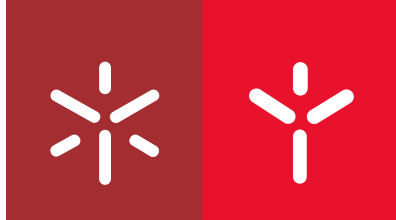**Universidade do Minho**
Escola de Direito

João Novo Faria Lages

Software Interoperability:
The EU Competition and IP Scrutiny

março de 2016

Universidade do Minho
Escola de Direito

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**Software Interoperability:
The EU Competition and IP Scrutiny**

Dissertação de Mestrado
Mestrado em Direito dos Negócios, Europeu e Transnacional

Trabalho realizado sob a orientação do
Professor Doutor Pedro Madeira Froufe
e da
Doutora Maria Miguel Carvalho

março de 2016

Declaração

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Título da Dissertação: Software Interoperability: The EU Competition and IP Scrutiny

Orientadores: Professor Doutor Pedro Madeira Froufe e Professora Doutora Maria Miguel Carvalho

Ano de conclusão: 2016

Designação do Mestrado: Mestrado em Direito dos Negócios, Europeu e Transnacional

Universidade do Minho, ___/___/_____

Assinatura: _____

Acknowledgments

Firstly, I would like to express my sincere gratitude to my family and friends who directly or indirectly contributed for the realization of this essay. Ilda Novo and Albino Lages, your support was particularly important throughout my years of study. This accomplishment would not be possible without them.

I would also like to thank my supervisor Professor Pedro Madeira Froufe and my co-supervisor Professor Maria Miguel Carvalho for the suggestions given, the availability, as well as, for pointing me in the right direction.

Abstract

This paper makes an approach to software interoperability. An emphasis is added to situations where the lack of interoperability generates several problems.

The relation between copyright and competition law are the main subjects to be attended, specifically, the relation that those areas have with the interoperability issues.

The approach made in this essay is limited to the European Union legal context. The Software directive according to the authors' opinion has several failures that influence competition in the EU, these failures will be referred and recommendations presented.

The lack of interoperability in the technological market is an issue of great relevance due to the high networking effects that characterizes the referred market. This means that a new and innovative product that wants to pierce the market will have great difficulty to do so if interoperability information's are not provided by the few dominant undertakings. For example: If a new internet browser is created it needs access to the interoperability information of the main PC software providers (Windows or Mac OS). If access is not granted it would be nearly impossible to introduce this product in the market.

The example given usually has competition effects as well as the way we perceive the type of intellectual property protection to be granted.

Keywords: Interoperability, competition law, copyright, abuse of dominant position, interfaces, intellectual property, software, decompilation, reverse engineering, telecommunications law, software directive.

Resumo

Este trabalho literário faz uma abordagem à questão da interoperabilidade dos sistemas informáticos. Enfase é dado às situações onde a falta de interoperabilidade origina diversos problemas.

A relação entre os direitos de autor e o direito da concorrência são os principais temas abordados, mais concretamente a relação dessas áreas com a questão de interoperabilidade.

A abordagem feita nesta dissertação é limitada ao contexto legal da União Europeia. A diretiva de *Software* de acordo com a opinião do autor contém algumas falhas que influenciam a concorrência na UE, essas falhas serão mencionadas e recomendações apresentadas.

A falta de interoperabilidade no mercado tecnológico é um assunto de grande relevância devido á importância dada aos efeitos de *networking* que caracterizam o referido mercado. Isto significa que produtos inovadores que querem entrar no mercado terão grandes dificuldades para o fazer caso as informações de interoperabilidade não sejam providenciadas pelas empresas dominantes. Por exemplo: Se um novo motor de busca da internet é criado, este necessitara de acesso às informações de interoperabilidade por parte dos principais fornecedores de *software* (*Windows* ou *Mac OS*). Caso o acesso a essas informações seja negado, será virtualmente impossível introduzir o novo produto no mercado.

O exemplo providenciado anteriormente por norma, tem efeitos na concorrência assim como na forma como percebemos qual o direito de propriedade intelectual utilizado para proteger essas informações.

Palavras-chave: Interoperabilidade, direito da concorrência, direitos de autor, abuso de posição dominante, interfaces, propriedade intelectual, *software*, decompilação, engenharia reversa, direito das telecomunicações, diretiva de *Software*.

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Abbreviations

API – Application Programming Interface

APP – Application (computer program)

EC – European Community

EU – European Union

IP – Intellectual Property

IPR – Intellectual Property Right

ISO – International Organization for Standardization

IT – Information Technology

M&A – Mergers and Acquisitions

NRA – National Regulatory Authorities

NRF – National Regulatory Framework

PC – Personal Computer

R&D – Research and Development

S-C-P – Structure-Conduct-Performance

TFEU – Treaty on the Function of the European Union

TRIPs – Trade Related aspects of Intellectual Property Rights

TTBER – Technology Transfer Block Exemption Regulation

TV – Television

UN – United Nations

USB – Universal Serial Bus

WCT – WIPO Copyright Treaty

WIPO – World Intellectual Property Organization

WTO – World Trade Organization

Introduction

First of all, it should be noted that this paper was created in the scope of the LL.M in European and Transglobal Business Law. The LL.M program is a diversified program with different fields of study such as competition law, tax law, contract law, European Union law, international economic law, among others. However, in the year the author attended the masters program it did not covered aspects of intellectual property law and this was one of the reasons why the author choose the intellectual property field, in order to get acquainted with different fields of study besides those that are part of the LL.M curricular semester. Other reason for the choice of such theme was the great interest for the technological area and the relation and effects that intellectual property and competition law can have in the development of such field as well as the influence on how quickly new technologies are developed.

The author, during the essay will address the question of interoperability between software's. Approaches are to be made in the fields of copyright, competition law, interfaces, EU case law, reverse engineering, decompilation, EU lobbying, competition for and in the market, telecommunications law, ex-post and ex-ant protection as well as economic and philosophical analysis.

This study will be limited to the European Union level despite of its global relevance. The author, sustains that the European legislation in what concerns access to interface information[1], has many failures and some changes should be made to the Software directive.

The legislation that is used in the present day to solve problems of interoperability is sometimes ineffective to give a response to the daily development of the technological market.

Delimitations

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[1] Information that gives interoperability with the software.

This essay has many relations with different fields of study, but in this paper the analysis made will be limited to the intellectual property and the competition law approach.

In the competition law analysis the main focus will be made in the field of abuse of dominant position article 102 TFEU. In the intellectual property analysis the focus will be made in the area of copyright. Areas of competition law such as cartels and research and development in its traditional analysis will be left out of the study scope. In the intellectual property area, patents, trademarks, industrial designs and trade dress will be also left aside, giving emphasis to copyright.

International trade law is relevant when studying this subject, but in this paper the author will be limited to the European Union law.

It is also important to know that this essay will give some approaches to areas beyond law, such as economic, technological and philosophical areas.

Methodologies

The methodology used for writing this essay consists essentially in library based research, case law and websites.

Chapter I is mainly based in legal descriptive research. Chapters II, III and IV are based in legal descriptive as well as analytic research were the author introduces his opinion.

Structure

Chapter I consists in introducing the main areas of interest that the essay will deal with. It gives a description and a first analysis to general concepts of the study subjects.

Chapter II, III and IV are factual chapters that provide core understanding as well as opinion about the topic. Chapter II and III are the main providers of knowledge in what

concerns the specific questions of the topic. Chapter IV gives possible solutions and recommendations to be made.

Chapter I

General Introductions to the Topic

1. Intellectual Property Rights Focus

It was in the year 1469 that exclusive printing rights were granted to John Speyer[2] (the inventor of the first printer). Until then copies of books were made by those few ones that knew how to read and write and the copying method was made manually with hard work involved. Intellectual property is directly linked with innovation, creation and consequently economic development.

When giving authors or inventors a certain level of protection we will be giving them the security to protect their inventions and creations and to take the respective economic advantages of their hard work. It is not surprising that the countries that offer better protection in this field are those ones with higher economic and technologic development. These rights aforementioned are of great importance in order to stop free-riders that are always willing to collect profits from others work.

As Galileo Galilei said "…it does not suit me that the invention, which is my property and as created by me with great effort and cost, should become the common property of just anyone…"[3]. IP laws do provide the innovator the possibility of having a monopoly on the protected product.

Intellectual property can be a very controversial issue since this can be perceived as a way of controlling common knowledge and our thoughts; many might argue that information needs to be free; others might think that intellectual property is outdated.

With the introduction of cyberspace, intellectual property rights might be something impossible to control. Information since the early times is considered a valuable asset. There will always exist someone trying to profit with it, on the other hand, information is nowadays more and more accessible and disperse, because of the new methods of communication.

One of the ways that humans found to protect this asset was through laws. We should perceive the clash between IP rights and the increasingly technological world as an opportunity to find a balance between those who promote the technology revolution and those

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[2] Forrester, Ian S. ""Regulating Intellectual Property via Competition? Or Regulating Competition via Intellectual Property? Competition and Intellectual Property: Ten Years On, the Debate Still Flourishes"." *European Competition Law Annual* (2005), pp. 59.

[3] Lehmann, M. ""Property and Intellectual Property - Property Rights and Restrictions on Competition in Furtherance of Competition"." *International Review of Intellectual Property and Competition Law* (1989), p.8.

who promote the creation of inventive and creative works, and this should be achieved by having respect for both.

Let us imagine now that we are consulting a video on some random website, the video that we are watching is possibly protected as a motion picture work, the website is considered a literary work, the software that runs the video is also a literary work, the browser you use is considered a computer program as the operating system of your device. There are also many components of your computer or devices that have patents, the name of your device is a registered trademark, the search algorithms that are used on the web are trade secrets.

If we see this underground world in this way it might seem complicated, however, everything in our daily life runs with a strange fluidity. We can compare this with our internal organs, if we analyse the function of each of the organs it would be extremely complicated, however, without even noticing, everything functions in a perfect harmony.

When we are talking about IP, is when the subject makes an input of all the aspects that led him to the creation of an idea, this idea is protected if it generates to a form in which the humans can gain access. In its pure form IP is the embodiment of intellectual effort and talent.

IP rights are territorial, and typically applied only to the nations were they were filed. However, some development was made with the signature of international treaties. These treaties have standards, for example, for how long a patent lasts. The national legislations can provide higher standards for these subjects, but, they cannot disrespect the minimum standards that are contracted in the treaties.

The most important minimum standard that countries must provide deals with the National Treatment principle that consists of providing to foreigners the same treatment as provided to the nationals. IP rights influence the economic markets. Sellers of goods and services are more likely to sell to a country that provides strong IP rights.

IP rights also bring some conflicts between different parts of the world. Developed and developing nations have different ways of perceiving IP.

Developed nations always try to receive full economic benefits from their inventions with strong IP rights. They think that strong IP rights are crucial to protect the immense investment made on the development and creation of these products, for example,

pharmaceuticals products have high costs associated with its development, and creators want a return on their investment. They also argue that strong IP rights will enhance trade because their partners will have the confidence to export the products. Developing nations in the other side argue that they need access to the inventions and knowledge, which are the tools they need to get better development and modernization and its crucial for them to compete. They see strong IP rights as a tool to deny access to technology and knowledge or to restrict access through high prices and royalties that they cannot afford. It seems an open question to know who is right about this.

The oldest and most important international legislation on this subject is the Berne Convention[4] for the protection of literary and artistic work. After the Berne Convention, came the Paris Convention on Industrial Property that was initially signed by 11 countries and after the World War II the signatory members increased[5].

However, this convention lacks the enforcement system required to protect IP. When a country violates a treaty, there is no effective way to punish them. We could, resort to the International Court of Justice; however, no cases have been brought to this mechanism.

Many of these problems were solved through the TRIPs[6] agreement that came with the Treaties of the WTO, it provided minimum standards relative to copyrights, trademarks, geographical indications, industrial designs, patents, topographies of integrated circuits and trade secrets that are mandatory for states to provide in their national legislations. For example: TRIPs prevents WTO members from denying patents in pharmaceuticals and biotechnology issues (this was a problem before the WTO because in the previous treaties there were no requirement for minimum standards and states could just simply claim that for issues of public health, no protection was going to be given to pharmaceuticals products). The TRIPs do have some enforcement mechanisms that provide some protection; however, these treaties are signed between states and not between private entities, this means that fines are going to be applied to member states and no compensation is given to privates.

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[4]Seville, Catherine. ""Copyright and Related Rights"." *EU Intellectual Property Law and Policy* (2009), p.9.

[5] Paris Convention for the Protection of Industrial Property of March 20, 1883.

[6] https://www.wto.org/english/tratop_e/trips_e/trips_e.html , last seen in 25-06-2015. See also*, supra note*, 4 p.17.

Another way of protecting IP rights is the WIPO[7] which currently has one hundred and eighty eight signatory member states, this organization belongs to one specialized body of the UN and was created to promote creativity and at the same time, promote protection of IP rights throughout the world[8].

1.1. The copyright approach

Intellectual property is an asset that has gained through time more and more importance, even more with the rise of the new technologies that give the common user means to easily reproduce many kinds of works[9] that are protected by IP rights.

IP rights are in their nature national in what concerns the scope of application but with the increased globalization in commerce, trade, technology, etc., there was an ever-growing importance in harmonizing the different legal systems.

The European Union and all countries around the world have realized that intellectual property is a huge precursor of economic development and innovation and different approaches have been taken in what concerns the protection of these subjects (in copyright: the "common law and the civil law approach", where the first one gives more emphasis to the economic context and the second one gives more importance to the authors rights)[10].

In what concerns interoperability, we must take into special account the copyright and the trade secret.

Copyrights were born due to the appearance of the printer, which made possible copying in large quantities books that until then were only copied by the few people that knew how to read and write and it was a hard and long work to be made[11]. Since then copyright has

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[7] See, *supra note* 3 pp. 19-23.

[8] http://www.wipo.int/treaties/en/convention/trtdocs_wo029.html, preamble, second paragraph. Last seen in 12-06-2015.

[9] Lévêque, François and Yann Ménière. ""The Economics of Patents and Copyright"." *Berkeley Electronic Press* (2004) p.76.

[10] See, *supra note* 3, p.7.

[11] *Ibid*. p.7.

expanded too many different areas such as the music industry, books, plays, art works, dance, computer programs, films and photography[12].

Copyright unlike patents only protects against the copying of a work but does not protect the ideas embodied in that work, the functionality of the referred work. In order to given copyright protection it must exist originality. According to the Berne convention the work of an author is protected during his lifetime and plus fifty years[13]. However, it could have a longer protection, for example, under European law, the work is protected during the authors life and plus seventy years[14].

With the introduction of the internal market in the EU the free movement of goods, persons, capital and services was implemented. With the freedoms also came many legislative acts to harmonize national legislations, this happened in many fields and IP was not an exception.

As regards copyright we have in the European Union the Directive 2001/29/CE, which aims to harmonize aspects related to copyright and rights related to technological developments to the information society, this directive deals primarily with three main subjects: the reproduction rights, the right of communication and distribution rights.

The reproduction right states that "Member States are to provide for the exclusive right to authorize or prohibit direct or indirect, temporary or permanent reproduction by any means and any forms, in whole or in part"[15] of the respective works.

The right of communication deals with the fact that "Member States are to provide authors with the exclusive right to authorize or prohibit any communication to the public of copies of their works, including the making available to the public of their works in such a way that members of the public may access them from a place and at a time individually chosen by them"[16].

At last, the distribution right deals with the harmonization for authors with the "exclusive right of distribution to the public of their works or copies thereof. This distribution

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[12] See, *supra note* 8, pp.61, 62.

[13] Article 7 of Berne Convention

[14] See, *supra note,* 4 p.58. See also *supra note* 3, p.8.

[15] http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1446042606029&uri=URISERV:l26053 , last seen in 28-10-2015.

[16] See, *supra note* 13.

right is exhausted where the first sale or first other transfer of ownership in the Community of a copy is made by the right-holder or with his consent."[17]

Another important directive is the directive 2009/24/EC Software Directive that deals with the legal protection of computer programs. This began with the 1985 White Paper followed by the Green Paper, the Commission after a public consultation issued one first Proposal and after intense lobbying efforts on the interoperability subject the first consolidated version appeared in 1991 and after some amends we have now the version of 2009[18]. Further development will be made.

1.2. Idea/Expression dichotomy

Before moving one there needs to be made a reference to the idea/expression dichotomy that will give us a background to the analysis of what might be protectable under copyright.

The idea/expression dichotomy is an idea intrinsically linked with the development of copyright framework and with the analysis of what is indeed suitable for this kind of protection. This means that the protection should be given to the expression of the idea and not to the idea itself, the problem is to draw a line that separates these terms and to know exactly where one begins and the other ends.

Article 9/2 TRIPs is a perfect example of such theory *"Copyright protection shall extend to expressions and not to ideas, procedures, methods of operation or mathematical concepts as such."[19]* But as it was said, this is not as linear as it seems because of the labor taken in developing ideas and the costs associated with the creative process that should be taken into consideration when speaking of copyright[20].

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[17] Ibid.

[18] Directive 2009/24/EC of the European Parliament and of the Council of 23 April 2009 on the legal protection of computer programs.

[19] Article 9 (2) TRIPS Agreement.

[20] Rosati, Eleonora. *"Illusions Perdues The Idea/Expression Dichotomy at Crossroads"*. Cambridge: Newnham College, n.d. p.9.

We can say that the ideas that remain the intellect, in the mind of a thinker should not have protection and those ideas that "leave" the intellect of an author and are transferred to a written or material form, to a tangible source could be a candidate to such protection.

In what concerns the new applications of copyright such as in the software market, things have turned even more complicated and the differentiation of the idea/expression is increasingly more difficult. The program code that has the function of giving "orders" to the computer is protected as literary work but the idea of a software, the functions that it performs are not. If there is a software that gives instructions to a computer to make us a cup of tea, the idea of making a computer serving tea is not protected, only the code that constitutes the software, this means that a programmer can create a different code with the same objective (to make a cup of tea).

The choice of the commands and algorithms maybe protected by copyright but the ideas and algorithms themselves are not, interfaces are formed of both copyrightable and non-copyrightable characteristics, the expression of the algorithms chosen maybe copyrightable as in the other hand they have functional characteristics that would be more prone to patent protection than to copyright[21].

It is hard to apply the idea/expression dichotomy because there are no guidelines and no previous situations where there was a need to apply such distinction. Situations can appear in many forms with differing results from case to case. Copyright law should also leave some attention to expressions that can be protectable or non-protectable[22]. The European Union legislation is also very ambiguous when referring to the interface protection.

1.3. Competition Law Focus

1.3.1. Competition Law (Anti-trust)

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[21] Heindl, Petra. ""A Status Report from the Software Decompilation Battle: A Source of Sores for Software Copyright Owners in the United States and European Union?"." *TLF Working Papers* 2008 pp. 9 and 10.

[22] See, *supra note* 18, p.43.

EU competition rules deals with four categories of potentially anti-competitive actions. The first category is the agreements between competitors (Article 101 TFEU); the second category is the abuse of a dominant position (Article 102 TFEU)[23]; the third category is the Mergers (EMCR)[24] and the fourth category is the State Aids (Articles 107-109 TFEU).

The European Commission is primarily in charge of enforcing competition rules, although national courts can also be responsible for the application of such rules.

Initially the main objective of competition law was to build the Common Market. However, through time and with the implementation of the common market and coin, a reform of the purposes was made and competition law gained new purposes. With a new political agenda, consumer well-being and the protection of the market participants is the spotlight of competition law as Professor Pedro Froufe writes[25].

To talk about EU competition law we need first to do an approach to article 101 TFEU.

In article 101(1) we can perceive that only behaviours that distort competition are going to fall within the scope of this provision, and furthermore that behaviour needs to come from an undertaking[26].

Because the provision does not give us a definition of undertaking, this issue was left for the EU courts to decide.

In case "*Hofner and Elser vs Macroton GMBH*"[27] the court of justice held that an undertaking is every entity engaged in an economic activity regardless of the legal status.

What is considered an economic activity? An economic activity is going to consist on the offer of goods or services on a given market (the Pavlov case[28]); organizations that don't have as its main purposes economic motives can be putted in the sphere of this

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[23] Wish, Richard and David Bailey. *"Competition Law"*. Oxford University Press, 2015, p.175.

[24] See, *supra note* 21, p. 829.

[25] Froufe, Pedro. *"A Reforma do Direito Comunitário da Concorrência: O Sentido Descentralizador e/ou Re-Centralizador do Regulamento (CE) Nº 1/2003"*. Braga: Escola de Direito da Universidade do Minho, 2009, p.50 et seq.

[26] For Further development see, *supra note* 21, pp.82-150.

[27] Case C-41/90, Judgment of the Court (Sixth Chamber) of 23 April 1991. - Klaus Höfner and Fritz Elser v Macrotron GmbHCase para 21.

[28] Case C-180/98, Judgment of the Court of 12 September 2000, *Pavel Pavlov and Others v Stichting Pensioenfonds Medische Specialisten.* para 75.

provision. Even if a company is acting as a natural person or under the State authority, they may be found considered undertakings.

Activities that are not economic like: non-profit activities connected with the exercise of powers of a public authority, the professions and employees as trade unions, are also not considered to be in the scope of this provision.

A parent company for all purposes can be considered liable for actions of its subsidiary[29].

Article 101 TFEU is not limited in the field of contracts. The main objective and purpose of these provisions is to eliminate cooperation agreements, decisions and concerted practice that influence and distort competition in the EU level. Article 101 TFEU can be applied to horizontal or vertical agreements (this is, between agreements of undertakings at the same level of market or agreements between undertakings of different levels of the market, respectively). All agreements that have as their objective price fixing, exchanging information on future behaviour, sharing market quotes, limiting outputs, limiting sales, imposing fixed or minimum resale prices, imposing export bans; will be caught by the scope of article 101(1) TFEU. Also, agreements that have as their effects the distortion of competition will be in the scope of the same.

Passing on to article 101(3) TFEU, we can see that there are some exceptions on the application of article 101(1) TFEU.

Article 101(1) TFEU shall not be applied if four conditions are fulfilled[30]. The first two conditions are positive and the last two are negative.

(1) It must contribute to improving the production or distribution of goods or to promote technical or economic progress, (2) while allowing consumers a fair share of the resulting benefit, (3) must not impose on the undertakings concerned restrictions which are not indispensable to the attainment of these objectives, (4) shall not afford such undertakings the possibility of eliminating competition in a substantial part of the products in question.

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[29]Case C-73/95, Judgment of the Court (Sixth Chamber) of 24 October 1996, *Viho Europe BV v Commission of the European Communities.* para 16.

[30] See, *supra note* 21, p.83.

We can perceive that these two articles are of extreme importance to the interpretation of IP rights. These two competition law articles are of great relevance when striking a balance between competition and IP rights.

1.4. Competition and Intellectual Property

1.4.1. Balancing IP and Competition in the EU

The conflict between IP law and anti-trust goes back to the classic contributions of two distinguished authors, Joseph Schumpeter and Kenneth Arrow.

Schumpeter theory claims that the removal of competition and market concentration could eventually lead to better innovation processes and consequently, decrease product prices[31]. This would happen because big companies, large firms, with high market shares, would be in better position and in better economic conditions to spend more in research and development[32].

Arrow, on the other hand, focused on the negative effects that the lack of competition and monopoly companies will have on competition[33].

According to Arrow, a monopolist firm with no market competition will invest less in R&D, by sharing the profits of new technologies with the old ones. If we have companies with competition in the market, those companies are more likely to invest more in R&D to gain market share[34].

Monopolist powers are detrimental to competition and R&D. A monopolist power will have fewer tendencies to increase investment in R&D. The fact is that R&D is a big expense that companies have, it is a big hole in their budget, and if companies could have the same sales of a product without expending resources in R&D they would likely do so. If there are no market competitors, the market share would be absolute, and monopolistic companies

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[31] Czapracka, Katarzyn. *"Intellectual Property and the Limits of Antitrust"*. Edward Elgar, (2009) p.39.

[32] For further development see, McCraw, Thomas K. ""Joseph Schumpeter on Competition"." *Competition Policy International* (2008); and Schumpeter, Joseph A., 1950, *"Capitalism, Socialism and Democracy"*.

[33] See, *supra note* 29, p.40.

[34] For further developments see, Nelson, R. R. *"Economic Welfare and Allocation of Resources to Invention" Arrow, Kenneth J.* 1962.

wouldn't have to worry with the loss of clients to other companies. On the other hand if a company has fierce competition, like Arrow stated, there will be a concern to increase its market share, and to do so, they will need to innovate their products and create new ones, expending more in R&D.

For the purposes of this subject it is important to refer to the authors Baxter, Bowman and Kaplow. These authors tried to give an appropriate balance to the volume of profits that should be made through IP rights.

Baxter believed that profits coming from a patent should be restricted to the patent system, should be confined as narrowly and specifically as possible[35].

Bowman believed that patent owners should have the chance to extract the profits by any means available, as long as the profits come from the superiority and innovative character of the patent, without exceeding the character of the patent[36].

Kaplow has a different approach to the balance of IP profits and anti-trust law. Kaplow suggests that anti-trust rules do not only balance the amount of profit that the patent owners should have but also the way they collect those profits[37]. He argued that IP monopoly rights should be allowed as long as their anti-competitive effects do not exceed the social benefits and do not outweigh the future incentives in R&D. However, he also argues that strong IP rights in conjugation with soft anti-trust laws do not bring high standards of competition to the market. In Kaplow´s eyes competition stimulates innovation[38].

IP law and anti-trust law were created to correct imbalances on the market[39]. IP law was created to incentivize innovation and R&D[40]. IP laws were designed to protect private investors, normally the products of such development are made public (to generate profit), and if unprotected would lead to reproductions from other companies. The problem rises when these companies copy a product with which they didn't had any kind of costs on the development and research, the research and development of a product usually leads to high

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[35] Baxter, William F. ""Legal Restrictions on Exploitation of the Patent Monopoly: An Economic Analysis"." *Yale Law Journal* (1996). See also, *supra note* 29, p.40.

[36] Bowman, Ward S. *"Patent and Anti-Trust Law: A Legal and Economic Appraisal"*. 1973

[37] See *supra note* 29, pp. 41-42.

[38] Kaplow, Louis. ""The Patent-Antitrust Intersection: A Reappraisal"." *Harvard Law Review* (1984)".

[39] Ghidini, Gustavo and Edward Elgar. *"Intellectual Property and Competition Law"*, (2006), p. 99. See also, *supra note* 29, p.36.

[40] Something important for the society evolution and mankind as specie.

expenses: in staff, materials and time[41]. Protecting the investor will give him the opportunity to have returns for the expenses made, and possibly profit.

Intellectual property is something incorporeal, this is: if we eat a steak, it can no longer be consumed by anyone else. What happens with IP is the opposite, if we "consume" a literary work that work can easily be available for a second consumer and so on. Another example to illustrate this situation can be the one of a house: to copy a house, the costs associated will be the costs of building the first house, with IP the situation changes, this is, to produce one book, one music, one film, there needs to exist a certain investment, and to copy this film or book, in the modern world, is very cheap or sometimes with no costs associated. This is the reason why IP should have a certain degree of protection, so that those who make the initial investment can recoup it and make profit.

On the other side, anti-trust laws were created and developed to correct the imbalances of the market, like it was previously explained, these laws prevent the use of strategies that could lead to monopoly situations, cartels, concerted practices etc.

Anti-trust law seeks to increase competition in the market; this competition will probably lead to a gradual decrease of prices to the general population. The opposite happens when dealing with IPR[42]; IPR restricts access to products and may lead to an increase of prices of some products, making them unavailable to many people[43].

High protection in the field of IP could probably lead to negative effects on competition.

EU anti-trust competent authorities, give great concern to the correction of what they consider faulty IP rights. They regulate the amount of profits that an agent should have, taking the excess out and controlling possible detriments to competition.

Many anti-competitive actions from large companies pass through the invalid enforcement and exercise of IP rights, which lead to violations in the competition law area.

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[41] See, *supra note* 1, p.65.

[42] Lowe, Philip and Luc Peeperkorn. ""Intellectual Property: How Special is its Competition Case?"." *European Competition Law Annual* (2005) pp.91-92.

[43] These generates more problems when dealing with products that can be crucial: for health issues for example.

This happens when companies with higher power impede market access through invalid IP rights and licensing agreements[44] that constrict the ability to innovate[45].

The balance between IP rights and anti-trust law is a delicate subject[46]. It is well known that protective anti-trust laws cause detrimental effects to innovation as well as to R&D. No company would spend high amounts of money, if they then were faced with their rivals copying their products without punishment. On the other hand, if higher protection is given to IP rights and soft lenient anti-trust laws are in place, large companies are likely to impede other market players to enter or compete in the free market. A balance must be made between these two areas[47]. The author believes that anti-trust authorities should give guidelines to the admissible profit that one company should take in comparison to what was spent in the development of such product; they should also ascertain how those profits are claimed. We also cannot forget that nowadays the interoperability of products is crucial and many times one IP right can close the market for other competitors in similar areas of operations[48].

The *Microsoft* case is a good example on how the authorities interfered in a IP rights situation that was detrimental to competition.

Microsoft did not disclose interoperability information of their PC operating system, crucial for internet browsers to function well. In the same time, *Microsoft* created an internet browser (*Internet Explorer*) that benefited from that interoperability mechanism with the operating system. Microsoft had the dominant position in the market of operating systems. Using that advantage of dominant position in the market to "sell" another product that was not an operating system but instead an internet browser, leaving aside the other internet browsers. The Commission ruled in favour of the other browsers, obliging *Microsoft* to disclose interoperability information so that other internet browsers could gain access to the market[49].

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[44] Begoña, Gonzalez. ""Compelling Disclose Software Interoperable Information" volume 16." *The Journal of World Intellectual Property* (2013)" pp. 6-9.

[45] Scotchmer, Vid. S. ""Innovation and Incentives"." *MIT Press Cambridge* (2004)", p. 134.

[46] See, *supra note* 29, pp.37-38.

[47] See, *supra note* 37, p. 104.

[48] Ibid. pp. 104-106.

[49] Case T-201/4, Judgment of the Court of First Instance (Grand Chamber) of 17 September 2007, *Microsoft Corp. v Commission of the European Communities*.

The European Union approach in what concerns the new technology market is one of reluctance and control. The Commission focuses its attention mainly in the vertical integration and in the defective providence of the interoperability information's required for other competitors to enter in the market. Dominant companies are not required to disclose interoperability information of its systems, however, when the access to that interoperability is used to gain market power in another field or market, it will probably be considered an anticompetitive measure[50]

The technological market is a market that raises problems with the balancing of IP and anti-trust, this because within the technological market we usually have one or two companies that are dominant and many times they are likely to gain access to other markets through their dominant position, restraining the access to other competitors. The intervention of the Commission in the authors' perspective is at the moment necessary to control the market failures. A problem can arise because dominant companies are going to be obliged to disclose their technology to rivals; this could possibly lead to a decrease of research and development, and could act as a disincentive.

1.4.2. Vertical Restraints

The IPR owners have the characteristic of having the right to contract with companies the price and impose terms on exploitation and selling conditions, as well as restraints and refusals to deal.

The European Commission views the price restraints in licensing distributions agreements with a certain suspicion and most likely these agreements are going to fall within the scope of article 101 TFEU.

However, since the late 1990s the Commission liberalized the application of article 101(3) giving greater flexibility on the interpretation of these types of contracts, it was recognized that these contracts could have a positive impact on competition.

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[50] See: "*Antitrust: Commission confirms sending a Statement of Objections to Microsoft on the tying of Internet Explorer to Windows*", at: http://europa.eu/rapid/press-release_MEMO-09-15_en.htm last seen in 23-06-2015.

In what concerns these vertical agreements the first block exemption appeared in 1984 with the block exemption[51] related to IP licensing[52]. The Commission created the "white list" containing the clauses and situations that did not constitute violation of article 101(1) [previous article 81(1)], and the "black list" which referred to the situations that were not allowed.

In 1996 the Commission created the Technology Transfer Block Exemption Regulation (TTBER)[53] and there was a larger flexibility, giving an extensive list on "white clauses" and shorter list of "black clauses".

In 2004 there was a reform of the TTBER, striving for an economic approach rather than a formalistic one. With this reform the "black list"[54] was again reduced and shortened. This does not mean that resale price fixing is now considered a "white clause", on the contrary, it is considered to be a "severely anticompetitive restraint"[55]. A company doing this type of agreement can always come before the Commission and claim that the agreement has pro-competitive effects, however, the burden of proof will fall in the scope of the company and it will be a very difficult task to convince the Commission of those effects.

There is more and more a need to approach these subjects and make a good balance between IP and anti-trust with an economic mindset in order to achieve the total potential in innovation and R&D and at the same time protect consumers from monopolistic entities that only function to the detriment of competition. Philosophical approaches are out of date and pragmatic ones are the most relevant to the function of the market.

From what it was said, one could think that IP and Competition are conflicting areas with different interests, however, when analyzing this subjects in a higher level, we easily realize that these two areas do pursue the same objectives. Both want to enhance consumer welfare and incentivize R&D as well as innovation, the difference here is when these incentives are made. IP gives incentives in an ex-ante regime and Competition gives incentives in an ex-post regime.

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[51] See, *supra note* 21, p.640-645.

[52] Commission Regulation 2349/84 of 23 July 1984. See also *supra note* 21, pp. 617-626.

[53] Commission Regulation (EC) No. 240/96 of 31 January 1996.

[54] See, *supra note* 21, pp. 159-172.

[55] See TTBER, Recital 13 and Article 4 and also Technology Transfer Guidelines.

IP is directed to, in a first instance incentivize R&D investment: it states what is and what is not protected, it gives security to the investor, it says to the investor that he will be able to recoup the investment made and possibly make a profit and if someone tries to free-ride he will not be successful (it's a previous stage, a legislative stage). In the other hand we have competition laws that are the ex-post incentives; this ex-post approach is individualized and is made case-by-case, it is in fact more accurate but also more expensive and time consuming due to the formalities that courts are attached to. Both give protection but in distinct levels and with distinct characteristics[56] (this issue will be further addressed).

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[56] Roijen, Ashwin Van. *"The Software Interface Between Copyright and Competition Law, a Legal Analysis of Interoperability in Computer Programs"*. Kluwer Law International, 2010, p. 103 sq.

Chapter II

Interoperability

1. First approach to Interoperability

1.1. Interoperability Context

Interoperability in the technological world is a subject of great controversy, even more the lack of it. Interoperability is the ability of a product to connect with other products through the exchange of information[57]. Our PCs are subject to hundreds of interoperability connections, between the hardware, the software and the innumerous applications that we have the ability to install. Interoperability can be vertical or horizontal, horizontal interoperability exists in the same PC as it was previous described and vertical interoperability is the communication between different operating systems[58].

The horizontal interoperability is used to create a new operating system that would be compatible with the existing application programs. Vertical interoperability is normally used by application program developers to interoperate with the dominant software providers. Software providers will tend to disclose vertical interoperability information's and keep in secret horizontal interoperability information's[59].

In the commercial market enterprises normally evolve independently from their rivals, but in the technological world this is not what happens. Let's think for example in a computer game, the creator of the computer game needs to gain access to the interoperability interfaces of the operating system so that the game can run in perfect conditions, without this ability to exchange information the game would not run.

The technological market has a special appreciation in what concerns networking[60], let us now think about the smartphones, it is well known that there are only two main suppliers of operating systems, and those are *iOS* and *Android*. If we want any kind of application for our smartphones we go to the respective "stores" and we have a wide variety of apps, for both of them.

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[57] See, *supra note*, 40 p. 3.

[58] See, *supra note* 19, pp. 33-37.

[59] Ibid. p. 36.

[60] See, *supra note* 29, pp. 81-82.

Now let us imagine that an enterprise that produces operating systems for smartphones wants to enter in the market and let us name it "*newos*". *Newos* is free to enter in the market, the problem here is that all those thousands of apps that are now available for *iOS* and *android* will not be available in the *newos* store and consumers are reluctant to change from the security that *iOS* and android nowadays provide. Consumers already know how the operating systems work and they know that they have available thousands of apps in their respective stores. Networking in the technological market is appealing for consumers and undertakings.

The technological market is many times controlled by few dominant companies that if not controlled can disrupt competition, R&D and innovation. If interoperability information is not provided for those who want to create a new product in the downstream markets it could lead to vertical restraints and foreclosure of an entire market[61], giving indirect monopoly in the downstream market to companies that are dominant in the upstream market.

The IP laws as well as competition laws are ill suited for the fast development of the technological market; this because IP and Competition many times prohibit the disclosure of vital information's and cooperation between competitors, this way of thinking goes against the fundamental need of interoperability in the new technologies. "Sharing among competitors is not warmly embraced by these laws"[62].

However, looking at the telecommunications law of the EU[63] we can perceive that advances have been made in some areas that welcome and embrace the interoperability and maybe, if comparing the legislation approved in this area we could take some ideas to develop a special legislation to the IT market.

1.2. Technical Terms

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[61] See, *supra note* 40, p.5.

[62] See *supra note* 52, p. 10.

[63] Directive 2002/21/EC of the European Parliament and of the Council of 7 March 2002.

Software: software is the set of instructions that make the hardware work, transforming the useless machinery into the interactive tool that we are all so used to[64]. The most well known with the general public are: *Mac*, *Windows* and *Linux*. These are the operating systems, the software. We can then have other type of software, the applications programs, these programs are for example: the internet browsers that we use to access internet, the media players, the word programs (*Microsoft office word* and *Pages*), among others.

The operating system has many times the job to connect these application programs to the hardware, it has the job to link the machinery to the application program, and these application programs many times are developed by companies that have nothing to do with the company that developed the operating system per se. However, the distinction between application program and operating system is sometimes unclear and hard to define[65].

A computer program can only read binary code, this is, it can only read ones and zeros, and this is called the *object code*, but this type of code is unreadable for humans. The programming language was than created, this is, the object code is transformed into *source code* (written orders and commands) that is human readable[66]. For example, to shut down your PC (if you have the *windows* operating system), you can write "shutdown/r/o" and this written command in English has behind it an object code that is composed by a binary code of ones and zeros that communicates and gives the order to the computer to shut down[67].

The operating system is not distributed in source code, it is distributed in object code and as Dr. Ashwin van Roijen wrote, source code is many times compared to a recipe, "one may enjoy a dish prepared according to a recipe that cannot easily be extracted from the meal"[68]. But unlike the recipe we can extract the source code from the object code that we have access by decompiling, and this is the act of reversing the object code into readable

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[64] See Directive 2009/24/EC para. 10. "Reverse Engineering of Software for Interoperability and Analysis." *Vanderbilt Law Review* (1994) p. 149. *Supra note* 19, p.7.

[65] Case Comp/C-3/37.792, EC Commission v. Microsoft pp. 800-813.

[66] Samuelson, Pamela, Thomas Vinje and William Cornish. ""Does Copyright Protection under the Software Directive Extend to Computer Program Behaviour, Languages and Interfaces?"." *European Intellectual Property Review* (n.d.). p.159. See also "Reverse Engineering of Software for Interoperability and Analysis." *Vanderbilt Law Review* (1994) pp. 149-50.

[67] See, *supra note* 19, pp. 7 and 8.

[68] See, *supra note* 52, p. 12.

source code. Usually the source code is not open; however the operating system Linux does have an open source code.

Interoperability is achieved through access to the interface. Interface in the computer sciences is the point where control between two devices is achieved, between the user and the operational system, between the hardware and the application programs or between two applications. The interface in the hardware are the physical connections that make the bridge between two devices, a perfect example is the USB connections that we are used to. Interfaces in software systems are called APIs (application program interfaces) and the APIs are basically codes and messages used by programs to communicate among them[69]. For this purpose we can look at Directive 2009/24/EC:

"(10) The function of a computer program is to communicate and work together with other components of a computer system and with users and, for this purpose, a logical and, where appropriate, physical interconnection and interaction is required to permit all elements of software and hardware to work with other software and hardware and with users in all the ways in which they are intended to function. The parts of the program which provide for such interconnection and interaction between elements of software and hardware are generally known as 'interfaces'. This functional interconnection and interaction is generally known as 'interoperability'; such interoperability can be defined as the ability to exchange information and mutually to use the information which has been exchanged."[70]

APIs are divided into two: the interface *specification* and the interface *implementation[71]*. The interface specification is embodied in the object code of the program and it says how to interact with the program in question. The interface implementation is the practical part of the interface, it is the part of the interface that makes the interoperability with other programs, one is the theory and the second is the practice.

The problem here is that the IT market has already said, is normally dominated by one or two companies that become the standard in their product (like Windows and Mac), and if

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[69] See, *supra note* 19, p.34.

[70] See, *Directive 2009/24/EC*.

[71] See, *supra note* 52, p. 15.

there is no access to the interfaces of these two operating systems there will be no chance to enter in the downstream market. Remembering the Microsoft case we can see that the lack of interoperability closed a downstream market.

One way of getting access to the interfaces interoperability is through *reverse engineering*[72]. Reverse engineering can be explained through the recipe example. One can eat a very tasty meal prepared by a famous chef and realize that the recipe has vinegar, salsa, salt, pepper, cheese, etc. and knowing that, the person can go home and try to reproduce the recipe, however, that person does not know how the meal was prepared, he doesn't know the dosages of the ingredients, for how long was the steak cooked, and even if it was used any special ingredient that escape his analysis.

It can also be seen as "going backwards through the development cycle"[73]. We can have two types of reverse engineering, in the first situation, the programmer has access to the source code that is already available in the operating system, but the higher level aspects are not known[74]; in the second situation, there is no access to the source code and the discovery of the source code is made through the object code. This last method is a mechanical method. The first method is called the black box[75] method and it consists only in observing how the program works, the programmer knows what the software does but he does not know how it was done. It's a method that looks at the functionality but does not peek into the internal structure.

The programmers can make use of the *clean room* technique; this is a way of copying a design without infringing copyright and trade secrets associated to the product[76].It is sometimes called clean room design because engineers reverse engineer the program giving it a different aspect (avoiding copyright infringements).

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[72] Samuelson, Pamela and Suzanne Scotchmer. *"The Law and Economics of Reverse Engineering*. n.d. p.27. See also "Reverse Engineering of Software for Interoperability and Analysis." *Vanderbilt Law Review* (1994) pp. 150-154. See also Band, Jonathan and Masanobu Katoh. ""Interfaces on Trial 2.0"." *The MIT Press* (2011)" pp. 18-19.

[73] Warden, R. *"Software Reuse and Reverse Engineering in Practice"*. London, England: Chapman & Hall, 1992. pp. 283-305.

[74] "Reverse Engineering of Software for Interoperability and Analysis." *Vanderbilt Law Review* (1994). p. 151.

[75] See, *supra note* 62; p.161. See, *supra note* 40; p.4. See also *supra note* 19, pp. 56-59.

[76] For further development see: Deck, Michael. ""Cleanroom Review Techniques for Application Development"." *International Conference on Software Quality"*. 1996.

Now, one can ask about the legality of reverse engineering[77]. The answer is in Directive 2009/24/EC (on the legal protection of computer programs). Reading the directive we can easily perceive that the unauthorized reproduction or transformation is unlawful except when it is made to gain interoperability access. The knowledge acquired by reverse engineering cannot be used to compete in the horizontal market; this is, to compete in the same market as the product that suffered the reverse engineering technique.

Directive 2009/24/EC paragraph 15 reads: "The unauthorized reproduction, translation, adaptation or transformation of the form of the code in which a copy of a computer program has been made available constitutes an infringement of the exclusive rights of the author. Nevertheless, circumstances may exist when such a reproduction of the code and translation of its form are indispensable to obtain the necessary information to achieve the interoperability of an independently created program with other programs. It has therefore to be considered that, in these limited circumstances only, performance of the acts of reproduction and translation by or on behalf of a person having a right to use a copy of the program is legitimate and compatible with fair practice and must therefore be deemed not to require the authorization of the right-holder. An objective of this exception is to make it possible to connect all components of a computer system, including those of different manufacturers, so that they can work together. Such an exception to the author's exclusive rights may not be used in a way which prejudices the legitimate interests of the right-holder or which conflicts with a normal exploitation of the program."[78]

Article 6/3 of the same directive states: "(3) In accordance with the provisions of the Berne Convention for the protection of Literary and Artistic Works, the provisions of this article may not be interpreted in such a way as to allow its application to be used in a manner which unreasonably prejudices the right-holder's legitimate interests or conflicts with a normal exploitation of the computer program."[79].

Decompilation is another way of achieving interoperability but this is a more mechanic way and not only an observation method (as the black box). This method tries to

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[77] For further development see Band, Jonathan and Masanobu Katoh. ""Interfaces on Trial 2.0"." *The MIT Press* (2011) chapter 1.

[78] See, Directive 2009/24/EC.

[79] Ibid.

obtain the source code of a program through the object code, however, this mechanic way to obtain the source code is not very accurate and this is a way to complement the reverse engineering process[80]. The terms to use this method are explicit in article 6 of the Directive 2009/24/EC. The legal terms to use the Decompilation are almost the same as the ones for reverse engineering (already mentioned).

1.3. Interoperability and Intellectual Property (the copyright approach)

As explained before, computer programs are formed by a binary code, the object code that than is legible by transforming it into perceivable language for humans, the source code. The way that was found to protect software was through copyright, which protects unique expressions of ideas. It is protected as a Literary Work, it protects the source code the written part of the program and not the real function of the program, and it does not protect the underlying idea[81].

1.3.1. Interfaces

The Berne Convention and other international agreements have the objective to give a higher level of protection to software programs since they have become products of great relevance in our modern society. The way that was found was through copyright protection. Copyright was a way to solve an immediate problem, there was a need to give higher protection to software in order to promote the development of the same[82]. Copyright has we saw, does not protect the ideas, the expression and the functionality[83] of the software[84]. However, it was not considered a problem since other literary works such as maps were protected through copyright laws and the functionality of the same were not. Copyright laws do have an advantage, there is an international acceptance of what should or should not be

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[80] Samuelson, Pamela and Suzanne Scotchmer. *"The Law and Economics of Reverse Engineering*. n.d. p. 28.

[81] Samuelson, Pamela. *"Why Copyright Law Excludes Systems and Processes from the Scope of its Protection"*. Texas: Texas Law Review, 2007 p.2.

[82] See, *supra note* 8; p.79.

[83] Ibid. p.67.

[84] The form (the way) it is presented to us.

protected as copyright and the level of protection is in some way standardized across the world. The will to solve a first instance problem did create a second instance problem, the interface protection and availability as well as accessibility.

We already saw that software is protected by copyright and we also saw that for interoperability to be achieved, there needs to be granted access to the interface of the program. The question here, is, if the interface is also protected by copyright? The answer is not certain, there is a big possibility for the programmer to protect the interface through copyright since the interface is also made from source code and respective object code. But if we consider the interface as an idea and not the expression of the program, something tangible, the copyright laws do not cover the interface.

A problem that rises here is the one of filling the originality test. For a work to be original it must come from the authors independent creation and originality[85], the problem is that interfaces do have standardization requirements, this is, if we visit the ISO website[86] we can perceive that interfaces are standardized[87] and, the originality requirement can fall, leaving the interfaces unprotected. However, different programmers can indeed give the same functionality to an interface using different program writings, different source codes and object codes.

Interface codes can be considered part of the software and thus, being protected by the same copyright laws that protect the software. There seems to exist a dichotomy, because interfaces can be protected through copyright if considered part of the software but they can also have a lack of originality due to the standardization requirement, and if there is no originality they cannot be protected by copyright.

The Berne convention does states that the written code is the one that has the ability to be copyrightable and it seems that being the interfaces written codes they are able to be copyrightable. It also seems that the interface, being part of the operating system can be copyrightable. Interfaces are constituted by source code, and this source code even if it's not completely original, is part of an even bigger source code that is protected by copyright and this brings us serious problems when analysing the right to achieve interoperability.

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[85] See, *supra note* 8; p.61. See also, *supra note* 19; pp.10-15.

[86] http://www.iso.org/iso/iso_catalogue/catalogue_ics/catalogue_ics_browse.htm?ICS1=35&ICS2=200 last seen in 02-11-2015.

[87] See, *supra note* 40; p. 2.

The EU Software Directive leaves also room for different interpretations, giving that the originality threshold is very low. Requiring only to be the authors' intellectual creation.

2. Software directive and the Interoperability Question

To better understand what was said above we need to look at the Software directive (directive 2009/24/EC) and see what the legal means are, how they give protection to interface, and what the consequences are in competition terms.

The software directive was created in order to solve some problems with the IT fast growing development. One of those problems was the interoperability and access to interfaces. Despite being a good legal evolution it is not enough and an ex-ante protection to software developers wasn't given in the desired level, it fell short from the initial objectives. It left much of that desired protection to the ex-post protection (the court decisions)[88].

Article 1(2) of the Software directive states: "Protection in accordance with this Directive shall apply to the expression in any form of a computer program. Ideas and principles which underlie any element of a computer program, *including those which underlie its interfaces, are not protected by copyright* under this Directive."

To ascertain if protection can be granted to interfaces, we should go back to the definition of interfaces and how they are divided, interfaces are composed by the interface specifications, the written part of the interface, and the interface implementation that is, the practical part of the program, the expression, and that can be protected by copyright according to the Software directive. However, it is not of our interest to analyze in depth the interface implementation since the interoperability is achieved by the interface specifications. The interface specification is composed by object code, a number of codes and messages that make the bridge and connection with other programs[89].

We already saw that object code is not legible for humans, it is only legible by machines like computers, and this brings us the question if something that is not legible by

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[88] See, *supra note* 19; pp. 37-39.

[89] See, supra note 70 pp. 150-154; 173.

humans should be protected as literary work, under the copyright laws. Article 1 (3) of the proposal for a directive states:

"The algorithms which go to make up the sub-routines are not normally in themselves capable of receiving protection under copyright. Insofar as they are similar in nature to mathematical formulae, they may in exceptional circumstances attract patent protection. Similarly, the ideas, principles, or logic which underlies the program will not be copyrightable."[90]

This article taken from the proposal for the protection of computer programs can direct us into perceiving that the algorithms are not protected under copyright law, leaving some space to facilitate the interoperability and access to interfaces. However, it did give another way of protecting it, through patents, but, as we already saw, there is not much space to originality in what concerns interfaces, leaving aside the possibility of applying for a patent[91].

A patent is best suited to protect things that perform a function, and this is the case, the interface does perform a function, the function of interoperability with other programs, a patent also requires usefulness (not a problem) and novelty, and here is where the problem lies, it would be very difficult to prove the novelty of a certain interface, even if the object codes are different and new, the function of the interface would continue the same.

We have in recital 11 of the Software directive that: "For the avoidance of doubt, it has to be made clear that only the expression of a computer program is protected and that ideas and principles which underlie any element of a program, including those which underlie its interfaces, are not protected by copyright under this directive. In accordance with this principle of copyright, to the extent that logic, algorithms and programming languages comprise ideas and principles, those ideas and principles are not protected under this directive. In accordance with the legislation and case-law of the Member States and the international copyright conventions, the expression of those ideas and principles is to be protected by copyright."[92]

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[90] Proposal for a Council Directive on the legal protection of computer programs, 1989; Article 1(3).

[91] See, *supra note* 70; p. 150.

[92] See, *Directive 2009/24/EC*; recital 11.

This seems to go in line with the Proposal for a directive, algorithms and programing language is not protected under the Software directive only the expression of those ideas are, but not the ideas itself.

In case *Navitaire v. Easyjet*, we have a decision that could give us further understanding about this subject.

It was brought by *Navitaire* an action against *BulletProof* and *Easyjet* due to alleged copying of computer software. *Easyjet* had a license for an airline reservations software *(OpenRes)* owned by *Navitaire* and licensed to *Easyjet*. *Easyje*t hired another company to create a software for airline reservations with the same functions of the program *OpenRes*. Mr. Justice Pumfrey accepted that could exist a copyright infringement if the idea was something very specific, but he was unwilling to consider in this case that there was an infringement, because there was no violation of the work *per se*, the labour and skill.

Paragraph 86 writes: "I consider that the better approach is to take the view that it is not possible to infringe the copyright that subsists either in the source code for a parser or in the source code for a parser generator by observing the behaviour of the final program and constructing another program to do the same thing. In expressing this view, I am verging on drawing a distinction between the 'idea' of the program and its 'expression' (…)"[93]

He also referred to an example that could better express the situation and explain it in simpler terms. He thought of a chef that creates a new pudding, he writes the recipe in a paper and thereafter he uses the same recipe to create that pudding, the recipe is in fact a literary work. Along comes another chef, he tastes the pudding and after much hard work and many attempts he creates the same pudding. Is this last chef infringing the first chef copyrights? In the opinion of Mr. Justice Pumfrey; no he is not.[94]

Mr Justice Pumfrey relied on the TRIPs agreements and WCT to explain the consensus on the non-protection of ideas and methods of operation[95]

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[93] Case Naviataire vs easyjet airline company; Royal Court of Justice; Para 86.

[94] See, *Case Navitaire vs Easyjet*; para 127.

[95] WCT art. 2 and TRIPS art. 9(2).

The problem here is that there is an acceptance that the interface specification is not the expression but the idea, being the idea, it is not protected under the directive and subsequently is not copyrightable.

If there was a consideration in the opposite way, this is, if the interface specification would be considered expression and not the idea, we would have to fill the criteria of originality, looking at article 1(3) of the Software directive:

"A computer program shall be protected if it is original in the sense that it is the author's own intellectual creation. No other criteria shall be applied to determine its eligibility for protection."

This article gives a required level of originality very low, it only requires being the authors own intellectual creation and it removes any other criterion to ascertain if originality is or is not present in the creation.

2.1. Methods to Gain Access to Interfaces

Through the analysis of the Software directive we can perceive that for interoperability purposes some solutions were created, despite being few and not very effective. What it was intended was to create a balance between the owners and the competitors. Recital 15 states:

"Circumstances may exist when such a reproduction of the code and translation of its form are indispensable to obtain the necessary information to achieve the interoperability of an independently created program with other programs. It has therefore to be considered that, in these limited circumstances only, performance of the acts of reproduction and translation by or on behalf of a person having a right to use a copy of the program is legitimate and compatible with fair practice and must therefore be deemed not to require the authorization of the right-holder. An objective of this exception is to make it possible to connect all components of a computer system, including those of different manufacturers, so that they can work together."[96]

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[96] See, *supra note*; 16.

We can perceive that there was a concern to provide a solution for interoperability between different software's even if they originate from competitors and different manufacturers.

The directive provides, according to article 5(1), 5(3) and 6 the possibility of reverse engineering.

We already saw that there are two types of reverse engineering, that complement each other, the first one is the *black box*[97] method that consists in analyzing from the outside what the program does but not knowing how it does it[98]. The second method, *decompilation*[99], is a more intrusive and mechanical process that tries to obtain the source code through the object code provided with the software[100]

Article 5(1) and (3) provides the legitimacy to engage in the first method of reverse engineering, the black box process. Article 5(3) states: "The person having a right to use a copy of a computer program shall be entitled, without the authorization of the right-holder, to observe, study or test the functioning of the program in order to determine the ideas and principles which underlie any element of the program if he does so while performing any of the acts of loading, displaying, running, transmitting or storing the program which he is entitled to do."

We can see that there is a legitimacy to observe study and test the software to gain knowledge on how the program works; we already saw that the ideas underlying the software are not protected by copyright, only the written part. It is not surprising that it would be permitted to analyze a certain computer program in order to perceive the functionality of the same.

However, interoperability is hardly achieved by the black box method; decompilation is a complementary part of the reverse engineering process. Decompilation[101] is also covered in the Software Directive, more precisely in article 6, and this process does have more restraints.

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[97] For further development see, Directive 2009/24/EC; pp. 56-59.

[98] See, *supra note* 62; p.159.

[99] Ibid. p.161.

[100] For further development see, *supra note* 19; pp. 23-31.

[101] See, *supra note* 40; p.4.

Decompilation has we saw is a mechanical method that tries to obtain the source code through the provided object code (illegible for humans). To engage in decompilation there is a need to reproduce the program and make copies, and indeed, when trying to achieve interoperability, the reproduction of a computer program is allowed by article 4 of the directive.

When decompilation is done and the desired results are achieved, we can expose Know-how that was used to create the software[102], and this know-how many times has more economic and technological relevance than the original expression of the program[103] and this is why article 6 of the directive makes some exceptions and imposes limits in the decompilation method[104]. First of all, article 6(1) (c) states: *"those acts are confined to the parts of the original program which are necessary in order to achieve interoperability."* There is here a limitation only to proceed with the decompilation within the strictly necessary to achieve interoperability.

In second place, article 6(2) states: *"The provisions of paragraph 1 shall not permit the information obtained through its application: (a) to be used for goals other than to achieve the interoperability of the independently created computer program."* There is a reinforcement of the idea to protect the right-holder`s rights[105].

The use of information obtained through decompilation cannot be used for other purposes other than to achieve interoperability[106], this means that Know-how acquired during the decompilation of the object code to source code cannot be used; however, this seems somehow unrealistic. After acquiring knowledge of something it is practically impossible to remove the knowledge from the person mind[107].

Article 6 (3) of the Software directive ensures that decompilation exceptions shall not be "used in a manner which unreasonably affects the right-holders legitimate interests or conflicts with a normal exploitation of the computer program". This article was introduced to

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[102] Ibid. p.3.

[103] See, *supra note* 52; p. 83.

[104] See, *supra note* 3; p.29.

[105] See, *supra note* 62; p.161.

[106] "Volume 20." *Rutgers Computer and Technology Law Journal* (1994), pp. 335-337.

[107] For further development see, *supra note* 19; p. 51.

ensure the compliance of the European directive with the Berne convention and the three-step test[108].

The three-step test of Berne convention applies three cumulative sets for granting an exception for the reproduction rights: In certain special cases; provided that they do not conflict with a normal exploitation of the work; provided that they do not unreasonably prejudice the legitimate interests of the authors[109].

It seems that the objective here is to pressure the right-holder and the competitor to engage in licensing agreements. On one hand we have the possibility of the competitor to gain access to more than interoperability, to gain access to the business secret, to valuable Know-how, and one the other hand we have the costs and time consuming process of reverse engineering and its delimitations.

It would be more favourable for the right-holder to impose a date on which he would disclose the interoperability information, let us say, in one year and it would be more favourable for the competitor to wait that year of standby if the time required for all processes of reverse engineering would consist for example in two years.

In what concerns the costs associated with this commercial transaction, it could be favourable for both parties, in one hand we have the right-holder that gains time advantage (one year with no competition) as well as the revenue from the licensing agreement and on the other hand we have the competitor that doesn't have to spend money in the reverse engineering process and only has to pay the costs associated with the licensing agreement.

Something that was not taken into account when formulating the Software directive was the balancing of interests between the right-holder and competitor. In a first instance, we don't have any legitimate way of obliging a right-holder to disclose interoperability information, articles 5 and 6 of the Software directive are only a legal way of trying to achieve interoperability, however, even if engaging into the reverse engineering process, there is no certainty of achieving interoperability with the decompiled software.

Another aspect is the fact that technology evolves every day, and decompilation processes depend on mechanical processes, these mechanical processes will eventually

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[108] Article 9 (2) Berne Convention.

[109] Article 9 (1) and (2) Berne Convention. See also, *supra note* 19; p. 41.

evolve, making the decompilation process faster and cheaper. If the decompilation process becomes so cheap that is not worth engaging into commercial negotiations with the right-holder, the right-holder will be in a disadvantageous situation, not benefiting from the time advantage (where the right-holder has the monopoly of the technology) and not gaining anything from the licensing agreements.

Other problem can rise, with the decompilation processes evolution, generating a problem of Know-how discloser that is embedded in the source code. One way those right-holders may have to overcome this disclosure may be through article 6(1) (b) of the Software directive that states: *"the information necessary to achieve interoperability has not previously been readily available"*. This tells us that if the information is readily available for the competitor to achieve interoperability, the competitor cannot engage in the process of decompilation[110]. Other problem appears when analyzing this sentence, and that is to know what is the amount of readily available information that needs to exist in order to prevent the decompilation process. The Directive does not explicitly states, leaving this problem to be solved in an ex-post situation.

It needs also to be said that article 6 (2) (b) of the Software directive prohibits competitors from coming together in order to support the cost with the reverse engineering process. This limits the process of reverse engineering to the richest companies, to the companies with funds available to invest in this process. (*"Shall not permit the information obtained through its application: (b) to be given to others[111]"*). This let us perceive that small and medium companies of this field can eventually be forever set aside from the competition process. The directive, in practice does not provide access to interoperability information to small and medium companies.

Companies that rely on interoperability to continue their business do not have any cost effective solution, this is, either they try to reverse engineer the program (something very costly and uncertain), or they try the ex-post solution, the courts solution, a solution that is also very damaging in terms of time and money.

Other problem that is also unaddressed by the directive is the possibility of the right-holder`s to change the interface specifications at any time, if a company wants to decompile

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[110] See, *supra note* 19; p.62.
[111] See, Directive 2009/24/EC.

the program spending time and money in the process, they should have at least a legal certainty to use the decompiled information's in the future, this leaves great uncertainty for the decompilation process. If a company successfully decompiles a program it could be required to do it again for the same program engaging in new costs for the exact program[112].

2.1.1. Economic perspective of Reverse Engineering

The primary reason to enter into a reverse engineering process is to create a competing product or to achieve interoperability with a certain program. Reverse engineering is a time-consuming process and also very costly. If an application developer wants to make a product to run for example on the Windows operating system it must have access to the APIs. Some of the software developers publish the interfaces in a public way, others license them and others will maintain the interface information's as trade secrets[113].

Keeping the interfaces as a secret can give the software owners control over the applications, in this case, making an non-interoperable program it can go both ways, if consumers and applications developers do not find the software attractive, it can mean high losses, however, if the software turns out to be attractive it could lead to a snow-ball effect where the increasing network effects turns the software and the interface into a *de facto* program in the market.

Reverse engineering came to menace the strategy of non-interoperable software developers since they do not need the authorization or license contracts from the software owner. The idea of turning the reverse engineering process lawful seems the one to give software developers higher incentives to license the access to interfaces, this is because if software developers do not license and the applications developers reverse engineer the program they will not gain any income[114] and in the other way, if they do license, the program developers taking into account the time consuming and costly process that is to reverse engineer a program will be more prone to accept the license agreement.

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[112] See, *supra note* 76; p. 36.

[113] Ibid. p. 34

[114] Because there was no license agreement.

In the software industry the power comes from network effects, this means that the more applications are available to a certain software more users it will attract, and when a software has a high amount of users, it will attract more applications developers.

Non-interoperability and incompatibility between two software developers may lead to higher competition between them and in a short term it will be positive for consumers, leading to better prices but in a long term it could give a monopoly to the winner and consequently increase in prices to make up for the stage were the competition between the software developers was fierce[115]. A legal balanced rule on reverse engineering can give economic benefits for users, software developers and program developers.

3. Interoperability under scrutiny of Competition Law

The intervention of competition law in matters of IP is restricted to some exceptional cases. Competition and IP laws do have the same objectives; both of them want to enhance market efficiency, both want to increase dynamic efficiency (innovation) and static efficiency (price competition)[116].

Like the name suggests, competition law deals with the competitive process between companies, this area has the objective to regulate, prevent and judge the competitive processes in order to raise consumer welfare.

When analyzing articles 101 and 102 of the TFEU we can perceive that there is a clash in what concerns the openness of interoperability information's to other enterprises. For example, article 102 (b) of the TFEU states: *"Such abuse may, in particular, consist in: (b) limiting production, markets or technical development to the prejudice of consumers"[117]*. If a company does not disclose its interoperability information's to another company with a new and innovative technology we could argue that the first company is limiting the market and technical development and it prejudices consumers. When a company owns dominant software on a horizontal market and does not discloses interoperability information's, it could

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[115] See, *supra note* 76; p. 40.

[116] Drextel, Joseph and Annete Kur. *"Research Handbook on Intellectual Property and Competition Law"*. Edwaard Elgar , n.d, p. 326.

[117] Article 102 TFEU.

be closing secondary, vertical markets[118]. Sometimes, new technologies appear with the intention of competing in a vertical market, but for that, they need to gain access to interoperability information's.

When talking about competition law and IP laws, there is a common ground that is the enhance of consumer welfare and market efficiency, however, there is some predisposition on IP laws to constrain the static efficiency due to the ability of a right-holder to increase the prices of a certain product of which he has the monopoly. IP laws, constrain static efficiency but increase dynamic efficiency on promoting the innovation, this because, there is a protection given ex-ante that secures the economic returns of the research and development made to develop the product. The opposite happens in competition law, where there is a predisposition to increase the static efficiency (the competition between companies in terms of product prices. Where there is more price competition lower prices will appear)[119].

There needs to be said that competition law does not forbids monopoly, if a company is superior than other companies they should not be penalized for winning the race to the top and for being the best. Competition law prohibits the abuse of a dominant position[120]. Also, IP laws do not give market monopoly, they only give a temporary monopoly of a certain product in order to recoup investments made, if we think in the software industry, we can perceive that there is not a monopoly but instead hard competition[121].

3.1. Should competition law deal with interface openness?

As we saw, IP provides certainty in an ex-ante situation, giving the investors an opportunity to recoup the investments made, giving them security when investing. Competition law provides an ex-post analysis, it corrects market failures and abuses of law by

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[118] See, *supra note* 37; pp. 104-106.

[119] Piedrahita, Carlos Andrés Uribe and Fernando Carbajo Cascón. ""Regulacíon «Ex Ante» y Control «Ex Post»: La Dificil Relacion entre Propiedad Intelectual y Derecho de la Competencia." *Actas de derecho industrial y derecho de autor* n.d. pp. 308 and 309.

[120] Pranvera, Kellezi. *"Abuse below the Threshold of Dominance? Market Power, Market Dominance, and Abuse of Economic Dependence"*. University of Geneva, 2007, pp. 71-84. See also Korah, Valentine. *Intellectual Property Rights and the EC Competition Rules"*. Hart Publishing, 2006. pp. 133-136.

[121] Case T-69/89, Magill para. 46.

analyzing, in a case-by-case basis, the situations that lead to an abuse of a dominant position, and it corrects the imperfections of the market.

Competition law takes the certainty that IP gives, however, when analyzing the concrete situations, competition law does gives an approach to the problems with a higher certainty than the ex-ante legislation, it takes into account the details of the case, the economic and legislative problems and the solution is of higher reliability. When we involve the courts to solve the problems of market efficiency we can expect a reliable decision. In the process different specialists from several areas are always involved, from the area of competition law, of intellectual property, economy, programmers, technology experts, etc.

Another issue associated with an ex-ante protection is the lobby[122] that goes hand-to-hand with legislators. The pressure to take a path when legislating is immense and big companies do enter into this kind of pressure with legislators. Legislators most of the times do not have any kind of background in technology and when legislating they do not have into account the dynamic and ever changing market of technology.

Competition law interference does not have only good things; it has some negative aspects. When using an ex-post assessment we are interfering in the legal protection of IP, we are taking away part of the investors' confidence in the legal certainty, we are decreasing dynamic efficiency, we are interfering with a balance that was previously made, and we are decreasing dynamic efficiency to increase static efficiency. But the ultimate goal of both IP laws and competition laws is to increase innovation and consumer welfare. When decreasing innovation we are in a previous step, decreasing market efficiency and consequently, consumer welfare. The competition authorities must have limited influence when dealing with IP rights, and the intrusion must be minimum. On the other hand we also have inflexible IP laws that can decrease static efficiency, giving more weight to one of the balance plates, consequently creating instability on the thin balance between dynamic and static efficiency.

Furthermore, highly restrictive ex-post control will create barriers to investment and innovation; it could disrupt the market when creating distrust in the legal protection pre-conceived. We can perceive that there is a dichotomy when talking about the desirable level of protection given to IP through Competition law. There is not a clash on the objectives that

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[122] For further development see Coen, David. ""The European Business Lobby"." *Business Strategy Review* (1997).

both IP and Competition pursue but instead, a tension on the level of the protection that should be given.

We already saw that interfaces that provide interoperability are protected by copyright law, copyright law is indeed a IP right given in an ex-ante situation, however, we also saw that secondary markets and vertical competition can be closed by the dominant firms who own these rights, this can be perceived as an abuse of law. If a secondary market is closed by a right that was initially meant to prevent horizontal competition disruptions, we can comprehend that IP objectives are being disrespected. Innovation is being constricted by the same rights that aim on protecting innovation initiatives.

Faulty IP rights do exist given the complexity of the volatile technological market and in those cases there should exist a way to correct them, and here is where competition law should intervene[123]. [La posición doctrinal mayoritaria considera que la relación entre estructura de Mercado e innovación tiene una forma de "U invertida", significando que los dos extremos (competencia perfecta y monopolio) son los puntos donde se produce una menor innovación][124].

When there is an exclusion from third parties due to IP rights, it can eventually open a door to competition authorities' intervention. The historical perspective was that the IP rights were in higher ground of protection. In the past, when a tension existed between IP and competition, it was the IP rights that prevailed because of the recognition of a previous right that was given to the right-holder[125]. As can be seen, nowadays, things are not as conservative as they were, nowadays; an economic analysis is required, especially when there is a foreclosure of a downstream market[126].

An example that an ex-ante protection is important and should be (in the plausible limit) left alone or with little intervention, are the mergers and acquisitions that competition law deals with. When understanding if a merger is going to be detrimental or beneficial to competition, competition authorities are going to assess in a previous stage if the merger can

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[123] For further development see, *supra note* 113; pp. 315 to 318

[124] Ibid. p. 318.

[125] This recognition of primacy to IP law was highly defended in the US courts as can be seen in the cases, *E Bement & Sons v National Harrow Co.*, 186 US 70, 91 (1902) and *Richard S. Simpson, Petitioner, V. United Oil Company of California*, 377 U.S. 13. 310, (1964).

[126] Report by the EAGCP, "An economic Approach to article 82", July 2005, pp. 26, 27 and 28.

or cannot happen and if accepted, the merger cannot than be reversed. In order to get these decisions, competition authorities make an economic analysis on the case.

3.1.1. European Union Lobbying

Lobbying nowadays is a normal way of doing politics and sometimes also welcomed. In the European Union system it all began with the increasing legislative power transfer from the member countries to "Brussels". In a first instance, industries were lobbying through the industry Federations[127] but soon the companies realized that the process was doomed to be slow and lost its credibility. It was then that companies started to make direct lobbying and the Commission welcomed this increasingly movement of lobbying, the Commission was overwhelmed by the legislative functions that it possessed (between 1985 and 1993) and the companies provided the technical expertise from the different areas of interest.

As the legislative process started to decline and the legislative efforts were no longer overwhelming the Commission felt an overload of lobbyist and it was then that was created the industrial forums[128] where companies of a certain specific area gather and discuss the legislative process emitting opinions.

This gives us an understanding on how the ex-ante legislation on software was introduced, lobby is part of modern politics and it is many times influenced by the companies' experts that always go in accordance with the companies interests. We do not say that the legislative process is made by the companies only that it is sometimes influenced by the highly skilled experts on certain technical matters.

3.2. Essential facilities doctrine

Before moving on to the analysis of case law, there needs to be made a small study of the essential facilities doctrine and how it is used in the EU.

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[127] See, supra note 116; p. 18.

[128] Ibid. pp. 19-20.

The essential facilities doctrine is the main method to force a company to share its interface information[129]. In terms of competition law, there are two main actions that can be sanctioned, the first one is the formation of cartels or agreements between competitors that distort the competition process, and these agreements are foreseen in article 101 TFEU.

The second one is the exclusion of competitors through the abuse of dominance[130], dominance per se is not forbidden, and a company can become dominant through its better products or prices. This abuse of dominance[131] is foreseen in article 102 TFEU and is the most relevant for the analysis of the doctrine in question. Article 102 TFEU does provide a list of what is considered an abuse of dominance[132], however, the list is not extensive and it leaves the courts room for a wide interpretation. In the European Union, companies are allowed to choose with whom they do business and make contracts as well as the terms in which they contract, yet, there are exceptional circumstances that can be invoked to obligate a company to contract, for example: when a facility is essential to compete in a vertical market.

This doctrine was first applied and developed to physical and tangible infrastructures[133]. Due to the lack of rigidity in interpretation of article 102 TFEU the essential facilities doctrine was many times invoked in cases of horizontal competition, in IP matters and nowadays it is also presented as an argument in technological matters. The problem here would be the balance of the incentives to innovation and the competition effects.

The obligation to grant access to the facilities may well act as a disincentive formula as far as innovation concerns. Companies usually invest in development of their facilities in order to keep or gain competitive advantage. When a company is forced to give access to those facilities it loses the investment made as well as the competitive advantage.

Companies may be reluctant to innovate when observing the normal application of the essential facilities doctrine and the lack of certainty and predictability of this doctrine[134]. The essential facilities doctrine should be applied only in exceptional circumstances and

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[129] See, *supra note* 19; pp. 178. See also Microsoft v Commission case T-201/4.

[130] Korah, Valentine. *Intellectual Property Rights and the EC Competition Rules"*. Hart Publishing, 2006." pp. 133-136.

[131] Lipsky, Abbot B., Jr. and Sidak, J. Gregory, "Essential Facilities" pp. 1211-1212 at: http://ssrn.com/abstract=205668 last seen in 28-03-2016.

[132] Article 102 TFEU.

[133] See, *supra note* 125; pp. 1212-1214.

[134] See, *supra note* 125; pp. 1218-1220.

interpreted "*cum grano salis*", this means, that it should be applied with good sense taking into consideration the possibility of causing damages.

When talking specifically of the obligation to disclose the interface information, the subject is even more delicate because we are entering in the field of IP. IP is a protection given in an ex-ante stage and it protects the IP owners from a possible free-rider on their effort and investment at the same time granting predictability and security.

The indispensability threshold to provide access to IP rights must be higher than the threshold to grant access to physical facilities. The difference between these two situations is the one that in physical facilities, when granting access, the right to the facility and the economic investment is not lost, the right-holder is still the owner of the facility, and the facility is not lost to the competitor to whom the access was granted.

In the case of mandatory access granted in the field of IP everything changes, the very essence of IP rights is the fact that the right-holder can benefit from the temporary monopoly granted ex-ante to retrieve profits from the product[135]. When other competitor wants to use the IP right in its advantage, the monopoly is lost; the "facility" is now in the sphere of the right-holder and its competitors.

The application of article 102 TFEU to these situations seems to be a patch used to correct ineffective ex-ante rights. Article 102 TFEU is used in situations of abuse of a dominant position; however, what the dominant companies are in fact doing is nothing more than the application of rights given by governments in matters of IP. An illustrative case to understand these situations is the Volvo case.

The Volvo case was about the delimitation of spare parts design and subsequently impossibility of other companies producing spare parts for Volvo cars, what happened after the Volvo judgement was the reformulation of ineffective ex-ante rights[136]. This situation provides us information's on how to solve problems of interface information's and what access should be granted to competitors. The reformulation of IP rights that protect interface information by using this method rather than the application of article 102 TFEU, would secure the predictability, competition efficiency and innovation

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[135] Ibid. pp. 1218-1220.

[136] For further development see Volvo/Veng case 238/87.

Another matter that can raise some issues of unpredictability is the Regulation 1/2003 and the power given to the Commission to apply fines and remedies.

Recital 12 states: "This Regulation should make explicit provision for the Commission's power to impose any remedy, whether behavioural or structural, which is necessary to bring the infringement effectively to an end, having regard to the principle of proportionality. Structural remedies should only be imposed either where there is no equally effective behavioural remedy or where any equally effective behavioural remedy would be more burdensome for the undertaking concerned than the structural remedy. Changes to the structure of an undertaking as it existed before the infringement was committed would only be proportionate where there is a substantial risk of a lasting or repeated infringement that derives from the very structure of the undertaking."[137]

The problem of giving this power to the Commission is that there is no prior experience in these subjects. The Commission has to determine the amount of information that should be disclosed, the value of the fines that have to be paid (by the abusive company) and this brings great uncertainty to right-holders. It seems that the easiest way to prevent this situation is through private agreements, negotiations or reformulating ex-ante regulations.

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[137] Regulation 1/2003.

Chapter III

Case Law Analysis

1. Case Law approach

It should be noted that the cases presented were chosen because of its great relevance and importance on the EU jurisprudence.

To understand the line of thought that is taken within the European Union and what happens in real life, there needs to be made an analysis of case law and how decisions were made as well as the criteria used to reach those decisions.

Competition intervention as already seen needs to work as a safety net, to correct some imperfections that rise with faulty IP laws. An IPR alone does not confer monopoly or market power. An economic analysis of the static and dynamic efficiency needs to be made in order to perceive what the economic consequences are when messing up with ex-ante rights.

Article 102 TFEU does not prevent market power; it only prohibits abuses of dominant positions. What is considered an abuse was left to the competent authorities to decide. Since 1974 with the *Commercial Solvents* case this subject has been scrutinized.

In the technological field interoperability is a main characteristic needed to compete viably in the market. Non-interoperable programs could be excluded from the market, and to achieve interoperability there has to be access to interface specifications.

Usually for a firm to compete viably in the market there is not any obligation for competitors to provide access to their interfaces, as it was explained in *Bronner*[138] case. *Bronner* wanted access to *Mediaprint`s* distribution system of newspapers, and the decision was not favourable to *Bronner*, forcing the company to create distribution facilities of their own, this because there was no real impediment to the creation of such facilities nor it was economically unreasonable[139].

In the technological area the situation differs, because it is a market of high network effects, this means that if the market tips in favour of a company's product, it will be very difficult to access downstream markets without interoperability information.

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[138] Case C-7/97.

[139] See, *supra note* 29; pp. 49-50.

Dominant companies to prevent disclosing interoperability information claim that when there are more components interoperating with the software the more vulnerable it stays to virus and cyber-attacks, it is a security hazard.

1.1. *Volvo/Veng* Case

The first case that dealt with "refusal to supply" topic was the *Volvo/Veng* case. In this case, the proprietor of a registered design (*Volvo*) refused to grant a license to *Veng* for the import and sale of body panels of Volvo vehicles, and *Veng* perceived this as an abuse of dominant position. *Veng* imported car parts to be used as substitutes in *Volvos* vehicles, those being manufactured without permission of *Volvo*[140].

Accordingly to paragraph 9:

"It must however be noted that the exercise of an exclusive right by the proprietor of a registered design in respect of car body panels <u>may be prohibited</u> by Article 86 if it involves, on the part of an undertaking holding a dominant position, <u>certain abusive conduct</u> such as the <u>arbitrary refusal to supply spare parts to independent repairers, the fixing of prices for spare parts at an unfair level or a decision no longer to produce spare parts for a particular model even though many cars of that model are still in circulation</u>, provided that such conduct is liable to affect trade between Member States"[141].

From this excerpt we can perceive that a refusal to license[142] may be prohibited by article 86 (now article 102 TFEU), if particular factors are present in the equation. The company that retains the IP right does have the power to prohibit reproductions and to not give licenses to other companies to sell the item; however, the monopoly does not extend to the secondary markets. When dealing with obligations to grant access to ex-ante rights of IP we need to think that we are depriving the right-holder from the exclusivity of his rights, the exclusivity of making money from the product developed by him[143].

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[140] See, *supra note* 1; pp. 76-77.

[141] Case 238/87 para. 9.

[142] See, *supra note* 8; pp. 93-95.

[143] Anderman, Steven and Ariel Ezrachi. *"Intellectual Property and Competition Law"*. Oxford University Press, 2011." pp. 143.

These decisions on when is it or is it not mandatory to grant access to IP facilities is a controversy subject and very unclear to right-holders that did not have any kind of guidance in this matters, it was because of that, that the European Commission emitted the Guidance paper on the enforcement of article 82 (now article 102 TFEU) to abusive exclusionary behaviours[144], however, the guidelines did not brought any advances on the understanding of the exclusionary conducts, in fact, they only brought even more confusion.

1.2. *Magill* Case

Some years later the courts were faced with another case of compulsory licensing, the *Magill* Case[145], this case took action in the Republic of Ireland, where there were three weekly TV guides in circulation, those TV guides were all related to the different channels.

There were three TV channels with three different TV guides, and all of the TV channels did provide the daily programming to the different newspapers for free, but the weekly programming was left exclusive for each TV guides. TV enthusiasts had to buy three guides to program their favourite shows. *Magill* had the idea to compile the three different TV guides into one TV guide. As to be expected, TV broadcasters in joint litigation took to Irish courts a complaint on the disrespect of copyrights[146].

Magill, presented a complaint in the Commission, claiming that the attitude of the TV broadcasters was violating article 86 of the EEC treaty. The commission did consider the *Magill* pretensions correct and decided in its favour, considering that the TV broadcasters were abusing their dominant position in a secondary market[147], the Commission obliged the TV broadcasters to license (in return of a royalty) the programs guides. The Court of First Instance (now General Court) decided in favour of the Commission:

Paragraph 73 states: "Conduct of that type-characterized by preventing the production and marketing of a new product, for which there is potential consumer demand, on the

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[144] DG Competition, Communication from the Commission, Guidance on the Commission´s Enforcement Priorities in Applying Article 82 EC Treaty to Abusive Exclusionary Conduct by Dominant Undertakings, 2009, OJ C45/7.

[145] Case T-69/89, Magill.

[146] See, *supra note* 29; pp. 46-48.

[147] See, *supra note* 137; pp. 96-99.

ancillary market of television magazines and thereby excluding all competition from that market solely in order to secure the applicants monopoly – <u>clearly goes beyond what is necessary</u> <u>to fulfil the essential function</u> of the copyright as permitted in Community law. The applicants refusal to authorize third parties to publish its weekly listings was, in this case, arbitrary in so far as it was not justified either by the specific needs of the broadcasting sector, with which the present case is not concerned, or by those peculiar to the activity of publishing television magazines. It was thus possible for the applicant to adapt to the conditions of a television magazine market which was open to competition in order to ensure the commercial viability of its weekly publication, the RTE Guide. The applicants conduct cannot, therefore, be covered in Community law by the protection conferred by its copyright in the programme listings[148]".

It is good to observe the essential facilities function and its application on subjects not related to the technological market. The essential facility doctrine was developed in cases where there was a refusal to deal. It has its origins in the United States judicial system, but it was adopted by many countries around the world (in Europe, Australia, South Africa). Basically, this doctrine deals with situations in which a monopolist company that owns an indispensable facility for other competitors refuses to grant access or to deal with those other companies in need.

In the United States legal claiming there needs to be made proof of certain aspects: control of the essential facility by the monopolist; the competitor's inability to reproduce the facility; that the monopolist company has denied use of the facility to the competitor and that providing the facility to competitors is feasible.

It is very hard for a company to prove that it is completely indispensable to use a certain facility to enter into the desired market, besides that, it has to prove that it would be impossible or nearly impossible to reasonably reproduce the facility, also, it has to prove that the use of the facility will not affect the capability of the right-holder to continue its business and serve its customers[149].

This could better be illustrated through an example: in the railroad business, if someone owns the infrastructure of the railroad (the rails), and a company that produces coal

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[148] Case T-69/89, Magill, para 73.

[149] For further developments see, *supra note* 125.

wants to use the rails, to transport it, it would be disproportional to construct the entire network of rails, it would be necessary to invest millions to construct a new railroad[150].

The question here is if the essential facilities criteria, normally used with questions of physical infrastructures could be employed in matters of IP, of non-physical infrastructures. The Court of Justice in the *Magill* case gave an answer and created certain criteria's to ascertain whether or not there are exceptional circumstances and consequently obligation to provide access. The conditions are:

1) the refusal to license must concern a product or service that is indispensable for carrying on a business[151];

2) the refusal prevented the appearance of a new product, a comprehensive weekly guide to television programs, which the television companies in question did not offer and for which there was a potential consumer demand. (Such refusal constitutes an abuse under article 86 of the Treaty)[152];

3) there must exist a justification for the refusal[153];

4) the refusal reserved a secondary market, by excluding all competition on that market[154].

There is no proof that the essential facilities doctrine was used in the *Magill* case, however, we can ascertain that there are some similarities with the same. The difference of applying the essential facilities doctrine to non-physical assets is: when obliging a right-holder for example of a rail road to grant access, the right-holder will continue to own the rails and in the IP case the same doesn't happen, when access is granted to the IP right, the IP right-holder will not have the same ability to make profits from it. In this case, through the compulsory licence competition and innovation were enhanced.

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[150] See, *supra note* 125; p. 1212.

[151] Appeal Case before the General Court T-69/89 para. 53.

[152] Ibid para. 54.

[153] Ibid. para. 55.

[154] Ibid. para. 56.

1.3. *IMS* Case

Another relevant case is the *IMS*[155] case. *IMS* was the leading company on gathering and supplying data on deliveries to pharmacies by wholesalers of pharmaceuticals. The effectiveness of pharmaceutical companies in its promotional affairs was measured by this data. *IMS* divided the German market into one thousand eight hundred and sixty geographic zones that were based in the postal codes.

This format developed by *IMS* in association with its customers had become the *de facto* format, and this format took into account deliveries, prices, volumes, location of bridges, hospitals, pharmacies and doctors clinics. *NDC* a direct competitor of *IMS* appeared in the market and wanted to provide sales data (independently obtained) in the same format as *IMS* (using the same geographic divisions). *IMS* relied on copyright to prevent *NDC* from using the same geographic format. It is also of importance to state that all costumers discarded the use of other geographic division.

NDC challenged the *IMS* copyrights stating that it would be impossible to enter in this market without using the *IMS* geographic divisions of Germany, although *NDC* did not brought any new product; they stated that the delivery method and how it would obtain the market information was innovative and technologically different[156]. Unlike the *Magill* case, there is no new product and no foreclosure of a secondary market.

According to a request of a German court (where the case was pending) the Court of Justice gave a preliminary ruling. The court, making a reference to the *Magill* and *Bronner* cases decided and considered that a refusal to license could be considered to be abusive if four conditions are met[157]:

1) the protected product is indispensable for carrying on a business;

2) the refusal is such as to exclude any competition on the secondary market;

3) the refusal prevents the emergence of a new product for which there is a potential consumer demand;

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[155] Case C-418/01.

[156] For further development see, *supra note* 29; pp. 49-52.

[157] See, *supra note* 137; pp.148-150.

4) the refusal is not justified by any "*objective considerations*"[158].

An important consideration to the analysis of these criteria is that, according to the Advocate General (Poiares Maduro) these conditions are cumulative[159]. Now we could ask what is considered indispensable for carrying a business. We need to perceive that a product can be helpful in starting a business and entering into a market but without necessarily being indispensable. Fortunately some considerations have been given in this regard.

Paragraph 28 states: "It is clear from paragraphs 43 and 44 of *Bronner* that, in order to determine whether a product or service is indispensable for enabling an undertaking to carry on business in a particular market, <u>it must be determined whether there are products or services which constitute alternative solutions</u>, even if they are less advantageous, and whether there are technical, legal or economic obstacles capable of <u>making it impossible or at least unreasonably difficult for any undertaking seeking to operate in the market to create</u>, possibly in cooperation with other operators, the <u>alternative products or services</u>. According to paragraph 46 of *Bronner*, in order to accept the existence of economic obstacles, it must be established, at the very least, that the <u>creation of those products or services is not economically viable</u> for production on a scale comparable to that of the undertaking which controls the existing product or service."[160]

So, the criterion of indispensability is not applied if there are viable solutions. In this case, the national courts were left to decide whether the conditions were applicable to the situation and to the facts.

Paragraph 49 states: " Therefore, the refusal by an undertaking in a dominant position to allow access to a product protected by an intellectual property right, where that product is indispensable for operating on a secondary market, may be regarded as abusive only where the undertaking which requested the licence does not intend to limit itself essentially to duplicating the goods or services already offered on the secondary market by the owner of the

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[158] Case C-418/01 para. 37-38.

[159] Advocate General Poiares Maduro Opinion in case C-109/03 KPN Telecom BV v. Onafhankelijke Poste n Telecommunicatie Autoriteit, 2004, para. 35.

[160] Case C-418/01 para. 28.

intellectual property right, but intends to produce new goods or services not offered by the owner of the right and for which there is a potential consumer demand[161]"

 Paragraph 50 states: "It is for the national court to determine whether such is the case in the dispute in the main proceedings.[162]"

Now, one may argue that the refusal to use only the structure of the geographical division owned by *IMS* is an abusive behaviour, and once again, the Court of Justice only made an analysis to the abstract principles and not to the facts (that were left to the national court).

Paragraph 52 states: "(...)that the refusal by an undertaking which holds a dominant position and owns an intellectual property right in a brick structure indispensable to the presentation of regional sales data on pharmaceutical products in a Member State to grant a licence to use that structure to another undertaking which also wishes to provide such data in the same Member State, constitutes an abuse of a dominant position within the meaning of Article 82 EC where the following conditions are fulfilled:

— the undertaking which requested the licence intends to offer, on the market for the supply of the data in question, new products or services not offered by the owner of the intellectual property right and for which there is a potential

— the refusal is not justified by objective considerations;

— the refusal is such as to reserve to the owner of the intellectual property right the market for the supply of data on sales of pharmaceutical products in the Member State concerned by eliminating all competition on that market.[163]"

We can perceive that the legal foundation for the refusal to supply was restrained, the criteria that was used in the *IMS* case is more restrictive than that used in the *Magill* case. This case is of great relevance because only some weeks before *IMS* judgement, a decision was taken in the *Microsoft*[164] case by the Commission.

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[161] Ibid. para. 49

[162] Case C-418/01 para. 50

[163] Ibid. para. 52

[164] Case Comp/C-3/37.792, EC Commission v. Microsoft.

1.4. *Microsoft* **Case**

In 1998 *Sun Microsystems* (a provider of server hardware and software) requested *Microsoft* to provide the interoperability information necessary to develop their own technology that was intended to perform the work-group functions, this is, to link a family of computers, for example in a company. This operating system intended to facilitate the use of printers or authentication of users. In second place, *Microsoft* was accused of integrating the windows media player when selling the Windows PC operating system, it was an automatic purchase, and there was no form of rejecting or opting not to acquire the windows media player.

We need to have into account that the media player market is a different market from the operating system one. *Microsoft* being the market leader in what concerns operating systems took advantage of that to provide a different product (a media player).

Microsoft was at the time developing a new function of its operating systems, the technology that was being developed was called Active Directory, this technology was revolutionary at the time, it provided Windows users the ability to have the same user experience in any computer around the world, access confidential documents and other services. It provided the company administrators the ability to provide to all company computers general policies; to install programs in all the computers and apply updates.

Sun Microsystems requested the interoperability information so that its work group server could access this new technology, without this access it was very likely that they would lose many clients[165].

The commission found that *Microsoft* by refusing to provide the requested information was in fact abusing its dominant position. It was taking its advantage in the PC operating system as leverage in another market. Microsoft owned a program for work-group functions and the interoperability information necessary to access the Active Directory function.

Microsoft argued that *Sun* had the access to interoperability information and how to achieve it. It was all explained in *Microsoft`s* website. It was said that many server operating systems did in fact interoperate with *Windows* operating system; furthermore, the problems

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[165] See, *supra note* 29; pp. 53-62.

with interoperability could be fixed by using add-ons, reverse engineering or decompilation[166].

Sun did in fact have access to that basic interoperability information. However, what was intended was not a basic interoperability access but instead a native level of interoperability. The Commission perceived that interoperability was a question of degree[167], what *Microsoft* provided was basic information to interoperate, something that was not enough to the case in appreciation.

Paragraph 139 states: "The Commission also recognises that there is a whole range of possible degrees of interoperability between PCs running *Windows* and work group server operating systems and that some interoperability' with the *Windows* domain architecture is already possible. It did not fix a priori a given level of interoperability which is indispensable to the maintenance of effective competition on the market but, following its investigation, it established that the degree of interoperability that competitors could achieve using the available methods was too low to enable them to remain viably on the market."[168]

The Commission emitted the rulings only weeks after the Court of Justice rulings on the *IMS* case and the approach taken in each case was substantially different. The refusal to supply was the main point in discussion in both cases but the methods to perceive if there is an infringement in a refusal to supply were disparate.

The Commission argued that the *IMS* criteria should not be applicable in this case due to fundamental differences of the cases and different assessment under article 102 TFEU.

Paragraph 168 writes: "The Commission, on the other hand, contends that an automatic' application of the criteria laid down in IMS Health, cited in paragraph 107 above, would be 'problematic' in this case. It maintains that, in order to determine whether such a refusal is abusive, it must take into consideration all the particular circumstances surrounding that refusal, which need not necessarily be the same as those identified in Magill and IMS Health, cited in paragraph 107 above. Thus it explains at recital 558 to the contested decision, that '[t]he case-law of the European Courts ... suggests that the Commission must analyse the

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[166] See, *supra note* 137; pp.151-154

[167] Case T-201/4, Microsoft v Commission para. 139

[168] Ibid. para. 139

entirety of the circumstances surrounding a specific instance of a refusal to supply and must take its decision [on the basis of] the results of such a comprehensive examination." [169]

In the Commission decision it was stated that a compulsory license should only be granted in exceptional circumstances[170]. In the *IMS* case three cumulative conditions had to be met in order to be granted a compulsory licence, and the Commission applied those conditions to the *Microsoft* case: 1) the refusal relates to a product that is indispensable to the exercise of a particular activity in a neighbouring market; 2) the refusal is of such kind that as to exclude any effective competition on that neighbouring market; 3) the refusal prevents the appearance of a new product for which there is potential consumer demand[171].

A refusal to license may be abusive and considered to violate article 102 TFEU unless the dominant company proves that the refusal has been objectively justified[172].

In the *Microsoft* case the *IMS* criteria was applied but the interpretation made was innovative, the expression "indispensability" gained a new meaning from the previous cases, the indispensability criteria is fulfilled if the IP in question is indispensable to compete viably[173].

Paragraph 390 states: "More specifically, the Commission considers that, <u>in order to be able to be viably marketed</u>, non-Windows work group server operating systems must be capable of participating in the Windows domain architecture…"[174]

It was also found that the condition of eliminating competition was also fulfilled. The refusal created a risk of eliminating all effective competition:

Paragraph 563 states: "What matters, for the purpose of establishing an infringement of Article 82 EC, is that the refusal at issue is liable to, or is likely to, eliminate all effective competition on the market…"[175]

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[169] Ibid., para. 316.

[170] Ibid. para. 331.

[171] Case T-201/4, para. 332.

[172] Ibid. para. 334.

[173] Ibid. para. 230; 258-250 and 369-422.

[174] Ibid. para. 390.

[175] Ibid. para. 563.

In matters of IP rights and compulsory license seems that the essential facilities doctrine is not enough. It is a lot easier to perceive the indispensability of a physical facility. The focus in this IP cases seems to be if it is possible to do or to open a business without that license.

Applying the essential facilities doctrine to the technological area may not be the best solution. Companies can start decreasing their investment in innovation and it disregards competition for the market, the essential facilities doctrine is more focused in safeguarding competition in the market. We also have the disincentive of investment made in innovation, by forcing a competitor to share their secrets and technology.

The new product test appears as giving a higher threshold of protection but the reality is that even when the new product test is fulfilled, the right-holder when disclosing interface information's is losing its proprietary work and the access control to its software.

2. Striking the balance of competition for/in the market

In the software market, when talking of a situation where there is competition using closed interfaces, consumer demand for network effects usually dictates to which firm the market will tip. This means that if we have two companies: company A and company B and both provide a software product, but company A has 10 000 users and company B has 1000 the probability is that the market share will tip in favour of company A due to the higher networking effects that consumers are looking for. Because company A is already settled in the market with a strong network position, companies in this situation compete for the entire market share, for a monopoly position instead of competing in the market[176].

In the situation of open interfaces, companies do not compete for the network share because the interoperability between the different software's is equal and users from company A and company B can communicate and access freely between them, this situation can indeed improve innovation[177].

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[176] Geroski, P.A.; 2003, Journal of Industry, Competition and Trade; "Competition in Markets and Competition for Markets" pp. 152- 154.

[177] See, *Directive 2009/24/EC9*; pp. 163-165.

When companies are competing for network share they will tend to improve and create their auxiliary components, creating a wide variety of interoperable products and even decrease their price, however, innovation in the software *per se* will not be developed, leaving aside technological advances in this field[178].

Interface openness can eventually incentivize independents to create a huge number of components and programs that can increase consumer welfare and network effects. The downside is the potential loss of profits in the downstream market and because the accessibility to the interconnection with the software is so easy to everyone, security issues can become a threat. The Internet is a perfect example of interoperability openness that lead to a widespread popularity and content sharing, becoming what we know today.

Because competitors know that in the software market, tipping, is very likely to happen, the competition will be for the market and not in the market. In the competition among vertical products, tipping is less relevant and the competition is made in the market. Market shares are more relevant in the first situation.

Striking a balance between the both forms of competition could be a good way of enhancing competition. In a first assessment, having many competitors in the market is more competition friendly than just having one market actor, and sharing among competitors seems to lead to less innovation. Interface control is an inherent right given to companies, but at the same time, this control leads to competition for the market and restricts interoperability.

The essential facilities doctrine is the exception to the rule, sharing as a mandatory obligation; it appears to give a confusing balance between competition for/in the market. It is confusing because it seems to be a temporary patch to solve a permanent problem, through an ex-post approach. It is required a more permanent solution and legislation on this matter, an ex-ante approach.

2.1. Schumpeter`s analysis and critic

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[178] Ibid. pp. 162-165.

In Schumpeter's opinion, competitors are interested in gaining the entire market share and not only part of it, not percentages but the totality, and that is a good mechanism for enhancing innovation[179]. Gaining monopoly power isn't harmful, instead, it gives the monopolistic company a better position to invest more in R&D because it has more economic power and it is in a better position to do so. The simple idea of losing the monopoly power should be enough concern for the dominant company to always invest in innovation.

For companies to become dominant or to depose a dominant one they need to be more innovative, they need to bring to the market a product that consumers will prefer rather than one that has the higher networking. Effects of competition for the market are not only concerned with innovation, companies will also compete in prices; giving lower prices will also play a role in tipping. Windows and Apple are competing companies of software. The market in this case tipped to Windows where it takes advantage of more than fifty percent of market share[180]; however, it did not stop the innovation efforts due to the constant developments in innovation of Apple.

The Schumpeterian position of incentives for innovation is controversial and lacks of empirical proofs. High barriers of market entrance can be dissuasive for competitors to enter in the market and lower barriers can stimulate innovation among the competitors and the dominant firm. The competitors because they want to increase market share and the dominant company because it does not want to lose market share.

In terms of software this translates into openness or control of interfaces. Openness is considered a low entry barrier because competitors do not have to persuade consumers to change their network due to the possibility of interoperating with the previous network to which they belong. On the other hand control over interfaces can constitute an entry barrier for the opposite reasons; consumers will be reluctant to change due to the low network effects of the non-dominant companies.

We can make some conclusions; competition in the market is related to openness of interfaces and interoperability easiness. Control of interfaces is exactly the opposite and is connected with competition for the market, competition to gain the entire market share.

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[179] For further development see, *supra note* 30.

[180] http://gs.statcounter.com/#desktop-os-ww-monthly-201511-201511-bar Last seen in 07-01-2016.

What is more likely to be pro-competitive? The general acceptance is that having multiple competitors competing in the market will be more beneficial due to the high pressure from the different market actors.

2.2. Vertical competition

It is easy to perceive that interface control could be a way to gain access in secondary and vertical markets. If interface specifications were completely closed, secondary markets would eventually be controlled by the main software owners, leveraging their power from one market to another.

In the vertical market we should bear in mind that interoperability is everything. Let's take the media player example: a creator of a media player needs to interoperate with the software where the program is going to run. It needs accessibility to the disk, the ram, the display, etc. If such interoperability is not provided the only media player running on Windows software would be the Windows Media Player and the only media player running in Mac OS would be QuickTime.

The media player market would be completely closed; there would be no competition, not even between the Windows and Mac media players because they would only run in the respective software's.

In vertical competition, interoperability easiness would incentive innovation. Inventors will more promptly invent a secondary component to interact with the software instead of inventing completely new software's (something of higher difficulty and more market entrance barriers). Because it is relatively easier to compete in the downstream markets, inventors will be more predisposed to enter into those markets and subsequently increase competition and innovation.

Because buyers buy those products at different stages the effects of control over interfaces are discussed mainly by the Chicago, post-Chicago and Harvard schools. The studies of these prior schools are important to understand the contemporary problems. As

Ludwig Von Mises said, "If we wish to understand the contemporary events we would do well to read the books written 20 or 30 years ago"[181].

2.3. Schools of Thought

2.3.1. Harvard School

According to this school the high concentration of market power by one company is harmful for country`s economy and politics. The S-C-P paradigm is developed by this school; it measures the harm to competition using different guides.

The paradigm uses the relationship between structure, conduct and performance, this means that the market structure influences the conduct of a given company and in turn influences its performance[182].

One of the major concerns of the proponents of this theory was to restrict market power. For them it was important to achieve multiple objectives such as stability of the economy, distribution of equity and decentralization. They believe that markets are unstable and prone to failure. In their opinion large companies are prone to earn profits not by better efficiency but instead by market power, something that could be harmful to consumer welfare.

High market power and high entrance barriers would eventually lead to price increase and collusion between companies, eventually leading to less consumer welfare. This school backed up their arguments in data from companies and case studies[183]. During the peak of Harvard school high interventionist powers were provided to the competition authorities and victims of the dominant enterprises were given more power and ways to protect their rights. One other point that was on the agenda, were the vertical restraints that they considered illegal and senseless.

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[181] F. Bohm, "Democracy and Economic Power" in Cartel and Monopoly in Modern Law (Karlsruche: C.F. Muller, 1961) p. 36.

[182] Gormsen and Liza Lodvdahl. *"A Principled Approach to Abuse of Dominance in European Competition Law"*. Cambridge University Press, 2010. p. 30.

[183] See, *supra note* 175; p. 31.

2.3.2. Chicago School

The Chicago school unlike the Harvard school disregarded multiple goals, focusing in one main aspect, the economic efficiency. They were skeptical of the S-C-P paradigm and advocated for vertical restraints.

Bork, one of its main enthusiasts, alleged that the most important result should be enhancing the total welfare based on productive efficiency and surplus. He argued that allocative efficiency should be increased but without harming productive efficiency. This tells us that his main concern was consumer surplus. Consumer surplus models are not interested in wealth distribution they do not care about the identity of the market actors, what is important is the total welfare[184].

According to this school pursuing total welfare would be the best option for competition authorities due to the better consumer interest's protection. This model is not devoid of sense; it would indeed make sense in a market where monopolies were unstable and easily broken up, something that could only be regarded as utopic.

Bork stated that markets should only be seen for their economic efficiency and should disregard the link to the political system due to its ever changing characteristics[185]. He defends the maximization of profits as doctrine. Competition law should only intervene in very exceptional circumstances since the market would be self-sufficient and auto-corrective.

The Single Monopoly Theorem[186] is many times associated with the Chicago School. It argues that there is no interest in a monopolistic company to raise prices in an adjacent market, because consumers will only be willing to pay a monopolistic price once for the combined products. This means that if a company sells computers and keypads and keypads can be bought in another (competitive) market, the computer company to increase prices in the keypads will decrease the prices of computers. This leaves no incentive for monopolistic companies to increase prices of downstream products.

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[184] See, *supra note* 175; p.34.

[185] Bork, H. ""The Role of the Courts in Applying Economics"." *Antitrust Law Journal* (1985), p. 21- 24.

[186] For further development see Elhauge, Einer. ""The Failed Ressurrection of the Single Monopoly Theory"." *Competition Policy International* (n.d.).

2.3.3. Post Chicago School

Economists moved from the Chicago School to the Post-Chicago School due to the realization of the ever-changing costs, information and also the volatile behaviour of consumers.

Both schools, the Chicago and Post Chicago School agreed that the main concern for the anti-trust authorities should be one of economy. In what they do not agree is the market failure. In one side, we have the Chicago School who believes that markets tend to correct themselves and that imperfections are only temporary. In the other side, the Post-Chicago School tends to think that market failures are not self-correcting[187] and that market actors will use those failures in their favour.

Earlier it was mentioned that the Chicago School believed that monopolistic prices would only tend to be used in one product and only be accepted once by consumers. Those monopolistic companies could only enjoy monopolistic prices once and couldn't leverage the power to other products. However, accordingly to the Post Chicago School, things are not as linear as above said, monopolistic companies can raise prices of products in a downstream market by foreclosure or tying[188].

The Single Monopoly Theorem also relies on companies that have an unchallenged position in the market, with no real threats to their power. However, in the fast-changing technological market, threats to monopolistic companies are very likely to happen and when that happens companies will leverage their power to other vertical markets, doing so, can be very profitable.

The Single Monopoly Theory presumes that consumers are able to calculate the costs of both primary and secondary market products, treating both markets separately, however, consumers aren't able to do so, they do not calculate and analyse the markets separately[189].

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[187] See, *supra note* 175; p.38.

[188] Ibid. p.38.

[189] For further development see, *supra note* 179.

Monopolistic influence in controlling secondary markets can decrease innovation. Control over interface information's to leverage power into vertical markets can foreclose those secondary markets for complementary products. Openness could have the opposite effect, and it could lead to more innovation and more competition.

Chapter IV

Recommendations and Conclusions

1. Comparison to the Telecommunications Law

Taking the telecommunications law as an example, we can take some ideas in what regards the path to be followed in the field of software interoperability and interface openness.

Telecommunications law incentivizes investment in infrastructures keeping at the same time a high level of interconnection between the different market operators, this happens with extensive ex-ante regulation.

Interconnection and interoperability are two forms of gaining and enhancing network effects: interconnection is a simpler way of connection, it is made in an horizontal market, in the other hand, interoperability is more complex, it is made mainly in the vertical market and occurs at a more logical level and it implies more risks such as breaches in security (proliferation of virus due to the high number of network effects).

Interconnection does not deal with IP issues and the problems are more related with infrastructures and prices as in the other side, interoperability has more legal issues that need to be overcome, but the analysis of the telecommunications law[190] is a good starting point to overcome the lack of ex-ante regulation and the subsequent decrease of intervention by the competition authorities.

When copyright law was created the major concern was to incentivize innovation and high thresholds were inputted by the legislators, interoperability issues were not taken into account at the time, copyright laws cannot keep up with the intense evolution of technology.

The benefits of network effects were not taken into account and copyright law gives high thresholds of protection to software and to its interface, creating a big barrier to interoperability. In the telecommunications industry, telephones wouldn't be of much use if they couldn't connect with each other. They are considered a network product as in the software industry, the products do not have at the time that kind of mentality and they are considered individual products.

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[190] Directive 2002/22/EC of the European Parliament and of the Council on universal service and users rights to electronic communications networks and services; 2002.

In this paper we do not predict what the future will bring, but it seems likely that technological products and its connections become more and more part of our daily life and that interoperability is increasingly essential. Maybe in the future it could evolve from the characterization of individual products to network products that have little use by themselves.

The internet of things is a good example, where glasses, watches, telephones, computers, TVs, surveillance cameras, freezers, cars, furniture, etc, are all connected and interoperable among them. An interactive piece of furniture by itself with no connection to other products such as our computer or telephone has little use and applicability, but when doing that interoperability, things evolve and change, it could be now regarded as a network product with an add value because of its interoperability.

The problem with this comparison is that the products that could be interoperable, do present some other functions by themselves as in the interconnection of telephones that doesn't happens. A telephone by itself is of no use (when talking about phones and not smart phones), whom are we going to call? Ourselves? It seems illogical.

For those reasons, telecommunications law was focused since the beginning on maximizing network effects and in the computer programs that focus was left aside as a secondary objective.

1.1. Early Regulation

In the early days of telecommunications, the costs of implementing and building infrastructures were very prohibitive, giving rise to the idea that monopoly would be the only viable solution.

To face the high costs of the infrastructures, there would need to exist a high number of subscribers, all contributing to the same purpose, the spread of telecommunications industries. The problem with the monopoly solution was the same as with all monopolies, it would give rise to high prices and the unfair maximization of profits due to the lack of competitors. The competent authorities were called to intervene and to control prices.

Due to the technological improvements, the costs of the infrastructures were reduced and the monopoly solution was considered obsolete. In the 80`s with the "Green Paper"[191] the market was liberalized leaving aside the monopoly regulations.

When removing the monopoly situation from the market, some points gained relevance, such as the interconnection between the different suppliers of telecommunications, and the removal of market barriers. Because now, there are different market actors supplying telecommunications services they could be prompted to impose barriers on connectivity with other market players and only provide connectivity between their respective costumers.

The solution passes through the mandatory interconnection between the market players. Telecommunications law relies on standardization *de facto* and *de jure*[192]. In this situation we have clearly competition in the market and not for the market; it is more unlikely that the market will tip in favour of a single company. If interconnection was not mandatory, market barriers to new players would be too costly and impracticable. The users of a telecommunications services would be very reluctant to change due to the already high network effects. This is something that happens in the software market.

1.2. Ex-ante over Ex-post protection

The analysis of the telecommunications law can give us some light on what type of protection we should prefer when dealing with interoperability issues. The problem of using copyright to protect interface specifications is the broadness of protection given and the apparent lack of suitability[193]. As already mentioned, similar protection is given to interface information's and to the software itself, it seems rather unfair that the software itself has a similar protection as the interface that the only job is to provide interoperability.

When giving the copyright protection, it is given to market player's, indiscriminate market power that in the future has to be corrected by the competition authorities. This problem could be corrected in an ex-ante situation as in the telecommunications law, more

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[191] Commission of the European Communities; "Green Paper on the development of the Common Market for Telecommunications Services and Equipment"; 1987.

[192] Directive 2002/22/EC.

[193] See, *supra note* 8; pp.79, 80.

specifically in articles 14 to 17 of Directive 2002/22/EC[194]. In a first place it is given a general definition of what is considered market power.

Article 14/2 states: "An undertaking shall be deemed to have significant market power if, either individually or jointly with others, it enjoys a position equivalent to dominance, that is to say a position of economic strength affording it the power to behave to an appreciable extent independently of competitors, customers and ultimately consumers[195]."

Article 15 lists the procedure for the identification and definition of the markets. Article 16 presents the market analysis procedure.

Article 16/4 states: "Where a national regulatory authority determines that a relevant market is not effectively competitive, it shall identify undertakings which individually or jointly have a significant market power on that market in accordance with Article 14 and the national regulatory authority shall on such undertakings impose appropriate specific regulatory obligations referred to in paragraph 2 of this Article or maintain or amend such obligations where they already exist.[196]"

Article 17 has an interesting text about interoperability and it deals with many questions about the standardization of interfaces.

Article 17/2 reads: "Member States shall encourage the use of the standards and/or specifications referred to in paragraph 1, for the provision of services, technical interfaces and/or network functions, to the extent strictly necessary to ensure interoperability of services and to improve freedom of choice for users[197]."

Article 17/4 states: "The Commission shall take appropriate implementing measures and make implementation of the relevant standards compulsory by making reference to them as compulsory standards in the list of standards (...)[198]"

We can perceive that the implementation of standards is encouraged in a first stage but the Commission reserves the ability to promote mandatory and compulsory standards.

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[194] Directive 2002/22/EC.

[195] Ibid; article 14/2.

[196] Ibid; article 16/4.

[197] Ibid; article 17/2.

[198] Ibid; article 17/4.

The copyright protection can be considered an impediment to interoperability since it promotes closing the interoperability information and leaves the ex-post regulation, case by case, as the best way to solve growing problems in this field. In terms of costs it all seems that a case-by-case analysis is more expensive due to the logistics and personal that is needed in the referred assessments.

When talking about telecommunications we have to realize that using competition law to correct the earlier monopolies and high volume of subscribers would be an unsuitable method. The solution was to impose in an ex-ante situation a mandatory obligation to interconnect and to create suitable and specific ex-ante regulations to enhance the competitive process.

Not imposing a mandatory obligation to interconnection would give rise to a high market share to one of the market actors. Leading possibly to a tipping case. In the interoperability and software situations, giving a high protection to interfaces is comparable to the telecommunications case in the way that it will give rise to high market shares for one of the market actors and eventually tipping the market.

It seems that a proper ex-ante correction of market power is substantially more assertive than an ex-post one. When looking at article 102 TFEU a high market power and dominant position per se is not forbidden[199]. Market actors can achieve a dominant position by its higher innovation and better competitive processes, only the abuse of a dominant position has repercussions. However, high market power by itself can have negative repercussions on the competitive process[200].

Analysing article 106 TFEU we can perceive that the Member States also have an obligation to do ex-ante regulations and to enforce it in order to enhance the competitiveness in the market.

Article 106 (1) states: "In the case of public undertakings and undertakings to which Member States grant special or exclusive rights, Member States shall neither enact nor

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[199] See, *supra not*e 21; pp.179-181.

[200] See, *supra note* 189; pp.607-621.

maintain in force any measure contrary to the rules contained in the Treaties, in particular to those rules provided for in Article 18 and Articles 101 to 109."[201]

The application of article 106 TFEU is a complementary article to article 102 TFEU. The problem is that the application of this article is directed to exclusive rights granted by the States. IP rights are not exclusive rights granted by States to an undertaking and applying this article to interoperability matters and copyrights is not possible. However, we cannot disregard the comparison of the exclusive rights and the broad IP protection given to interfaces. We should take into account the ex-ante regulation given in article 106 TFEU[202] and possibly create a legislation based on these principles to the interoperability case, giving more responsibility to the Member States and decreasing the number of cases that fall into the competition authorities' hands.

If it is predictable that the lack of ex-ante legislation will lead to high market power and dominance, States should be called to legislate and contribute to enhance market competition in this field.

Looking at the telecommunications legislation[203] we can perceive that at the time of its creation there was an awareness that the high number of subscribers of one company[204], would lead to a lack of competition and foreclosure of the market and ex-ante steps were taken to prevent it such as: the mandatory interconnection. In the interoperability case, even if there was no previous awareness of this interoperability importance and relevance, it should now be[205]and new forms of regulation are needed.

It is of some importance to mention that the natural flow of the market should be in a first place, the creation of ex-ante regulations that will possibly generate a competitive market that then will be monitored by the competition authorities.

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[201] Article 106 TFEU.

[202] Ibid.

[203] Directive 2002/21/EC.

[204] Due to the previous monopoly power given and accepted by States.

[205] Due to the ever growing development in technology and the importance of interoperability between technological products. In the present day there is an increasing dependence on technology and in the future it might be seen as something indispensable to the normal function of the society in general.

The rules to interconnection according to the Access Directive are of a permanent basis and not temporary[206], this takes into account the relevance of such interconnection not only to disperse the initial high market power and connections that date to the monopoly era but also to increase competition and innovation in the future.

It must exist a high level of certainty for new competitors that desire to enter in the market; otherwise, small competitors will be reluctant to enter in the market due to the lack of certainty. The interconnection obligations are a must in the telecommunications industry[207] due to the strong effects of networking. Without a previous certainty of connection to the other operators and even if a new company provides better services and lower prices it is nearly impossible to effectively pierce into the market due to the reluctance of consumers to migrate to a company with low networking effects.

An ex-post protection through competition authority does not give the required ex-ante certainty to new entrants; only ex-ante regulations will do the job. In the software industry the case is similar and an ex-ante protection would also be a good way of giving certainty. We should also consider that due to the uniqueness of both sectors (telecommunications and software) specialized regulations and standardization (in interconnection and interoperability) are necessary to increase the competitiveness in both sectors.

1.3. Telecommunications Law as the basis for the Software Directive Amendment

It will be further discussed and analysed what are the mechanisms of telecommunications law and its relevance for a possible amendment and changes to the Software Directive.

The New Regulatory Framework (NRF)[208] came to supersede the older regulatory frameworks in telecommunications law. The Framework Directive is a first approach to the role of the Commission and of the National Regulatory Authorities (NRA), as the Access Directive is the directive that specifies the access to the networks.

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[206] Directive 2002/19/EC of the European Parliament and of the Council of 7 March 2002.

[207] Directive 2002/22/EC para. (8) and (25).

[208] Regulatory Framework for Electronic Communications.

Telecommunications law is aimed at solving temporary and permanent problems of connection and network.

As already referred, due to the type of industry and its network effects relevance there needs to exist certainty and at the same time flexibility, because new operators that want to access the market need to know that they will be able to interconnect with other operators (that already have many subscribers). Also, there needs to exist flexibility due to the complexity of interconnection costs and the uniqueness of those contracts.

Accordingly to article 4(1) of the Access Directive, in a first situation there needs to be made a commercial contract approach between the operators:

Article 4(1) states: "Operators of public communications networks shall have a right and, when requested by other undertakings so authorised in accordance with Article 4 of Directive 2002/20/EC (Authorisation Directive), an obligation to negotiate interconnection with each other for the purpose of providing publicly available electronic communications services, in order to ensure provision and interoperability of services throughout the Community. Operators shall offer access and interconnection to other undertakings on terms and conditions consistent with obligations imposed by the national regulatory authority"[209]

This obligation to negotiate interconnection access does take us into remembering the Software directive that also has the mechanisms to provide interoperability[210]. However, none of those two mechanisms provides practicable terms to the weaker part.

When analysing article 5 of the Access Directive we can perceive that the NRF imposes obligations to the NRA to control and regulate the interconnection between the different market operators, this is, it can intervene in the negotiations and assure that they are developing them in a correct way and that interconnection is going to be achieved.

Unlike the Software directive, and copyright law, where both grant high levels of protection to the software interfaces, in the telecommunications law, the control over the interconnection interfaces is restricted and limited.

Article 5 (1) reads: "National regulatory authorities shall, acting in pursuit of the objectives set out in Article 8 of Directive 2002/21/EC (Framework Directive), encourage and

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[209] Directive 2002/19/EC (Access Directive); article 4 (1).

[210] Directive 2009/24/EC; article 6.

where appropriate ensure, in accordance with the provisions of this Directive, adequate access and interconnection, and the interoperability of services, exercising their responsibility in a way that promotes efficiency, sustainable competition, efficient investment and innovation, and gives the maximum benefit to end-users. In particular, without prejudice to measures that may be taken regarding undertakings with significant market power in accordance.

(ab) in justified cases and to the extent that is necessary, obligations on undertakings that control access to end users to make their services interoperable."[211]

We can perceive that the NRA has an important role on controlling the application of the telecommunications law and that the services must be interoperable, this is, one of the cornerstones of the NRF on telecommunications, is all about increasing and securing effective market competition and interconnection.

The creation of a regulatory authority to control the interoperability in the software area could be an idea to retain from the telecommunications law example. It would be a mechanism to ensure that negotiations to grant access to interface information's are conducted in a correct and equal way.

There is in fact a mechanism that is used to gain interoperability: the reverse engineering and decompilation provisions, however, those mechanisms do not always ensure interoperability, and they are also a very expensive way of reaching it. One other solution could be the modification of the provision that prohibits sharing the reverse engineering results. Companies should be able to share those costs.

Another telecommunications method of ensuring interconnection is the reference offer to which we should pay some attention and possibly duplicate it into the Software directive.

Article 9 (2) reads: "In particular where an operator has obligations of non-discrimination, national regulatory authorities may require that operator to publish a reference offer, which shall be sufficiently unbundled to ensure that undertakings are not required to pay for facilities which are not necessary for the service requested, giving a description of the relevant offerings broken down into components according to market needs, and the associated terms and conditions including prices. The national regulatory authority shall, inter

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[211] Directive 2002/19/EC (Access Directive) article 5.

alia, be able to impose changes to reference offers to give effect to obligations imposed under this Directive."

The reference offer is intended to protect the weaker parts that enter into negotiations. It is a clause that ensures non-discriminatory methods of negotiation and accelerates the process, the NRA can intervene in this process, obligating the operators to amend or change the reference offers. This process makes it more difficult for whole operators with negotiating advantages to slow down the process.

This process of creating a reference offer should have good effects in the software directive. Taking into account that the software market is characterized by the strong network effects, companies with big market shares can easily use their strong negotiating power to slow down the interoperability negotiations, and apply unequal terms. If there were an NRA it could also intervene in the negotiating process and eventually correct contractual deficiencies, accelerating the process and making it more anti-discriminatory.

2. Conclusions

Through the analysis of what was previously written we can state that interoperability is a subject of major importance in the technological world. The high value of networking in the IT market leads to an ever growing discussion on the level of protection that should be given to interfaces.

On one hand, low protection of interfaces can lead to a decrease of innovation; on the other hand, high protection of interfaces can lead to an increase of product prices and the appearance of monopolies detrimental to competition.

The current laws are ill suited to keep up with the fast growing technological market. When a technology is developed it boosts not only the technology of its current sector of activity but also many other sectors. That new technology is many times used to develop numerous other technologies and this leads to a snowball effect. The world as never experienced so much technological development as in the past few years. For example: When the smart phone was invented and introduced in the market, it led to the creation of other

technologies by other inventors, the apps, the countless accessories that improve the smart phone, toys that interact with the smart phone, furniture and automobiles that connect with the smart phone, etc.

There are methods to gain access to interfaces but in the authors' point of view, those methods are many times disproportionate in what concerns the relation of costs/effectiveness.

The methods of reverse engineering and decompilation are associated with the Software directive in articles 5 and 6. But as we saw, the costs and time spent in those processes do not grant any certainty in achieving interoperability. The software right holder can change at any time the interoperability information leaving the other part with more expenses in decompiling and reverse engineering the same program. This situation seems rather unfair to the part that incurred into costs with the processes of decompiling and reverse engineering.

The Software directive does not include any kind of obligation to disclose interoperability information it only provides solutions (not mandatory) to achieve it. The problem is when a company does not possess the monetary fund's to enter in such activities of decompilation and reverse engineering. One might argue that it can enter into negotiations with the right holder to enter into a licensing agreement; however, there is no obligation of the right holder to provide such licensing agreement.

We cannot forget to mention that the Software directive prohibits the disclosure of information achieved through decompilation and reverse-engineering, this is, small companies cannot come together to share the costs of this operation.

Competitors cannot engage in the processes of decompilation and reverse engineering when the information is readily available [article (6) (1) of the Software directive], the problem here lies with the lack of information in ascertain the amount of the information that needs to be disclosed in order to prevent the processes above mentioned.

In the authors view, it would be beneficial to provide some changes to the software directive such as: inclusion of more detailed information about the quantity of readily available information to be disclosed in order to prevent decompilation and reverse engineer; allow competitors to share the costs of decompilation and reverse engineer; give higher

certainty to competitors that dispend time and money in decompilation and reverse engineer[212].

The author sees that problems of interoperability should be addressed mainly in an ex-ante situation, leaving the ex-post intervention as little as possible. The telecommunications law is a good starting point and a good reference to give some possible changes to the Software directive.

We cannot forget that the market flow is made: in a first instance with the creation of good and effective ex-ante regulations and only in exceptional cases with the intervention of the ex-post authorities to correct market failures. Also, good ex-ante regulations give higher certainty and security to future investors, subsequently increasing the market competition.

In a first instance it should be implemented an article where the definition of market power is given and where a certain undertaking or joint undertakings have a market power that will decrease effective competition. In a second phase, it should be given to Member States, power to correct the market failures and remove the high market power from the undertaking/undertakings mentioned above.

It should be given to Member States power to encourage and if necessary mandatorily implement standards of interoperability.

To Member States should also be given the ability to impose mandatory obligations to undertakings to enter into licensing agreements in order to achieve interoperability. The Member States should create a competent authority to give proper and fair values to the agreements mentioned. Everything that was mentioned should have as a corner stone the publicity of the information's in what concerns market power, interoperability standards and licensing agreements costs as well as all public interventions made in this sector.

It would be of some importance to implement a non-discriminatory clause as well as a proportionality clause to protect undertakings with less influence or monetary power

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[212] For example, if a competitor decompiles or reverse engineers a program, it should be given a period where if the right holder changes the interoperability information, that information should be granted to the competitor free of costs.

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