etc. these parameters are not directly

affected by the unit of analysis; they are indirectly set when customers, agreements and offers are defined (typically, agreements last for a time frame which can vary from 1-week time to six-months).

Promotion is defined as the way products and services are presented and communicated to the customers (Kotler, 2005). The promotion mix definition is part of the marketing strategy of any enterprise and consists in assessing the ways products and services should be presented on the market. A company can choose to use any of the following possibilities: advertising, personal selling, sales promotion, public relations and direct marketing (Kotler, 2005).

- Advertising is any paid form of non-personal presentation of ideas, goods or services.
- Personal selling is the action made by the company's physical sales force.
- The sales promotion consists in a short-term incentive to encourage the purchase of a product or service.
- The public relations are all the actions aimed at building good relations with the company's publics.
- The direct marketing, finally, is the direct connection established with a carefully targeted group of individuals in order to obtain immediate response and try to build long-term relationships.

A specific way to present the products and services implies a different perception for the final customer; therefore, the promotion is a crucial dimension which needs to be defined. Any of the described methods should be exploited by the company; a particular focus is given to the advertising and the sales promotion.

Concerning the advertising, it is important to distinguish between the two main groups of customers, the ones on the B2C market and the ones on the B2B market.

Anyway, there are common features to manage the two groups: customers, nowadays, are giving importance to the true value which is offered for the money they are asked to pay. In such context, it is very important to present products and services with true and precise advertising messages, which clearly show what is included in the products or services sold and which are not aimed at just being attractive for the customers. Information and details about prices, traffic speed and specifications should be easily accessible to any customer and in any of the channels described above.

This marketing approach is designed to strengthen the image related to reliability and trust.

On the B2C market, promotion is aimed at being precise and attractive for the end users.

On the B2B market, too many details can compromise the business: MVNOs should advertise and promote their services and performances offered; however, clearly showing the other operators' routes and infrastructures used for a particular connection, could be harmful, since the customers may think about buying that particular connection straight from the infrastructure owner in the future. Indeed, each operator who re-sells a connection, add a margin over it (as explained in the pricing part

of this section): if that connection is flowing over a not-owned network, than the costs advantages are lost and the final prices for the customers are increased.

6.1.4.3 Customer and Supplier Management

The relationship with customers and suppliers are a key asset for the MVNOs, a specific phase, *customer and supplier management*, is designed to keep such relationships and create new ones.

The presentation of the different categories of customers MVNOs, including Telefónica, sell services has been included in section 6.1.2.5.

In particular, Telefónica Global Solutions sells just to the other Telco operators or to specific enterprises, remaining, in both cases, on the B2B side of the market. On the other hand, concerning the suppliers, the business unit receives support just from other Telco operators who sell traffic to the enterprise.

Therefore, the management of the relationships with customers and suppliers consists in the definition of agreements, SWAPS, offers, committed volumes, prices, etc.

Normally, semiannual bi-lateral agreements are signed with customers and suppliers: every half a year, such agreements have to be confirmed or modified and then signed again. The definition of agreements is a long and demanding phase of the process but it is very important in order to link customers or suppliers for the agreed months, guaranteeing a secure cash flow for the future and contributing to the add value to the whole process.

6.1.4.4 Offer Definition

Each offer has to be defined and sent to the customers: before this is successfully done, part of the phase is dedicated to the *offer definition*. Some traffic volumes are generally committed and such amount depends on the special price offered by the involved operators. This is usually the main issue which is discussed also internally within the unit, since the special prices have to be approved by managers belonging to different teams.

Besides, if an agreement is involved, then it needs to be signed by different managers too. The same should be done on the other side, by the other Telco operators involved.

This activity is basically bureaucratic but it is determinant in order to confirm the different agreements, facilitate the computations of costs and expenses and make the new agreement or offer official and visible to the other units of the enterprise. Only after all the details have been formalized, then the support units can contribute and import the offers on the information systems.

6.1.4.5 Service Delivery and Reception

The *service delivery and reception* is the activity which allows the traffic to be successfully exchanged over the network.

By definition, this is a key activity as it enables the actual business activity: the payment of the minutes exchanged over a network is not done upfront but just once the traffic has been success fully reached the destination.

This is also the main activity which can be considered as the operations of the company.

Coherently with the research purposes (chapter 4), this part will be dedicated to present some technical aspects of the Telco services described in this paper; this is not a technical thesis, therefore the purpose of this section is not offering an exhaustive explanation of how Telco services work and are delivered to the client.

In particular, this section will point out how the VoIP works, compared to the normal voice data exchange (over the PSTN (public switched telephone network)). Thanks to the technical introduction of the first part, it will then be possible to understand why the VoIP can be more convenient than the use of PSTN to exchange voice data. Finally, some drawbacks of the VoIP will be pointed out.

First of all, NGN (Next Generation Technologies) and VoIP are almost synonyms: NGN is used to address a broader concept, indicating any content (video, audio, voice, text, and image) sent and received over the internet. VoIP, instead, is used to address just the voice traffic, sent and received over the internet. The operators offering NGN services are also called OTTs (Over The Top) and the main OTTs are: Skype, Google, WhatsApp and even Facebook.

The term which will be used in this section is VoIP only, since the technology which will be explained is especially designed for the voice traffic.

6.1.4.5.1 The PSTN - Public Switched Telephone Network

The traditional phone system – the first which has ever been created and the one people have been used to for generations – is called PSTN (public switched telephone network) and, nowadays, phones are using more or less the same technology since its invention.

The invention of the phone is a delicate topic, with many controversial opinions. This is not meant to be the main topic of the section, therefore, in this research, the inventor of the phone is assumed to be A.G. Bell, who patented his invention in 1876 (Doherty, Anderson, 2006).

The baseline concept behind the telephone is that the voice, in the form of analog waves of sound, can be transferred over a copper wire with a stream of voltage changes. This generates an electric signal which can excite a speaker and reproduce exactly what the other person is saying from the *other side*.

At first, the networks of wires were able to connect different phones within the same geographical area: telephone numbers were not born yet, therefore people had to call each other by communicating to the operators – who were working in central offices – the name of the person they wanted to call and talk with.
The operators were in charge of connecting the two sides of the call, working on switchboards, devices which allowed the connection among group of phones.
The connection was executed manually, at first, and consisted in creating the contact between the circuits of the caller and the one of the receiver, through a wire. The PSTN connection was therefore consisting in a connection between two points over a circuit which is reserved and lasts for the whole duration of the call.

AT&T Bell Labs introduced the numbering system in telecommunications: by assigning a unique number to a phone destination, switchboards could immediately understand the destination a person wanted to call and establish the contact by themselves. The operation could then be performed automatically by replacing the simple switchboards with more powerful computers.
The network which allowed the connection among the phones was composed by physical centers which hosted the devices necessary to make the calls possible. These offices were organized in different categories, containing different hardware which allowed reaching a further destination. According to the distance between the origin and the destination of the call, different hardware were needed and therefore different categories of offices were reached and involved in the call. The different categories of hardware will be presented:

- First of all, phones within the same geographic location were connected by central offices – physical offices where the switches were stored. A complex system of wires – called trunks – were able to carry different calls at the same time, connected the switches.
- Second, the calls to further central offices were forwarded to toll centers, in which toll switches were stored. These devices, similar to simple switches, were able to connect central offices located more far away.
- Third, in the case of calls to another geographical area, the call was passed from the central office to the toll centre and ten from the toll centre to an upper-level office, called regional centre, which was able to forward the call to the toll centre located in the other geographical area. Finally, the local toll centre reached the local central office and the handset of destination.
- Further destinations were reached with the same logic: a total of 5 levels of offices and switches (two levels more than the one described above) were needed.

The network described underwent some changes in order to improve performances and to adapt to the introduction of mobile phones and internet.

First of all, mobile phones were introduced on the market in 1982 and they went digital in 1995 (Doherty, Anderson, 2006). The wireless phone system which was built, was designed to perfectly integrate with the phone system existing, in order to allow the communication between the two categories of devices. For such reason, additional hardware was needed: on the one hand to allow such integration and on the other hand to allow the digital signal to be sent from origin to destination.

Service Switching Points or Mobile Switching Centers were connected to gateways - devices introduced to translate the data from one protocol to the other, when needed.
Concerning the digital signal, first, it was sent through a Service Control Point (SCP), a device in charge of enabling the routing of the call: the SCP's function was querying a database – called Service Data Point (SDP) – containing all the numbers and the corresponding geographical location. The digital signals could then be routed towards the geographic area of destination.

To sum up, in order to properly describe the way any telephone service works, 4 elements must be defined. First of all, how the signaling works (the communication between the handset and the phone service, necessary to let the system understand that a call wants to be placed).
Second, the conversion, i.e. the transmission of the actual data over the network.
Third, the features which are allowed or supported by the service, such as: voicemail, call waiting, etc.
Fourth, the power needed by the handset in order to work: it can be taken from an external source (such as the electricity of the apartment throughout a dedicated wire) or from the same wires which are used to place the call.

6.1.4.5.2 The Origins of VoIP

VoIP enables voice communications over networks based on the IP (Internet Protocol).
Such technology became available in 1995 with the introduction of an Internet phone software by Vocaltec, Inc (Doherty, Anderson, 2006).
Since then, VoIP software and hardware improved and became more and more popular, allowing much more functionalities such as the communication between VoIP and PSTN and vice-versa.
Concerning the software, the most successful story is without any doubt represented by Skype, the "*leading internet communications company*" (Skype, 2013) which was founded in 2003 and headquartered in Luxembourg (Skype, 2013).
Nowadays, Skype belongs to Microsoft thanks to the 2011 acquisition for $8.6 billion from the previous owner – the Silver Lake group (Microsoft Corporation, 2013).
In 2010, Skype reached 170 million connected users and nowadays, at peak-time, Skype claims to reach 40 million users online.
VoIP represents a big phenomenon which is worth describing even in technical terms.

6.1.4.5.3 How VoIP works

The aim of this section is to explain the technology which is used to send voice data over the IP.
The IP, Internet protocol, is a term which is used to address several topics: it can mean literally the internet protocol, which is the set of standards established in order to send data over the internet; or it can also refer to the IP address: in order to reach a device over the internet, an address (consisting in a series of numbers) is assigned to it.
However, the main use of the IP term throughout the thesis is the internet networks and traffic in general. Indeed, voice-over-IP literally means sending voice data over the internet – a network which works according to the IP protocol.
To describe how VoIP works, the following paragraphs will be dedicated to the presentation of the different technologies and hardware used when a VoIP call is made.

First of all, VoIP traffic is exchanged with the packet switching technology.
This can be described in the following way: first, the voice data which the network is required to send to the destination are broken into different smaller pieces called packets. Second, each packet is sent to the destination throughout an independent route or channel, which can be different from the one another packet will follow.
Finally, once at destination, the different packets are re-assembled together and the receiver can properly understand the communication.
The packet switching technology offers some advantages compared to the PSTN, enabling a more efficient exploitation of the network: these will be described in the pros & cons section (section 6.1.4.5.4).

Second, another technology must be adopted to overcome a problem caused by the conversion of the voice data.
The voice data is in the form of a continuous-time analog wave; such format cannot be sent over the internet, it must be converted in a compatible format.
The data flowing on the internet are all discrete-time signals, made of sequences of 0s and 1s: a continuous-time signal, such as voice waves, cannot be sent over the internet.
The technique which is used to convert the analog voice into the digital format is called sampling.
Sampling requires that first the voice is translated into voltage signals and then converted into the digital format. Sampling can be defined as (Wescott, 2010 - page 1):

"(...) the process by which continuous-time signals, such as voltages of water levels or altitudes, are turned into discrete-time signals (...)"

The waves of voice signal are therefore measured thousands of times per second and, for every measurement - or sample - a combination of 0s and 1s is created and then sent to the destination - with the method just described above.
By applying the inverse procedure, the handset of destination is able to reproduce the voice in the original analog format.
The conversion can be a problematic phase during a VoIP call: the topics will be explained more in detail in a dedicate section of the appendix (section D).

Finally, the hardware used to make a VoIP call possible is different than the one used for a normal PSTN-PSTN call. In order to successfully show how VoIP works, this section will use a step-by-step approach: starting from the PSTN-to-PSTN call scheme – which is taken as a reference, the VoIP will be introduced. First, the way a generic VoIP-to-PSTN call works will be described and, finally, all the elements will be provided in order to understand the way a complete VoIP (VoIP-to-VoIP) call works.
The following image (Exhibit 6.12) shows the scheme of a PSTN-to-PSTN call. The way a PSTN call works has been already described (section 6.1.4.5.1): in order to simplify the presentation, the scheme (Exhibit 6.12) shows just one level of offices, the central office.

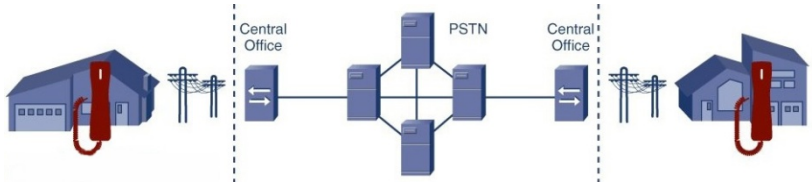


Exhibit 6.12 – PSTN-to-PSTN Call
Source: Doherty, Anderson, 2006 - Chapter 2

In case of a VoIP to PSTN call, first of all, the conversion from the analog voice to the digital internet format is needed. This function is performed by the terminal adapter – connected to the handset.
The terminal adapter is also directly linked to the internet and it generally performs other functions, such as sending the dial tone to the VoIP handset and establish the connection to the softswitch, another useful hardware component.
The second step is performed by the softswitch that has the function of routing the call: the softswitch is reached by the terminal adapter via the internet and therefore can be placed anywhere. This is a very convenient feature and represents a way to overcome the limitation of the PSTN-PSTN case, in which the softswitch needs to be placed at wire-distance from the handset.
Third, the softswitch will route the communication on the PSTN infrastructures which will allow the signal to reach the destination. Finally, the communication will be received in the same way seen in the reference case (PSTN-to-PSTN).

The following image (Exhibit 6.13) shows the scheme of the VoIP-to-PSTN call just described:

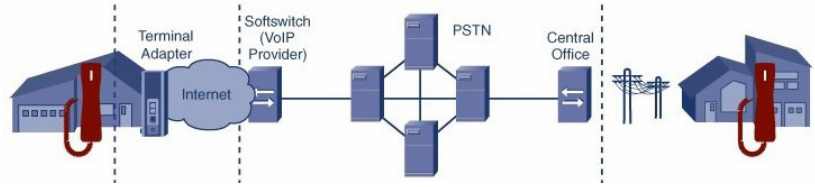


Exhibit 6.13 – VoIP-to-PSTN Call
Source: Doherty, Anderson, 2006 - Chapter 2

Finally, in the case of a VoIP to VoIP call, the connection between the origin and the destination is totally over the internet: the first part will be the same as in the case just described (VoIP-PSTN call): the VoIP handset, the terminal adapter and the softswitch will forward the call over the internet. Then, differently from the case just described above, the second part of the call is symmetric to the first part: from the internet, the different packages will reach the softswitch of destination and then will be sent to the terminal adapter which will convert the digital data back in analog voice.
The following image (Exhibit 6.14) shows the scheme of the VoIP-to-VoIP call just described:

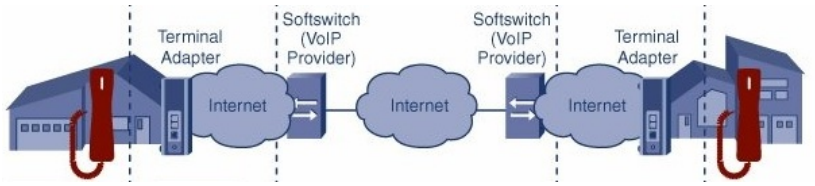


Exhibit 6.14 – VoIP-to-VoIP Call
Source: Doherty, Anderson, 2006 - Chapter 2

6.1.4.5.4 VoIP: The Pros & Cons

VoIP offers more advantages than disadvantages, compared to the PSTN technology. These will be described in the following paragraph.

The advantages offered are mostly of financial nature:

- First of all, VoIP offers infrastructure-costs advantages: while PSTN has costs for offices, switches, lines, wires which must be installed and then upgraded and maintained on a yearly basis, VoIP doesn't require dedicated infrastructures. Except for some gateways, which are needed to allow the translation between VoIP and PSTN signals, VoIP can fully exploit the already existing internet infrastructures, making the already existing PSTN infrastructures futile.
- Second, even the variable cost of a call is lower in the case of VoIP calls rather than PSTN ones: between two VoIP phones, a call would be totally free, while between VoIP and PSTN, the cost would not be zero.

However, when talking about internet, geographical distance is not a problem any longer: with the same variable cost it is possible to reach a close or a very far destination. The critical parameter when talking about the internet is represented by the capacity of the network. This may be an issue if a video call is needed, otherwise a normal internet connections is able support a simple voice call without much complications.

- Third, VoIP is still considered as data traffic: thanks to such property, VoIP can benefit from a lower amount of regulations, taxes and fees compared to the voice traffic and business. This represents a big advantage for operators that can lower costs just because the VoIP business is less regulated: however this advantage might be no longer valid in the future.
- Forth, an advantage is represented by the packet switching technology: compared to the PSTN, the packet switching technology is able to exploit the network in a more efficient way. The fact that packets are flowing over the internet independently, allows the network to handle multiple calls or connections at the same time: the information is sent over the IP network just when needed, allowing the same network to be exploited for other data flow. The PSTN, instead, is designed to reserve the network between origin and destination just to the call which is going on between the two points.
- Fifth, a big practical advantage for the users is represented by the functionalities offered by the VoIP phones. Each of them must have both a unique IP address and a primary phone number. Besides, such phones offer the possibility to link as many virtual telephone numbers as wanted. This is a very convenient feature: for example, an American VoIP phone can have an Australian telephone number linked to it. Therefore, an Australian person who wants to make a PSTN-to-VoIP call to his or her American friend, can call the Australian phone number linked to the American's VoIP phone and call to the other side of the world at a national cost.
- Finally, if we consider internet to be ubiquitous, then an IP phone can be used anywhere. This represents a great advantage: it would allow users to bring just their *fixed* phone anywhere they go, being able to be always reached with the same number.

Concerning the disadvantages, they are mainly related to the reliability offered by the VoIP compared to the PSTN: this can be affected by few parameters in the case of PSTN, while much more parameters in the case of VoIP.

Concerning the PSTN, the quality is simply affected by the distance of the call, and by the quality of the infrastructures (basically the wires and the devices which were described when presenting the network).

On the other hand, concerning VoIP, the quality of a call is affected by:

- The bandwidth, which is defined as (Oxford University Press, 2008):

"(…) the transmission capacity of a computer network or other telecommunication system (…)"

Normally, by default, the uplink traffic capacity (the flow from a user's router to the internet) is lower than the downlink one (the flow from the internet to the user's router): therefore, the uplink capacity is the most important parameter to take into account when considering the quality of VoIP calls. This is affected by the number of computers or users connected to the same internet and the capacity dealt with the internet operator.

- The delay: the time needed for the packets to reach the destination from the origin. Packets are given a limited amount of time to reach destination: they may not reach the destination at the same time and, if some of them require more than this time, they may expire and affect the quality. With a slow network the communication would result delayed and some information can be even lost (as described just below).
- The loss: the amount of packages which cannot make it till the destination affects the quality of the call. This can be noticed by missing voice data, such as syllables or even words.

The reliability of the VoIP is also affected by the dependence on the electric power: while there are PSTN phones which work thanks to the power coming from the same wires used to transmit voice traffic, this cannot be the case for VoIP phones. Indeed, they require a dedicated wire plugged in a source of energy: if there is no energy, then the phone doesn't work.
Nowadays this disadvantage is valid also for the most used PSTN phones, due to the diffusion of cordless phones, which also depend on an external source of power.

Another category of disadvantages is represented by the security: likewise any data flowing over the internet, VoIP is affected by security threats too. The main sources of problems, in the case of VoIP data, are represented by:

- DDoS attack: the goal is making a network unavailable to its users. The attacking methodology which is generally used consists in sending packets of data to the targeted network from multiple external sources. The packets of data contain requests of exploiting the network. In this way, the network will result overloaded of requests and will be very slowed down trying to answer to any of the requests. The result would be having a network which works so slowly that it cannot work properly. This can happen also to a VoIP network.
- Data-sniffing: interception of packets which are flowing over a network and whose content is read by a third user, different from the sender or the receiver of this information.

Finally, the VoIP has an additional limitation: the majority of internet phones don't support tools such as fax lines or other analog services. These features may be included in the future, in case of diffusion of VoIP technology.

6.1.4.6 The Support Activities

The core process just described involves a lot of data, information and a high level of complexity, which requires additional help and support activities.
MVNOs have designed their own support activities to deal with such complexity: there are quite specific for each company. In general, *information systems* are very much used: the Telefónica information systems and support activities will be described in this section.

Within the company, the platforms which are used are a lot: there are different software, databases and corporate social media.
Among the software, different applications are designed to: control the finance, monitor the inbound and outbound traffic flowing over the corporate infrastructures, generate offers, record the prices, formalize the offers and allow the invoices generation.
Second, a corporate social media is used to show the relations among employees, in particular concerning the business opportunities which have been generated, allowing having a clear picture of responsibilities and people involved in a specific deal with a certain customer.
Third, different databases can be queried in order to analyze data and get information about customers, agreements, finance and traffic exchanged.
In addition, a platform which keeps all the reports, surveys and analysis required by the company to external consultancy firms is available.
Finally, the information systems team is also responsible for the telecommunication connections within the company. This includes the management for the phone lines (which exploits a VoIP connection within the company), intranet and the internet connection.

Second, the *human resources* team is responsible for the personnel working in the unit: any need of additional workforce has to be analyzed and solved by the human resources.
The results achieved also by this unit have were impressive, especially in the 2012-2013 period as the business unit has been awarded as one of the best workplaces, entering in the top-25 international list (Great Place to Work®, 2013). The Human Resources had the particular merit to create a great place where to work thanks to the original initiatives and programs which stimulated the employees and facilitated them to feel part of the same group.

Third, the *finance* is related to the process and follow-up of invoices, pending payments and the management of all the assets, debts, etc.
The decisions taken by the finance team are strategic and their impact is sometimes directly visible in the company's balance sheet.

There is a direct relation between this unit and the core activities of the process described: whenever there is an invoice or a payment to be done, the financial team is taking care of it - the input is received automatically, throughout the information systems.

Fourth and finally, the *customers and agreements follow-up* is a team dedicated to monitor the traffic and the relations with the customers. Starting from all the information and details about a customer, the agreements, the defined prices and the committed traffic, the team is making sure that the real traffic sent or received, the prices paid match with the information contained in the agreements and offers accepted.
In case of problems or mismatch, the team is responsible to report to the managers responsible for a customer area or, in some cases, to directly solve the issue by contacting the customers involved.
This is the general process followed to accomplish the daily activities inside Telefónica Global Solution: some activities have been simplified, due to the many exceptions which could occur. This is also the end of the second part of the case study.

6.2 The Telefónica Case Study - Part III: The Consequences on the Strategy

The third part of the case study consists in analyzing the findings obtained mainly from the studies developed over the Telco industry. The output of the analysis is a SWOT matrix, specific for the case of Telefónica Global Solutions.
This step is very important and will affect the future parts of the research, since there is a very strong link between the SWOT matrix and the strategic actions which could be recommended.

The next sections will be dedicated to the specific analysis of each dimension of the SWOT analysis: the results coming from the application of the model are shown with the following exhibit (Exhibit 6.15):

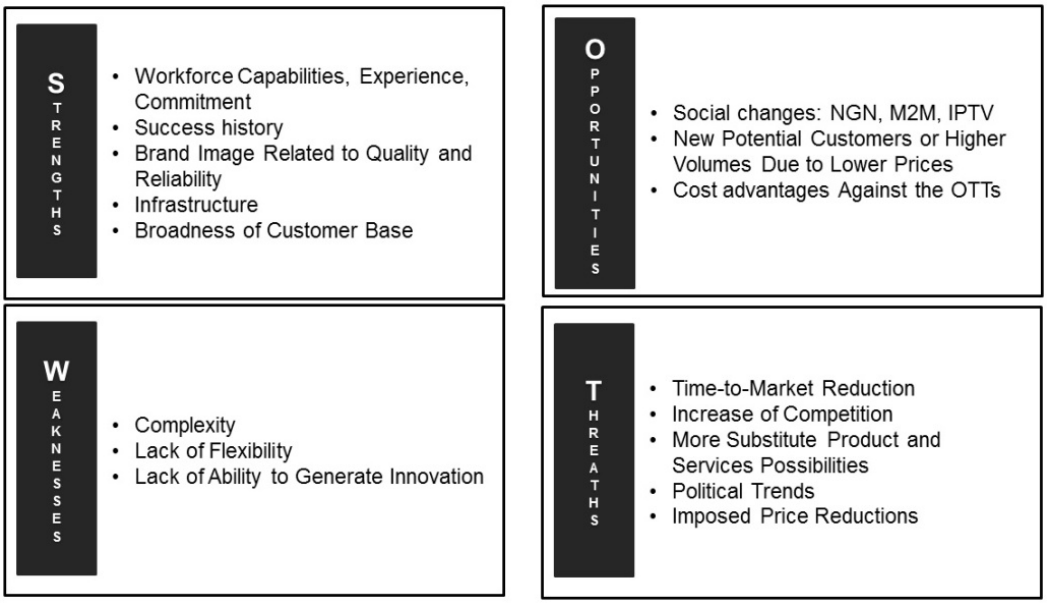


Exhibit 6.15 – The SWOT Analysis Applied to Telefónica Global Solutions
Source: Author's elaboration

6.2.1 Strengths

After being exposed to the corporate culture, values and methodology within Telefónica Global Solutions, it is possible to determine which are the most relevant assets which definitely represent a strength for the group and the business unit in particular: the workforce experience, competences and motivation; the success history; the infrastructure quality and coverage, which is offered to the customers; the broadness of the customer base; the brand image, mostly related to the quality and reliability of products and services.
For each of the strengths listed, a paragraph will be dedicated in order to further describe and define them properly.

First of all, the workforce the group can rely on has quite impressive capabilities: the average level of competences, commitment and experience is very high and the Global Solutions business unit has even been awarded, in 2012, for its workplace conditions (Great Place to Work®, 2013). Working conditions are very flexible and people-oriented: the result was that the business unit has become an ambitious place where to be and work, allowing the company to hire the best-of-breed workforce, making long-term investments and ensuring a future workforce with comparable – or even better – profiles, compared to the ones already working in the company.
Moreover, all the initiatives such as awards, recognitions, trainings, seminars and original events opened to everyone, independently from the level or the position, have contributed to establish strong relationships within the business unit also on the personal dimension: people have become more than simple colleagues and little room has been left for competition, disagreements and pressure.

Every aspect – from the division of work to the physical distribution of the people in the office – has been taken into account in order to stimulate the interaction, mutual help and team-work even with people who are temporarily abroad or cannot contribute with their physical presence in the office.
Finally, people belonging to different backgrounds, cultures, countries and hierarchical levels or with different experience are put on the same level and treated exactly like any other employee; everybody has the impression that the company cares about its people and all of this has enabled teamwork and mutual respect.

The success history of the group is seen as something which everybody should be proud of and it is also seen as an input to keep a high level of motivation and performances.
This has also helped building a very strong brand image and reputation, both on the B2C, B2B markets and among the potential workforce and future employees.
This strength is not creating any pressures on the employees; neither the past successes are making people lazy or too confident. The success history is really affecting everyday tasks since employees are optimistic, aware of being backed by a very huge corporation and motivated to keep the results high.

Two additional attributes which are normally linked to the different brands the enterprise is known with are *quality* and *reliability*.
In order to gain this image, the company has obtained great results on the market during its long history and nowadays, it is able to offer great services to its customers.
This is particularly true on the B2B side of the market, where operators particularly care about the quality and level of service achievable: the quality is more visible on this market because companies generally trade amounts of minutes on a specific route, with determinant and quantifiable quality parameters.
On the other hand, on the B2C side of the market, the level of quality is more comparable among the different competitors and less visible to the final users; besides, when customers are making international calls or when roaming from abroad, the networks exploited can belong to other operators, different from the one selected when choosing the mobile phone services in the home-country. Therefore, the quality of the service is determined by the other MVNOs too.
Despite the facts mentioned, anyway, the company is still perceived as one of the top-quality alternatives among the different Telco services providers, in all the home countries where Telefónica is present.

Forth, the infrastructures which the company owns and uses represent another strong point for Telefónica Global Solutions and for the group as a whole.

The main attributes which are making the infrastructure a strength are: the broadness, intended as the coverage in terms of countries and kilometers of interconnections and the level of quality and reliability, which is possible to achieve.
Thanks to its network, Telefónica can benefit from cost advantages: while the other operators need to outsource the flow of data and use somebody else's networks, Telefónica is avoiding such expenses while making a margin over the use of its network, by selling it to the other MVNOs on the B2B market.
A confirmation of the broadness of the network is also offered by the *label* of Tier 1.

Finally, the last of the strengths identified is represented by the broadness of customer base. Telefónica underwent both a geographical expansion and a customer base expansion in the last years. Thanks to these moves, it has assured a high volume of revenues coming from long-terms relationships with customers from all over the world. Nowadays the company can benefit from agreements and relationships with customers coming from literally any corner of the world: in the organizational chart of the sales are of Telefónica Global Solutions there are entire business unites dedicated to specific geographical locations (EMEA, Europe Middle-East and Africa and AMEP, America and Pacific). The managers operating in such units are dedicated to keep the relationships with the customers from a specific area. Such a broad customer-base can guarantee a very high risk diversification, allowing the company to survive from local crisis or to quickly exploit local opportunities abroad.

6.2.2 Weaknesses

The weaknesses found within Telefónica Global Solutions are mainly related to the size of the group the business unit is part of. These are: complexity, lack of flexibility and lack of capability in generating innovation.

First of all, the corporate structure and the business present a high level of complexity. This is true concerning different areas; for example: finance, information systems, procedures and communication. The most evident example of complexity within Telefónica Global Solutions is represented by the information system: the group has many different platforms and software which are all needed to complete everyday tasks and generate documents required by customers, colleagues and procedures.
However, there is a lack of a single unified platform which could enable to keep all the different systems under the same *umbrella* allowing the optimization of the data storage, the use of a general single database and the full compatibility and interaction with each other.
In the current situation, the company manages to successfully complete any task requiring an information system but this is not done in the most efficient way.

Despite the fact that Telefónica has access to an ERP (Enterprise Resource Planning), full integration under the same software has not been achieved and the enterprise has got used to work with smaller software, besides the ERP.

The main reason why companies have been introducing expensive software such as ERPs consists in having the opportunity to benefit from all the applications available as modules of the same software: this is a much more efficient solution than having different software with dedicated data. With a single software, the system could share the same database among the different modules.

Theoretically, the ERP is also conceived to optimize generation of outputs, which are supposedly compatible with any module and could be more easily adapted to what the users need; however, Telefónica doesn't seem to exploit the full potential offered by such tool: the company is using a lot of different software, each of them specialized on a specific phases of the business processes.

The different software work in an independent way, taking the data from different databases and generating outputs with different formats and structures. Once such files need to be modified or merged, compatibility problems arise: working with different files is not simple and requires a way to make the different files compatible.

This is why such software still needs to be all interconnected. However, this is not possible in a direct way: other applications and even smaller software are needed to allow such interconnection.

The described structure is what is called a typical *spaghetti integration* structure: a heterogeneous point-to-point integration. Such configuration is obviously a synonym of low efficiency and high complexity due to the need of managing different systems, different upgrades and different providers, etc.

The consequence is also a general need of more time to complete tasks which could have been completed much more efficiently, if supported by an optimized set of information systems. As a result, the overall company's productivity is negatively affected by the lack of information systems integration.

Another area which is affected by the complexity is the finance, as described in the financial performances previously commented (section 6.1.4.3). The huge size of the group, the high number of procedures and the complex corporate structure are affecting the flexibility from a financial point of view. Besides, the fast-changing environment requires the companies operating in the Telco industry to keep a high level of investments and a high level of attention to the market, where a low of small enterprises are emerging and are easily bought by bigger OTTs. However, taking fast decisions results almost impossible due both to the complexity described and to the high level of debts reached by the MVNOs, including Telefónica.

Second, the lack of flexibility is also strongly linked to the size of the group the business unit is part of: the procedures, bureaucracy and the numbers of hierarchical levels are the main cause of low flexibility. Any critical decision, change or problem needs to be reported to the right people who are

not even easy to identify. The existing corporate social media, which was described among the other information systems included, is a helpful tool in order to allow the traceability of the decisions taken and the relationships with the customers but, anyway, the processes are slowed due to the amount of people, rules, exceptions and the degree of complexity included in the procedures.

Third, another issue the big MVNOs are facing is represented by the strong innovation which OTTs are bringing to the Telco industry. When generating innovations, MVNOs have been linked to their business models, which have been extremely successful in the last years, bringing no radical innovation on the market. The most recent innovations and changes created by the MVNOs have been related to upgrades or improved technological solutions to provide the existing services.
OTTs, on the contrary, have found the way to satisfy the demand for the same services in other ways, contributing to innovate the market and increasing the convenience for the end users. The consequence has been that OTTs are now associated to the image of innovation and innovative solutions; MVNOs, on the other hand, have lost competence and creativity related to innovation: the last weakness which has been identified is therefore the lack of ability to generate innovation.

6.2.3 Opportunities

The analysis of the strategic environment and the market in which the company is operating have offered different hints about possible exploitable opportunities.
The one identified in the analysis are the following: opportunities offered by the social change (consisting in a shift towards the data traffic and the growing M2M connections); new potential customers or higher volumes of sales which could be reached thanks to the new lower prices imposed by the regulations; growing demand for IPTV services; the cost advantages offered by the owned network, which is needed by any other enterprise, especially by the ones which don't own any, such as the OTTs.

First of all, the social changes which have been identified represent a great chance for any company operating in the industry: customers are clearly showing their preferences by choosing the NGN technologies to communicate. Companies could exploit the opportunities following the trend; investments and studies in these areas can represent a way to pursue innovation and offer new improved versions of the services in terms of critical parameters such as speed, reliability, quality of the service and security.
This is not true just for the NGN on the B2C market, but also for the IPTV on the B2C market and for the M2M connections on the B2B market.
The demand for IPTV and M2M connections is in full growth but such services are not yet diffused as the ones represented by Whatsapp, Skype, etc. Therefore, this seems the right moment to increase the

investments in the development and improvement of such services and being the first to reach the market with competitive offers.

Second, the company needs to exploit the opportunities coming from the lower prices imposed by the Eurotariff. Indeed, due to such regulations, companies seem destined to see their revenues getting lower and lower for the next years. However, this apparently bad news may turn out to be something good: a new lower price may increase the volume of customers. The people who believed that the prices for some Telco services were too high, now could change their mind and start buying and increase the demand for such services. Besides, the people who still don't have a smartphone, could think about buying one due to the lower prices for internet and the rising number of people who is not using SMS as frequently as some years ago. In this way, companies should partially pay back the loss in terms of revenues. If this opportunity is targeted by different companies, then the competitiveness on the market (especially in order to get to the new customers) will be very tough.

Third, Telco operators are witnessing the rise of the NGN technologies providers: they are building their success on applications and services which are using the Telco operators' networks. These networks represent a cost advantage for the owners.
Theoretically, by offering products comparable to the ones offered by the OTTs, the Telco companies could put the NGN out of the market: the source of revenues for the Telco companies, indeed, is represented by the use of the networks, which the customers are charged for (data plans, etc.).
OTTs, on the other hand, have to look for alternative source of revenues: since they are not charging the customers and they don't own the networks, profits can just come from other channels, typically offering the interfaces of their applications as a base to put third companies' advertisements. In this way, the companies interested to reach the final customers via these marketing channels, pay the owners of the virtual space where the marketing message will be published.
However, if the number of users reachable would suddenly drop, due to similar services offered by the Telco companies, the virtual spaces would lose attractiveness and the NGN providers wouldn't be able to charge a cost for the advertisement; therefore, they would be left out of the market with no sustainable business models.
Further analysis should be made in order to assess the feasibility of such strategy, since applications such as WathsApp, Skype, Facebook, etc. are extremely popular and they don't allow interconnectivity, i.e. two users have to both install the same application to communicate between each other.
As a consequence, it is difficult to imagine how to convince all the users to stop using such channels and start using new similar ones: the only way to convince a user to make such choice seems to come up with innovative and additional capabilities, included in such applications, which can capture the customers' attention.

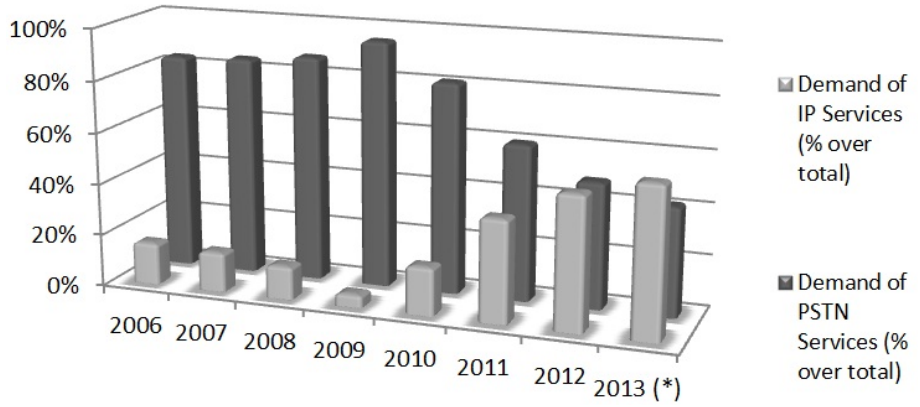
6.2.4 Threats

The analysis of the strategic environment and the market in which the company is operating have also shown potential threats which the business unit should consider, when designing the strategy.
The one identified in the analysis are the following: the reduction of the time-to-market, the increase of competition, the increasing number of substitute products, the political environment, the price reduction.

First of all, the fast changing scenario of telecommunications is affecting the performances of the companies. The time-to-market is the time between the idealization of a product and its actual commercialization: this is decreasing in the Telco market and, therefore, innovations are more frequent and fast.
As a consequence, companies have to work under pressure due to new technologies, new operators and new substitute products which start competing on the market at an impressive rhythm.
The way Telco operators used to work, the time allocated to the definition of strategy, implementation of changes, time-to-market, offers definition and so on, need to adapt to the new rhythm imposed.
This is very difficult due to the size and the organizational structures of such big operators: new smaller companies, instead, don't have to face such problems and can gain an advantage over the big Telco operators, exploiting possibilities and reaching the market before the others.

Second, the growing competition is also increasing the pressure on every company operating in the industry: especially the MVNOs, who once used to lead the market with a monopoly in the home countries, have been losing market shares due to the introduction of new operators on the market. This trend seems to keep going on without stopping.
The continuous introduction of new substitute products and alternative ways of communicating is increasing the problem for the MVNOs: customers are more attracted by the substitute services and a real switch in seems to be occurring, as described already (section 6.1.1.3).
This is a threat for Telefónica sales and revenues: the sales figures of two main categories of the Telco services (data and voice traffic), sold by a particular business unit within the group (which has been decided not to mention), have been compared. From the results obtained it is possible to evince how concrete the switch in the demand is (Exhibit 6.16).
First of all, the period selected for the comparison has been the timeframe between the year 2006 and the year 2012; the reason behind the choice is that both some years before the financial crisis and the most recent years had to be taken into account, in order to show the significant trend.
Second, for each year, the amounts of data and minutes sold have been compared: in order not to disclose any confidential information, the exact amounts of services sold have not been revealed. The

data have been shown in percentage terms: the total sales have been considered as the 100% and then the relative weight of the data services sold (over the total) has been compared to the relative weight of the voice services sold.



(*) January-April 2013

Exhibit 6.16 – Comparison between the total data services (IP) and voice services (PSTN) sold yearly by a particular unit within Telefónica.
Source: Author's elaboration; Data: Telefónica's confidential information

It is possible to notice how, from 2010, the demand of PSTN services is converting into demand of IP services. The *harmful* consequence is that people are not just buying more data traffic, they are using IP channels to replace the voice services and the SMS, using the OTT services.

Third, a further threat seems to be represented by the political environment. Regulations are limiting the prices for the Telco operators and creating a formal difference between the MVNOs and the OTTs – who are not affected by such rules.
If this trend will not change for the future, the Telco operators will be penalized: while they will have to respect a long list of rules about prices, quality, reliability, etc., the OTTs will not be controlled by any rule, with logical implications on the way of working of the two categories of companies.
On the one hand, MVNOs will have to plan accurately and check if any activity related to product or service development, network upgrade and pricing will respect the rules and regulations. On the other hands, OTTs will have much more freedom when making their choices related to any of the topics listed.

Finally, the price reduction imposed by the Eurotariff is the last threat which has been identified: the MVNOs will have to lower their price, both on the B2B and B2C market. This will decrease the margin and therefore their revenues, for the next years. The price imposed by the regulations is still allowing

the MVNOs to make a profit on what they sell, but, of course, a cost reduction can be of help in order to limit the impact which the new prices will have on the balance-sheets.
Concerning the B2B market, the situation is slightly different, since every operator will be facing the same problem.

6.2.5 Conclusions to the SWOT Analysis

The identified strengths, weaknesses, opportunities and threats are the output and conclusion of the analysis.
The next step is taking the findings obtained and using them as an input to define the strategic guidelines for the analyzed business unit.
The general purpose of the strategy is to increase the market share at minimum cost; in order to do that, each critical dimension of the industry (the identified CSF) must be taken into account and action plans must be generated in order to improve the business unit's performances for that particular factor.
Strategies must always combine both internal and external factors (Fernández-Balbuena, 2008), this is why the SWOT matrix obtained must be considered the basis for the new section.
The methodology used to define strategic actions is the one presented in the literature review: the dimensions of the SWOT analysis will be compared in order to find suitable strategic actions.

6.3 The Telefónica Case Study - Part IV: The strategic actions designed for Telefónica Global Solutions

Within Telefónica Global Solutions, the analysis of the strengths, weaknesses, opportunities and threats identified have led to the offensive, reactive, adaptive and defensive strategic actions presented in this section.
The action plans identified should improve the business unit performances related to the identified CSFs, optimizing the exploitation of strengths and opportunities and limiting the harmful consequences of weaknesses and threats.
The following four paragraphs describe each action: they have been organized into four parts – one for each strategic approach (offensive, reactive, adaptive and defensive).

6.3.1 Offensive Strategic Actions

Three offensive strategies have been identified by comparing strengths and opportunities, in order to check what opportunity is enabled by which strength.

- The first offensive strategy has been obtained by linking the strong brand image related to quality and reliability with two opportunities, at the same time: the social changes and the new potential customers which could be reached thanks to the new lower prices.

  This strategy consists in a new offensive pricing strategy to be added to the existing offers; indeed, surveys (Bachelet, 2013) have shown how the capped or throttled unlimited pricing strategy is the most common one, but the mobile operators which offered at least one truly unlimited data tariff have obtained the strongest growth from 2011 to 2012: this pricing strategy is supposed to give a high contribution to the customer-base growth (as shown in the section E of the Appendix).

  The reasons behind such results might be linked to the win-to-win situation which this pricing strategy seems offering: on the one hand the operators are benefiting from the higher revenues coming from the monthly (or any other agreed period of time) fee, which, in some cases may be higher than to the cost of the actual traffic used by the customer. On the other hand, the offer will be more attractive for the subscribers: nowadays, users are appreciating explicit messages clearly explaining the value offered for money; thanks to the truly unlimited pricing, they will have full value and will not have to worry about the traffic they are using as they cannot incur in any additional charge.

  Any other plan is just more difficult to explain to the customers due to the different limits they have, both on the total size and on the speed of traffic. Apart from that, customers have to worry about the data they are using and, with the popularity internet is gaining, they might consider more convenient having unlimited data rather than a limitation to their preferred communication channel.

  In particular, considering the country profile of Spain, among the different operators (Movistar, Vodafone, Orange, Yoigo), none is offering a truly unlimited plan (Bachelet, 2013).

  Due to the results shown, Telefónica should definitely be the first operator to introduce a data plan with a truly unlimited fee.

  By using its brand image related to quality and reliability, Telefónica can justify a truly unlimited tariff and capture the attention of new potential customers and the existing ones, who, accordingly to the social changes described, aims at using the data connection for any form of communication.

- The Telefónica's infrastructure, which is a very strong point, could enable the exploitation of the increased communication, caused by the social changes described. This could be done by stop distinguishing between fixed and mobile telecommunications channels. The two are evolving and converging into the same thing, obtaining a full IP line both for mobile and fixed channels which the future users expect to use without any difference. MVNOs should hurry and define new attractive offers for the new full IP lines, in order to benefit from the first mover's advantage and put OTTs (or any other competitor) out of the market – once the integration between fixed and mobile lines will be obtained.
- The opportunities created by the social changes exist also on the B2B market, especially considering the increasing demand for M2M connections.

  The broadness of Telefónica's customer base could enable the full exploitation of such opportunity.

  Telefónica should better define, promote and improve the existing services for the enterprises and clearly show how convenient can be for the customers.

  Potentially, enterprises could work much more efficiently if sharing their data on databases accessible by any workstation in a cloud-computing mode. M2M communications is not diffused yet, but it can offer a great potential to facilitate the communications over the supply chain of the enterprises.

  Telefónica should make very competitive offers to enterprise in order to stimulate the market demand for such services.

6.3.2 Reactive Strategic Actions

After studying the possible links between the strengths and threats identified, three possible reactive strategies have been identified in order to use the competitive advantages to limit the threats.

- First of all, the workforce capability, experience and commitment should be exploited in order to fight against the growing number of substitute products and services available, which means, basically, fight against the OTTs on the B2C Telco market.

  The reactive strategy identified has been obtained by evaluating the possibilities MVNOs have to fight against the OTTs. Four possibilities have been identified:

  1. Take no actions: Telco operators could pretend that nothing is happening and decide to check how the future scenario will adapt to the new trends and changes. The action might be risky: little space may be left on the market for the MVNOs. Indeed, they may just remain network providers, earning a profit on it, but without selling any service. The market created by Telco services could pass entirely to the OTTs.

2. Directly compete against the OTTs, offering the final users an improved version of what is already on the market. Something has already been done by Telefónica, who is offering alternative applications with better capabilities which enable the access to high-quality contents more easily. However, the problem seems to be that users have already installed applications such as WhatsApp, Skype, etc. which are not offering the interoperability with other applications. Therefore, the only way to reach friends, relatives and users is that everybody installs the same applications.

   Convincing such large number of customers to move to other channels at the same time seems to be very hard, unless very differentiating capabilities are offered by such alternative applications.
3. Third, Telco operators could establish partnerships with some OTTs, coming up with agreements and collaborations so that networks could be optimized for the OTTs applications and, thanks to the new collaboration, knowledge and resources could be shared in order to offer better solutions to the final customers.
4. Finally, new products and services can be offered to the final customers as substitute products for the existing OTTs services. The best candidate to be the most attractive reply to the OTTs seems to be the RCS.

   RCS are an enriched version of SMS which are commonly known as *Joyn*: they have no characters limitations and allow the attachment of video, photos and any other data to the text. Besides, they are sent over the internet and are fully interoperable among different operators, information systems, etc. Cell phones have begun to include RCS in the default factory version of the software they are sold with, at least in Spain, where the service has been launched for the first time last summer (The Economist, 11th Aug 2012). This means that they are integrated in the mobile phones information systems representing some advantages for the users, such as the optimal functioning of the application and the *ready-to-use* feature: Joyn, indeed, is designed to be already installed on the phones (no necessity to download the application) and it doesn't require users to create a profile.

   Everything seems suggesting that RCS may represent a valid substitute product to the OTTs' applications such as WhatsApp, etc.; the pricing strategy of such service is fundamental in order to make it fully competitive on the market: in particular, it should be conceived as a way to put the OTTs out of the market. Therefore, it is necessary to exploit RCS as a way to gain market share, rather than considering them just a new way to get profits. Companies shouldn't charge any fixed cost for the RCS (differently from the SMS, for example) and should even think about excluding them from the committed

MB of data traffic: the data traffic exchanged via RCS would be not counted in the data amount which, according the tariff paid, is available within a specific period of time.

With this strategy, users would find a double convenience in switching from WhatsApp, (or similar alternatives offered by the OTTs) to the RCS. On the one hand, WhatsApp has started charging users a fixed cost, after one year of free use(El País, 19th May 2013): uses may not be willing to pay that; besides, the MB sent and received to and from other WhatsApp users are counted in the mobile data plan. Finally, on the other hand, switching to RCS wouldn't require any effort: no installation and no compatibility issues.

RCS would eventually result more convenient to the final users who may really consider switching from OTTs' applications to RCS.

Among the four alternatives presented, the optimal decision to be taken seems to start from the fourth point, as shown by some studies made about the topic (Lonergan, 2013). However, relying just on RCS doesn't seem to be enough: in order to diversify the risk linked to the strategy, further actions should be taken at the same time.

Due to the considerations made above, about the difficulty of convincing a big mass of customers to move to other applications, the development of direct alternative products (such as social networks and communication applications, similar to the one offered by the OTTs and without important differences, like the ones introduced by the RCS) seems pointless. A mix of efforts dedicated to the development of the RCS and actions (such as the introduction of tariffs, regulations, etc.) dedicated to hamper the OTTs in using the Telco operators' networks, seems to be the best mix to fight against the OTTs.

- A second reactive approach has been identified by exploiting Telefónica's strong brand image to fight against the increasing competition. A new communication and promotion strategy could be defined in order to differentiate from the competitors and follow the new customers' values. Indeed, Telefónica should realize that end users are nowadays giving much more importance to value for money and that they are better informed and aware of what is offered to them, at least compared to the past. Therefore, each message should clearly define the MB or GB of traffic included and the speed allowed to download and upload the data, for example.

  Second, concerning the sales promotion, companies are also evaluating the idea of excluding some highly-used applications from the computation of the data plan purchased by the customers. This could be very attractive for the mobile users who will not see MB exchanged by surfing on such websites or by using specific applications counted in their data plan. The perception would be that unlimited MBs on determinate channels were given for free. In this sense, the communication should also clearly specify what type of websites, applications, etc. are counted in the data plan offered and which are excluded.

The action mentioned can be used especially in order to promote new services, such as the RCS, as described in the pricing strategy.

The advertising of RCS should also point out all the advantages which the service offers: interoperability, no need of creating an account, security, etc.

- Finally, the imposed regulations on prices may decrease the revenues obtained by MVNOs on the future traffic sold. On the B2B market, this can be offset exploiting the broadness of customer base Telefónica has.

  In particular, the agreements with the high number of customers can be revised with the goal of increasing the committed volumes. In this way, the revenues lost due to the lower price per minutes will be regained in terms of more minutes sold.

6.3.3 Adaptive Strategic Actions

The adaptive strategies have been identified by checking if, for any weaknesses, the exploitation of any opportunity is prevented.

The following three strategic actions have been proposed in order to limit the consequences coming from the weaknesses – the purpose is finding a way to still exploit the opportunity independently from the weakness related to it.

- First of all, the opportunities of benefiting from new potential customers who will buy more communication services due to the reduction of prices and to the new social trend is a bit hampered by the lack of generating innovation capabilities. In such context the dismissal of an existing product like the SMS and MMS is not recommended.

  Apparently, the negative trend shown in the demand of SMS and MMS, which has been described in previous sections, may suggest that MVNOs could think about dismiss such services and save the costs for maintaining them active, since the demand doesn't seem to justify any effort.

  However, additional considerations could be done: first of all, the costs produced by SMS and MMS are extremely low for the Telco operators, since the data and the size of SMS and MMS are both very low; the meaning is that the economical and operational efforts made by companies to keep such services alive are almost negligible.

  Besides, SMS are still used by banks, online booking services, Telco operators, etc. to inform customers about confidential information (balance, codes, etc.). They are still a channel which is truly ubiquitous and, although the internet on phones is becoming really diffused it is still not used by the 100% of cell phone users, therefore SMS still have a market – at least potentially speaking.

For the future, SMS shouldn't be eliminated: they should be improved and used as a substitute product in order to enable Telco operators to compete against the OTTs (they can be turned into RCS as described in the reactive strategic actions).

- Second, the opportunity offered by the social change and the different structure of the demand is hampered by the complexity within Telefónica group. Indeed, it is difficult to stimulate innovation, rapid changes and adapt to the new environment with such high level of complexity.

  The proposed action to benefit from such opportunity is twofold: from the one hand, Telefónica should look for smaller companies which can be easily acquired and dedicated to innovation and IP services; on the other hand, pursue *open innovation*. Although, apparently, the first proposition could further complicate the corporate structure, however, the acquired company can be treated as an external complete independent entity: an example can be offered by the 2009 acquisition of Jajah, a VoIP service provider, by Telefónica (Dealbook, 2009). This should be done with more frequency and resources should be dedicated to such projects.

  Concerning the second proposition, instead, open innovation consists in opening the innovative process to the use of external resources and capabilities; due to the fast changing environment, large companies cannot afford to limit their innovation to the fields where they have a consolidated expertise: they should boost innovation and open it up to new innovative fields, co-operating with other enterprises (Rohrbeck et al., 2009). A practical example of open innovation is represented by Deutsche Telekom: the enterprise is using, together with the other suppliers and enterprises it is co-operating with, a German City, which has become *T-City* according to an open innovation project. The city is currently used to test the innovative solutions over its inhabitants.

- Finally, the opportunity offered by the social change is also hampered by a second weakness: the lack of ability to generate innovation. The proposed solution, in order to still exploit the opportunity, is the following: improve the current product and services portfolio by adding some customer-based features without modifying the final prices.

  Some examples for improvements will be described as following. These consist in: additional support services, optimized business models to sell data services, services which overcome the ones offered by the OTTs.

  First of all, the additional support services can include informative messages, containing complete and precise details about the data plans available and giving information about how much data is left with and interactive interfaces in which customers are offered the possibility to choose what to do once the data bought will be expired. User friendliness and no charge or commissions are the key features which should differentiate such service.

Second, the current portfolio could be made more attractive to the end customers by including some services in the internet packages sold. Examples can be the possibility to storage customers' data in secure databases, accessible by the customers in a cloud-mode. Moreover, distinctive applications should be offered by the internet connection providers, allowing improved versions of the existing services, such as high quality video players, high quality video-conferences and video-calls applications, etc.

A theme of concern, which is becoming popular among the final customers, is the security of all the messages, calls and data shared on the internet through the NGN applications. The Telco operators are the owners of the networks on which such data are flowing: they have the possibility to assure the customers about the safety of their data and the guarantee that their data are not sold to other companies for marketing purposes.

Third, the additional services can include more M2M connection options directly from the phone, such as phone payments options, mainly. This can become a source of revenues for the MVNOs in the future: the companies whose products and services will be available and sold through the mobile can be charged a commission cost by the MVNOs, who are enabling the secure data transaction. QR codes could be exploited for these purposes.

6.3.4 Defensive Strategic Actions

The defensive strategies are determined by taking threats and weaknesses together into account.

The analysis will be done following this perspective: first, it will be necessary to look for the threats which are more likely to become a real problem, due to a specific weakness. After all the linkages have been found, actions must be identified, in order to show how the consequences from a particular threat could be avoided or limited. The identified links and strategic actions are described below:

- The weakness which is enabling the consequences coming from the threats is the lack of ability to generate innovation, mainly.

  In particular, due to reduction of the time-to-market and the growing possibilities of substitute products and services, the lack of innovation could put Telefónica out of the market of communication services. Nowadays, MVNOs are *watching* the rise of WhatsApp, Skype and similar OTTs: they are gaining market shares over the MVNOs, who were once leaders and unique providers of SMSs and voice connection.

  In order to avoid such scenario, the solution proposed is to revise the research and development unit. This should be kept outside the enterprise as an independent entity: R&D projects should follow the strategic decision, mission and vision of Telefónica but there shouldn't be constraints in terms of business models, etc. which could limit the creativity of new solutions. The services offered by the OTTs, for example, are the same as the existing ones:

they are using a different communication channel, better user interfaces and a different business model, which is extremely convenient to the end users. By keeping the R&D unit as much independent as possible, the *old* business models, communication channels exploited and way of working, which have been used so far, can be freely redefined and improved. Telefónica Digital, for example, is a business unit dedicated to the improvement of new services and solution but it is strongly linked to the corporate culture, procedures and structure which are affected by the ways Telefónica has been working so far. These may negatively affect and limit the creativity of the solutions proposed.

- The lack of ability to generate innovation is also enabling the harmful consequences coming from the increased competition. Other MVNOs, indeed, could be more efficient than Telefónica in proposing and offering improved versions or new services and solutions. What is sure is that any operator in Europe will have to face the consequences of the price reduction, imposed by the Eurotariff. In such context, some operators may have some difficulties in keeping the same level of Capex dedicated to the improvement and upgrade of their infrastructures; they may think about reducing the investments in order to offset the potential revenues lost. For Telefónica and its weakness, it is recommended to keep the same level of investments or even increase it..

  The infrastructures and the network owned by the Telco operators are a key asset which allows the companies to be fundamental in the industry as the only ones providing such infrastructures within the home country or countries.

  Any competitor or substitute products provider uses such networks in order to reach the customers and allow the customers to communicate among each other.

  Therefore, continual upgrades, updates and improvements are needed and fundamental to improve speed, quality and level of service both on the B2B and B2C market. Any improvement or change implemented over Telefónica's networks, is made, nowadays, with a long term perspective: using technologies which will allow the switch to the use of IP communication only.

  Besides, the infrastructure is also one of Telefónica's strength: any of the strategic actions proposed can work and improve the company situation on the market only if the basic infrastructure will still be the competitive advantage. The future strategy which will be designed should consider the excellence in such dimension as a prerequisite.

6.3.5 Conclusion to the Case Study

As a conclusion to the case study, a brief comment to the strategic actions has been included in this section.

The strategic actions which have been identified can be organized in the following table (Table 6.6).

		Strengths					Weaknesses		
		Workforce Capabilities, Experience, Commitment	Success History	Brand Image Related to Quality Reliability	Infrastructure	Broadness of Customer Base	Complexity	Lack of Flexibility	Lack of Ability To Generate Innovation
Opportunities	Social Changes: NGN, M2M, IPTV			Truly unlimited pricing	Full IP interconnections	Empower B2B services	Acquisitions & Open Innovation		Improve existing services
	New Potential Customers/ Volumes Due to Lower Prices			Truly unlimited pricing					No dismissal of SMS & MMS
	Cost Advantages Against the OTTs				Full IP interconnections				
Threats	Time-To-Market Reduction								Modify R&D business unit structure
	Increase of Competition			Modify Promotion & Communication					Keep/Increase the Capex level
	More Substitute Products and Services Possibilities	Fight against OTTs							Modify R&D business unit structure
	Political Trends								
	Imposed Price Regulations					Increase Committed Volumes			

Strategic Actions: Offensive Reactive Adaptive Defensive

Table 6.6 – Strategic Actions Identified for Telefónica Global Solutions
Source: Author's elaboration

Comparing these actions with the identified CSFs (section 6.1.2), it is possible to see that they are focused on those CSFs where Telefónica's performances can be further improved - the ability to generate and adapt to innovation and the complexity, mainly.

Besides, some strategic actions are also aimed at keeping or improving the already strong position of the company. The CSFs affected, in these cases are: the service reliability, the broadness of the network and the continuous improvement.

This little comparison can show how the strategic actions are actually designed to improve the performances in key dimensions for the European Telco industry.

The methodology chosen has allowed linking the strategic actions to the previous findings but it doesn't provide any suggestions about how to deal with the current weaknesses of a company. The

actions are just aimed at limit the negative effect of such weaknesses, without offering a long-term solution for such weaknesses.

This has been done on purpose: improvements in the weak dimensions identified related, for example, to the corporate organization or to the information systems would require a lot of time and money both for planning and getting used to the TO-BE configuration. Due to the PEST and SWOT analysis results, the priority has been given to define proper strategic actions aimed at avoiding the imminent consequences coming from the threats, especially represented by the OTTs and the loss of market share. Therefore, in the short-term, no changes both for the organization and the information systems have been included in the strategy.

Once the main threats have been neutralized and the opportunities exploited, then the company should think about re-organizing itself and find the way to optimize its efficiency.

Finally, strategic plans have usually a timeframe of validity and application. For the case proposed, a timeframe would be very difficult to estimate. Due to the fast-changing environment, the Telco industry should be constantly monitored in order to find out if any change in the strategic environment occurs. Whenever this is verified, then, the proposed strategic actions will lose their validity. Therefore, the new opportunities and threats should be identified and linked to the strengths and weaknesses in order to define new strategic actions.

7. Conclusions

This chapter is dedicated to the conclusions of the research: in the following three sections the results achieved, the problems faced and the limitations will be described.

7.1 Results

The sections of chapters 5 and 6 present their own conclusions, showing a little summary of the results obtained in the specific section and, when possible, offering a model or framework to present them.
In the following sections, the general conclusions will be described and they refer to the whole research performed.

First of all, the results obtained mainly consist in the research process used: this can be of help for future similar researches aimed at analyzing the strategic environment and related strategic actions. The methodology followed has been described in chapter 5 and has been applied in chapter 6.
In particular, thanks to the literature studies, the *revised* methodology has revealed to be very effective in coming up with strategic actions, strongly related to the environment analysis. It is mainly thanks to such methodology, indeed, that the right levels of specificity relatively to the particular enterprise and the right levels of coherence to the particular situation, created by the strategic environment, have been achieved.

Second, in terms of practical results, two main considerations can be made.
The findings coming from the strategic environment analysis can be very useful for any operator in the European Telco industry: they are quite specific for the industry as a whole and come from studies which included both quantitative and qualitative analysis. Besides, the sources reliability of the sources used represent a solid base for the considerations made: the findings obtained are coming from consultancy projects and market analysis which were committed by Telefónica to external firms.
The research is therefore a merge of different studies which have been combined to show a clear picture of the way Telefónica is working: these have been used as a basis to draw specific conclusions for the Telefónica case.
Such conclusions (which begin with the SWOT analysis and finish with the strategic actions proposed) are the result of the final step of the process which was aimed at analyzing the strategic environment; therefore, as being part of the same process, they are logically related to the previous analysis.

Some of the trends and issues identified are not affecting the European Telco market only: they are worldwide phenomena which can be tackled differently according to the specific local market features. An international company like Telefónica could therefore use the analysis of the European Telco market as a basis to include other geographical areas in the analysis, having already an idea about the kind of trends expected to be found. This consideration mainly applies to the OTTs which are very successful on a worldwide basis.
On the other hand, the topics which are specific for the European market (such as the Eurotariff), can still be useful in the future, in case similar phenomena will affect other markets.

Finally, the research has also offered an understanding of different phenomena: the Telco business, the Eurotariff and, mostly, of how PSTN and VoIP connections work. The level of detail adopted when presenting the technical topics is not very high; indeed, those parts have been designed to offer a general understanding of the technical themes behind the Telco business which were necessary to truly understand what problems and opportunities Telco companies could deal with. However, the topics could be much more detailed and complicated.

7.2 Limitations

Together with the results, the research presents some limitations.

First of all, the limited vision over the Telefónica's operations has complicated the data gathering and, mostly, the understanding of the way the company works.
As a consequence, when describing the way Telefónica is working, a high level of detail has been used, limiting the perspective just to the chosen business unit within the group: Telefónica Global Solutions.

Second, although some of the findings have a worldwide validity, some others are specific for the European area. A limitation is therefore represented by the fact that the analysis is limited to the European Telco industry: this has been a choice mostly due to the differences existing between the geographical segments of the worldwide market.
The European Telco industry has been chosen for the analysis as it seems the most critical one: an effective strategy for such segment seemed impellent.
In the Telefónica's case, for example, the consolidated revenues are distributed as following (Exhibit 7.1):

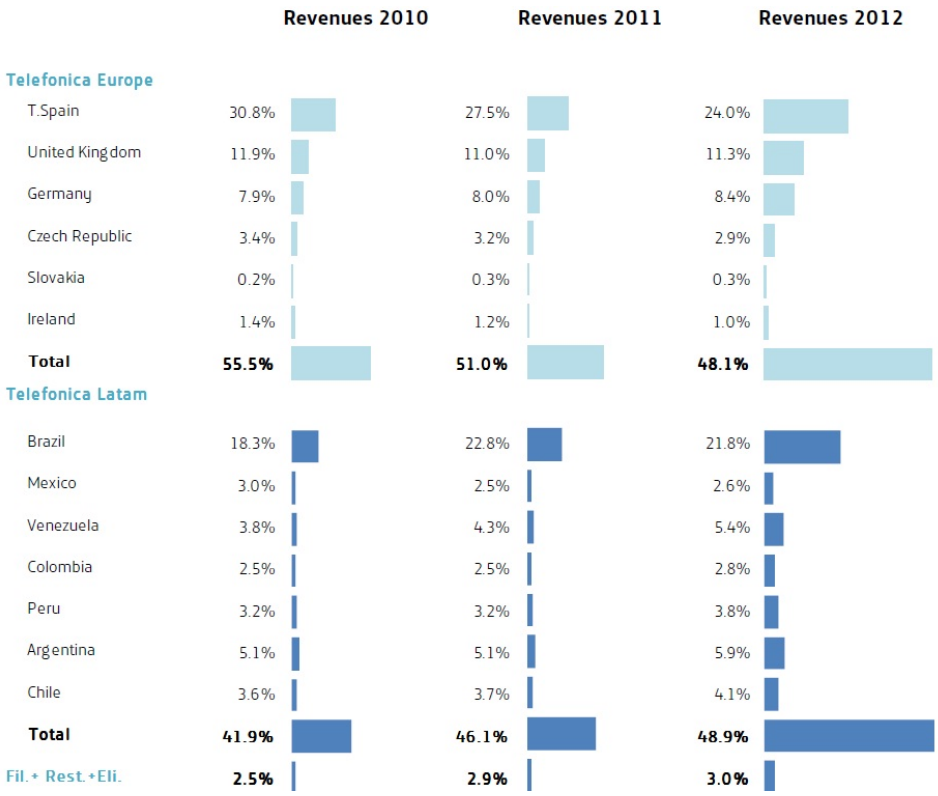


Exhibit 7.1 – Contribution to Yearly Consolidated Revenues by Country
Source: Telefónica, 2013 - 2012 Consolidated Financial Statements, page 208

It is possible to see that in 2012, Latam (Latin America) area (total revenues: 48,9%) has overcome the European area (total revenues: 48,1%) in terms of revenues contribution to the total.
The growth of Latam is also very evident compared to Europe, which is a market that is not growing.
Besides, Europe has been chosen in order to present and understand the phenomena of Eurotariff: the European market is the only one affected by such regulation.

Finally, once the strategic actions were identified, the research lacks of a proper plan detailing how to implement them with a related cost analysis.
This information was beyond the purposes of the thesis and requires a much broader perspective over the company's operations, performances and resources.
The findings and strategic actions identified should be evaluated and, if considered of interest, dedicated projects can be designed to manage their possible implementation.
A similar research could be developed over the topic, trying to identify if models for offensive, reactive, defensive and adaptive strategies implementation exist and can be used for the presented case.

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Appendix

A) The Incumbents in Europe

Albania	Albania Telecom	**Latvia**	Lattelekom
Andorra	Andorra Telecom	**Liechtenstein**	Telecom Lichtenstein
Austria	Telekom Austria	**Lituania**	Lietuvos Telekomas
Belgium	Belgacom	**Luxembourg**	P&T Luxembourg
Bosnia-Herzegovina	BH Telecom	**Macedonia**	Makedonski Telekomunikacii
Bulgaria	Vi vacom	**Malta**	Maltacom
Croatia	T-Hrvatski Telekomikacijie	**Moldova**	Moldtelecom
Cyprus	CyTA	**Monaco**	Monaco Telecom
Czech Republic	Cesky´ Telecom	**Montenegro**	Crnogorski Telekom
Denmark	TDC	**Netherlands**	KPN
Estonia	Eesti Telefon	**Norway**	Telenor
Faroe Islands	FøroyaTelecom	**Poland**	TPSA
Finland	TeliaSonera	**Portugal**	Portugal Telecom
France	France Télècom	**Romania**	RomTelecom
Georgia	JSC United Georgian Telecommunications	**Serbia**	Telekom Srbija
Germany	Deutsche Telekom	**Slovakia**	Slovenské Telekomunikacie
Gibraltar	Gibraltar Telecom	**Slovenia**	Telekom Slovenije
Greece	OTE	**Spain**	Telefónica
Greenland	TeleGreenland	**Sweden**	TeliaSonera
Guernsey	Guernsey Telecom	**Switzerland**	Swisscom
Hungary	Matav	**Turkey**	Turk Telekom
Iceland	Siminn	**UK**	BT (British Telecom)
Ireland	Eircom	**Ukraine**	Ukrtelecom
Isle of Man	Manx Telecom		
Italy	Telecom Italia		
Jersey	Jersey Telecom		

Table A – Incumbent operators in Europe
Source: Whalley, Curwen, 2012

B) Telefónica

B.1) International Network

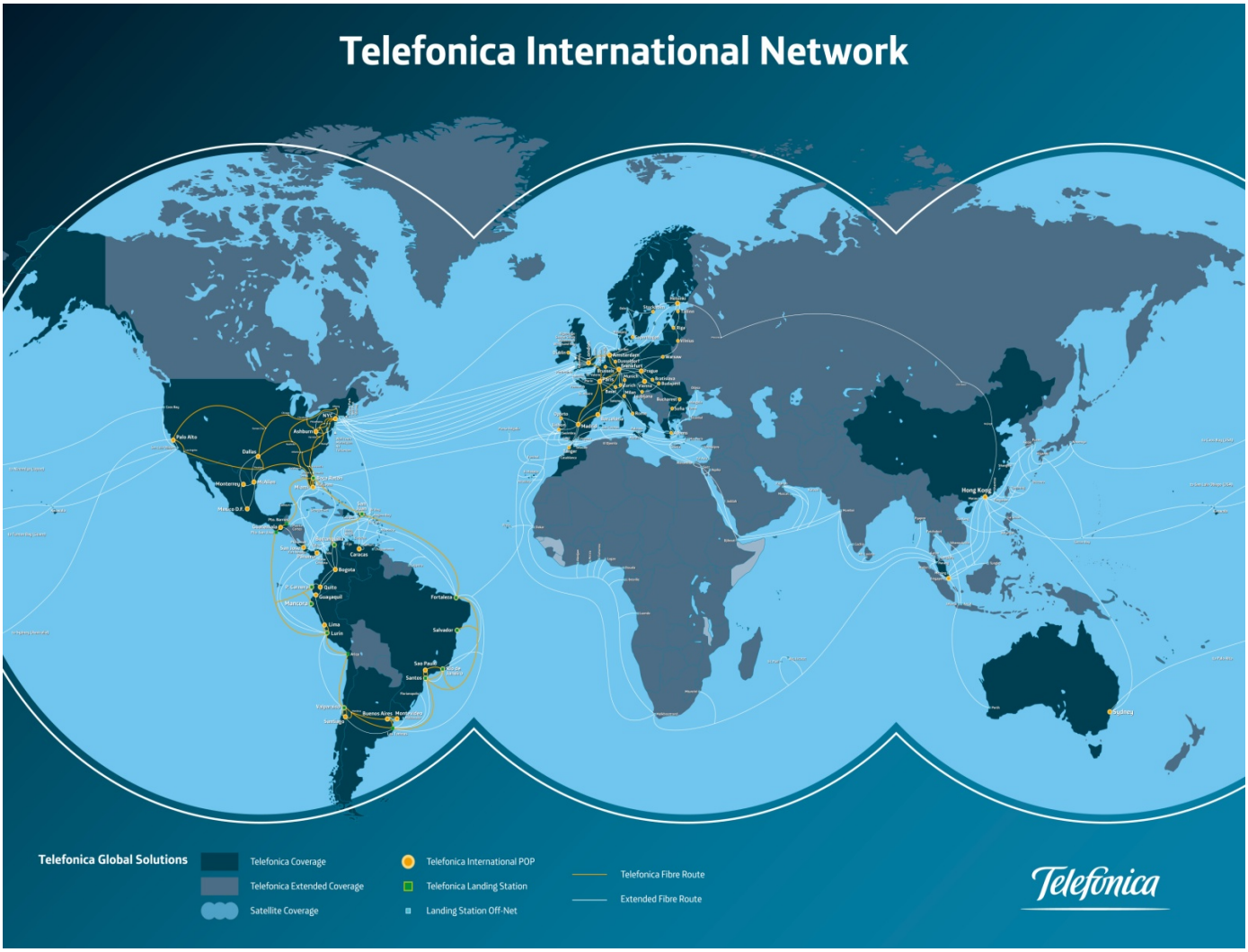

Exhibit B.1 – Telefónica's International Network
Source: Telefónica, 2012

B.2) Societary Structure

Telefónica Latino-America Group		Telefónica Europe		Other	
Companies	**% Stake**	**Companies**	**% Stake**	**Companies**	**% Stake**
Telefónica Moviles Peru	100	Telefónica de Espana	100	Telefónica de Contenidos	100
Telefónica de Argentina	100	Telefónica Moviles Espana	100	Telefónica International Wholesale Services (TIWS)	100
Telefónica Moviles Argentina	100	Telefónica UK	100	Jajah	100
Telefónica Moviles Chile	100	Telefónica Deutschland	100	Tuenti	91,4
Telefónica Moviles México	100	Telefónica Czech Republic (Including Telefónica Slovakia)	69,4	Telco SpA (through which – indirect stake: 7,19% of Telecom Italia)	46,2
Telefónica Moviles Guatemala	100	Telefónica Ireland	100	DTS, Distribuidora de Television Digital	22
Telefónica Venezolana	100	Tesco Mobile	50	Hispasat	13,2
Telefónica Ecudor	100	Telyco	100	China Unicom	5
Telefónica Moviles Panama	100	Telefónica Soluciones de Informatica y Comunicaciones de Espana	100	Amper	2,9
Telefónica Moviles Uruguay	100	Telefónica Telecomunic. Publicas	100	Portugal Telecom	2
Telefónica Celular Nicaragua	100	Iberbanda	100	BBVA	0,8
Telefónica Costa Rica	100	Be	100		
Telefónica Moviles El Salvador	99,2	Acend Technologies	100		
Telefónica del Peru	98,4				
Telefónica Chile	97,9				
Telefónica Brasil (Including 100% of Vivo)	73,9				
Telefónica Telecom	70				

Exhibit B.2 – Telefónica group's societary structure
Source: Telefónica, 2012

B.3) Commercial Brands

Exhibit B.3 – Telefónica's commercial brands
Source: Telefónica, 2012

C) The Demand for Internet Fiber and Broadband Connections

Technology Group	Q4 2011	Q4 2012	% Growth Year	Year Adds
FTTx (inc. VDSL, VDSL2)	89,781,231	114,440,536	27.5%	24,659,305
DSL (inc. ADSL, ADSL2+, SDSL)	353,990,359	366,658,476	3.6%	12,668,117
Cable Modem	115,232,185	123,550,859	7.2%	8,318,674
FTTH	16,044,679	19,308,751	20.3%	3,264,072
Fixed wireless			12.0%	

Exhibit C – Demand for Internet Fiber and Broadband connections. (Data in number of users)
Source: Porras, 2013 – page 8

D) The Conversion in a VoIP Call

The conversion from the analog voice to the digital internet format is a necessary phase which allows a call to be sent over the internet; however, this is also the most delicate phase of a VoIP call.

During the transaction from the continuous-time (of the voice signal) to discrete-time (of the digital signal), some information is inevitably lost: there's no way to keep the information between the different samples. As a consequence, obviously, the critical parameter which determines a good conversion is the number of samples taken: this number must be neither too low – as the quality would be bad and the result won't match the original analog signal, nor too high – as, although the quality would be great, the data would be too big to be sent and won't be convenient.
Several studies over the topic have been accomplished and a theorem (called Nyquist-Shannon theorem) was found: the theorem helps estimating the right number of samples to be considered for a perfect conversion.
According to the theorem:
"(…) if you have a signal that is perfectly band limited to a bandwidth of f_0 *then you can collect all the information there is in that signal by sampling it at discrete times, as longs as your sample rate is greater than* $2 * f_0$ *(…)"* (Wescott, 2010)

However, many authors (Wescott, 2010) point out how this theorem doesn't solve the problem of the loss of information which occurs during the conversion and cannot guarantee the best results from the sampling procedure.

The rate obtained with the theorem cannot be taken as a reference in order to have a general rule giving a minimum sampling rate to be used for any conversion.
First of all, the theorem is based on a "perfectly band limited" signal, meaning that the signal must have absolute no energy outside some finite frequency band. This is a very strong assumption: it is almost impossible to find such signals in reality. As a consequence, the sampling will never be perfect but, still, the theorem can give as a result a rate which can be "good enough".

Second, the phenomenon of aliasing was, according to some authors (Wescott, 2010), neglected by Nyquist-Shannon in their theorem. Aliasing is a phenomenon which could occur due to the loss of information during the conversion.
Indeed, with some information missing, it may be the case that two possible inputs both result in the same outputs, after conversion, causing an aliasing which can then cause misunderstandings in the communication.

To sum up, Nyquist-Shannon theorem is useful to have an idea of the sampling rate which we can use: however, we should be aware that such rate is not proven to give a perfect conversion, without chances of mistakes. A deeper understanding of aliasing and filtering is necessary, in order to get closer to the rate which ensures the perfect conversion.

E) MVNOs Retail Revenues for Pricing Strategy

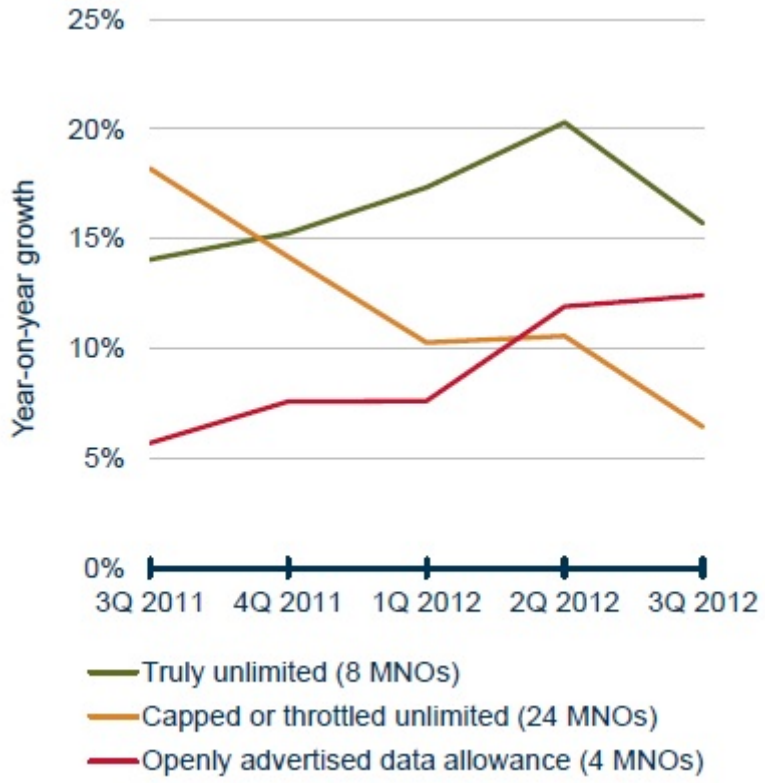

Exhibit E – Year-on-year rolling growth in retail data revenue for MVNOs by pricing strategy
Source: Bachelet, 2013 – page 15