INTEROPERABILITY AND REGULATION IN THE TECHNOLOGY MARKET: A COMPETITION ANALYSIS

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JUNE 2012

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Submitted to the Competition Commission of India
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Shubhneet Inderjit Kaur
ACKNOWLEDGMENT

For the preparation of this project report, I extend my gratitude towards Dr. Sanjay Kumar Pandey Joint Director (Law). His guidance and efforts have helped me complete the report in time. His valuable inputs and constant encouragement have to be acknowledged.

I also put on record my gratitude towards the library staff, which has provided me help and access to all the resourceful material for my research. Also, the staff of Dr. Pandey has always extended kind help for a good experience at the Competition Commission of India.

I also thank the Competition Commission of India of India for providing me with the opportunity to intern and learn.

Shubhneet Inderjit Kaur

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July 2\textsuperscript{nd}, 2012
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<th>Abbreviation</th>
<th>Full Form</th>
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<tr>
<td>Art</td>
<td>Article</td>
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<td>CAM</td>
<td>Conditional Access Modules</td>
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<td>CCI</td>
<td>Competition Commission of India</td>
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<td>DRM</td>
<td>Digital Rights Management</td>
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<td>DTH</td>
<td>Direct To Home</td>
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<tr>
<td>ECHR</td>
<td>European Commission of Human Rights</td>
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<td>EU</td>
<td>European Union</td>
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<td>ICT</td>
<td>Information and Communication Technology</td>
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<td>IPR</td>
<td>Intellectual Property Rights</td>
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<td>IT</td>
<td>Information Technology</td>
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<tr>
<td>OS</td>
<td>Operating System</td>
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<td>TRAI</td>
<td>Telecom Regulatory Authority of India</td>
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- FICCI MULTIPLEX v. UNITED PRODUCERS/ DISTRIBUTORS FORUM Case No. 1/2009, Decided on 25.05.2011; 2011 Comp LR 0079 (CCI)
- GROPPERA RADIO & OTHERS v. SWITZERLAND, Judgment of 28 March 1990 (No.173), 12 EHRR 321
- IMS HEALTH GMBH & CO. OHG v. NDC HEALTH GMBH & CO. KG, European Court of Justice, Case C-418/01, 29 April 2004.
- UNITED STATES OF AMERICA v. MICROSOFT CORPORATION, 87 F. Supp. 2d 30, DDC 2000
- VOLVO v. VENG [1988] ECR 6211 at paras.8-9, Case 53/87
Chapter 1: INTRODUCTION

Interoperability may be defined as the ‘ability to exchange information and mutually use the information which has been exchanged.’

Interoperability, like openness, is something that we generally think of as a “good thing” in the context of technology market as it leads to innovation, as well as consumer choice, ease of use, and last but not the least competition in the market. However, there is no one-size-fits-all way to achieve interoperability especially in the technology context. Interoperability does not mean the same thing in every context. And the relationship between interoperability and innovation, while it likely exists in most cases, is extremely hard to prove.

There are a wide range of approaches that have relative merits and can be adopted depending upon the circumstances which include efforts within a single firm to interconnect products or within firms; collaboration between or among two or more firms; standards processes, including open fora and ad hoc cooperation; and a wide range of roles for governments, most of which are ex post rather than ex ante modes of regulation. In various contexts, one or more of these approaches may be the best suited to accomplish the goal of interoperability.

1.1 ISSUES WHICH NEED TO BE ANSWERED

⇒ What role does government or regulators or competition authorities play in encouraging or mandating interoperability

⇒ How lack of interoperability affects competition and innovation in the technology market.

⇒ What problems arise when one dominant player with substantial market power controls technology needed to support interoperability, can the essential facilities doctrine be applied.

⇒ How technologies for protecting copyrighted works, often called “digital rights management,” affect interoperability and its contribution to innovation and economic growth.

⇒ What are the problems consumers face if they are “locked in” to a system that is not interoperable.

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1 Software Directive, §10; Mc Kean 2005
1.2 WHAT IS INTEROPERABILITY:

In today’s “information society”, most — if not all – commonly used information technology products must be able to communicate, or “interoperate”, in networks with other IT products. There is often confusion over the meaning of “interoperability” in today’s information technology markets, and over the relationship between “interoperability” and “competition.”

At the outset, it is pertinent to define and understand the concept of interoperability. In the technology market, it is defined as the ability of a system to work with or use the parts or equipment of another system. It is when consumers, producers, or service providers can make two or more devices, systems, or networks work together, the systems are said to be “interoperable.” Interoperability issues often arise when systems or products offered by different firms are deployed simultaneously in the same market to compete with each other.

The most efficient way of building interoperability is by using “open standards”, advocated by great thinkers, as it describes how different products can be made to work together harmoniously. In this globalised and technological driven world, interoperability standards by facilitating compatibility between products and systems, scaffold the growth and proliferation of networks, both real and virtual. They enable machine-to-machine

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4 YOCHAI BENKLER THE WEALTH OF NETWORKS, Yale University Press, 2006
5 The term is often used in discussing hardware like telephones or medical devices, software, and computer records, but issues relating to interoperability also arise in traditional sectors, such as railroads. Some systems are interoperable by design or even government mandate
6 The standards are “open” in being available for use by any appropriate technology developer, available at http://www.appropedia.org/Open_Source_Appropriate_Technology June 14, 2012
interaction; permit programs to “speak” to one another, and allow information exchange between different applications and platforms.\(^9\)

For instance, the internet itself is such a system, supported by the Internet Protocol (IP) and Transmission Control Protocol (TCP) standards. Other systems become *de facto* interoperable as various economic actors independently decide to use compatible technologies or a single technology, like Microsoft Word boosting the competition in the market. On the other hand, there are some products which are designed to usually disallow interoperability without permission having intellectual property rights as their face-saver or legal defence to foster innovation in the market.\(^10\)

### 1.3 SOFTWARE INTEROPERABILITY

“The ability of one technology to interact with another technology in order to implement some useful functionality”\(^11\)

Software is the set of instructions aimed at having computer hardware perform a specific task,\(^12\) thereby turning versatile but idle machines into useful tools. Software is used to control general-purpose computers, such as desktop, laptop and handheld PCs, and devices with specific purposes, such as televisions, washing machines, cameras and aircraft. Software also controls more complex systems, such as internet, defense systems and air traffic control.

Software Interoperability is simply the ability of software and hardware on different machines from different vendors to share data.\(^13\) Therefore, it is a two-way process rather than a single one. It is explicit that it is the ability of a computer system to run application

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\(^9\) As in the case of document formats or structured data standards
\(^12\) BAND & KATOH 1995 pg. 3; European Commission 1988, §5.1.1; National Commission on New Technological Uses of Copyrighted Works 1978, p. 9
\(^13\) Available at http://www.webopedia.com/TERM/I/interoperability.html last visited on June 15, 2012
programs from different vendors, and to interact with other computers across local or wide area networks regardless of their physical architecture and operating systems. Interoperability is feasible through hardware and software components that conform to open standards such as those used for internet.\textsuperscript{14} Technically, interoperability is achieved through special parts of the computer program called \textit{interfaces}.\textsuperscript{15}

Moreover, application programs need to interoperate with the computer’s operating system; different application programs need to read and write each other’s file formats, program modules call on each other’s functionality, and programs on different computers must communicate with each other using common network protocols. The terms \textit{interconnection} and \textit{compatibility} are sometimes used to indicate connections between systems at a lower, mechanical level (rather than a higher, logical level), such as telecommunications.\textsuperscript{16}

\textbf{1.4 INTEROPERABILITY AND INTERDEPENDENCY: A BETTER UNDERSTANDING OF THE CONCEPT}

Interoperability in the technology market especially in the computer industry is a big deal, and lack of interoperability even more so. Whereas most people unconsciously rely on interoperability between computer programs every day, many others will recall instances of unreadable e-mail attachments, presentations that failed to display on the projector or word processing documents that were delivered by the printer in an unreadable form. In such instances, it might have crossed the mind of the frustrated computer user that the lack of interoperability was perhaps deliberate and that whoever caused it probably sought to persuade the user to switch to a different vendor or to upgrade to a new version- both of which typically come at a price.

A fully functional computer system, comprising the computer hardware, an operating system and application programs, such as word processor, is a function of tens of thousands of interoperating hardware and software components. All components must be designed to

\textsuperscript{14}Definition of Interoperability, available at http://www.businessdictionary.com/definition/interoperability.html February 11, 2012
\textsuperscript{15}Software Directive §10
\textsuperscript{16}STAFFELBACH 2003, pg. 69
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interoperate seamlessly with one another, or the system could malfunction, or functionality offered by one component could be left unused as other components fail to respond to it.\textsuperscript{17}

In addition to this type of \textit{vertical interoperability} – or interoperability between components of a single computer system or software, in which each component serves a distinct purpose- \textit{horizontal interoperability} denotes interoperability between components on different computer systems.\textsuperscript{18} This enables users to communicate and exchange documents- for instance, by e-mail or instant messaging – and to connect computers in a local or a worldwide network, such as the internet. As more people use a particular product, such as a word processor from a particular vendor, the value of that component or product increases for other users as well. This is known as a \textit{network effect}.\textsuperscript{19} Network effects denote an increase in value as more people consume the good; the value of a network good is, in other words, a function of its number of users.\textsuperscript{20} Thus, prices and qualities of two products being equal, consumers would prefer the product with the larger network benefits. The presence of network effects in software can have a profound impact on its innovation and dissemination and on consumer welfare.\textsuperscript{21}

This vertical and horizontal interdependency of components in the technology industry is remarkable because many of the components of the user’s computer system are manufactured by different firms. This implies a substantial degree of co-ordination among vendors, as they must design their products according to a set of detailed, common rules, or \textit{interfaces}, in order to provide for interoperability.\textsuperscript{22}

Although such interdependency is not unique to the technology industry, the \textit{degree} of interdependency- particularly in horizontal relationships- probably is. In most other markets, the players in that market innovate and compete largely independently of each other. These players, therefore, are not dependent on each other’s particular products. For example, film studios create their own movies and are not generally technically dependent on films created by competing studios. \textit{By contrast}, computer programs structurally need to offer horizontal

\begin{itemize}
\item \textsuperscript{17} \textit{Infra} at 28
\item \textsuperscript{18} LEA & HALL 2004, p. 73
\item \textsuperscript{19} MARK A. LEMLEY et al., Software and Internet Law, Gaithersburg: ASPEN LAW & BUSINESS 2000
\item \textsuperscript{20} FARELL & KLEMPERER 2004, p. 2007; KATZ & SHAPIRO 1998, p. 3; SHAPIRO & VARIAN 1999, p. 174
\item \textsuperscript{21} KATZ & SHAPIRO 1994, p. 106
\item \textsuperscript{22} ROBINSON & CARGILL 1996.
\end{itemize}
**Interoperability and Regulation in the Technology Market: A Competition Analysis**

Interoperability: one vendor’s word processor ideally should be able to exchange documents with another vendor’s word-processing program. This type of horizontal interdependency is not typical in many markets, where, instead, independency is the general rule. Of course, in many markets, vertical relationships among the suppliers similarly require substantial interdependency.\(^{23}\)

Hence, ‘Interoperability’ means functional interconnection and interaction, as 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 or simply the ability to exchange information and mutually to use the information which has been exchanged.\(^{24}\)

**Chapter 2: SOFTWARE INTEROPERABILITY AND COMPETITION LAW**

It is crystal clear from the above narrative that the substantial interdependency on interoperability in the software industry cannot be overlooked as it significantly affects innovation and competition in the market. It can also be further elucidated by the following postulates. Firstly, software developers cannot innovate completely independently because their products must interoperate with those of others. Thus, innovation, to some extent, is limited by requirements determined by competitors or by industry associations. In particular, interfaces of competitors must be copied in order to enable interoperability with their products. Secondly, firms cannot compete entirely independently because the need for interoperability among their products causes a need for co-ordination and sharing of information. Moreover, if a firm cannot offer interoperability with existing and widely used components, its product might have no chance of success, and the firm could, therefore, abandon competition and new-product development altogether. In sum, the interdependency and standardisation in the software industry alters both innovation and competition.

The relevant laws addressing innovation and competition concern primarily intellectual property rights and competition rules. Because the technology industry is regulated by the


\(^{24}\) Software Directive, Recitals 10-12. In contrast, interoperability in the DTV market, for instance, has been taken to mean the disappearing of authoring costs (which would be incurred in translating applications from the API for which they were written to another) or the situation in which any application can be run on any STB middleware and APIs. See OXERA, ‘Study on Interoperability, Service Diversity and Business Models in Digital Broadcasting Markets’ February 2003, pp.6-7.
same laws on intellectual property and competition as other industries, the application of these laws could jeopardise the need for standardisation and interoperability in the software industry.\textsuperscript{25} This is a problem for an industry that is so firmly based on a need to coordinate, standardise and interoperate.

Whereas intellectual property and competition laws thus generally stimulate a model of independent innovation and competition, there are exceptions elsewhere in the law. Telecommunications law, for example, recognises the structural interdependency in the telecommunications industry.\textsuperscript{26} It does not require competing networks to operate completely independently but, instead, prescribes competing networks to interconnect.\textsuperscript{27} By the same token, design protection laws recognise that, particularly in the automotive industry, there similarly is a substantial degree of vertical interdependency in parts, which has resulted in special provisions related to interconnections between product and spare parts protected by design protection laws.\textsuperscript{28}

The distinction between the effects of interoperability and non-interoperability is certainly not as black and white as may be implied. Interoperability may also stimulate significant innovation.\textsuperscript{29} For new market entrants, keeping interfaces open and safeguarding interoperability may be an important ‘driver’ for their new platform, if other firms develop complementary products for a platform due to its open interfaces, the popularity of the platform may increase more rapidly (vertical interoperability).\textsuperscript{30} Conversely, follow-on innovation may be stimulated by open interfaces, as a follow-on innovator can expect a large audience for the new product.\textsuperscript{31} Indeed, the economic purpose of a standard is to ‘freeze’ development in one stage in order to enable or accelerate innovation in a second stage. Thus, standardisation removes the uncertainty about the outcome of the innovative process, thereby

\textsuperscript{25} Owing to Intellectual Property Rights
\textsuperscript{26} The essential facilities doctrine is often resorted to in the telecommunications sector.
\textsuperscript{29} SCOTCHMER 2004, p. 304
\textsuperscript{31} Large firms can also benefit from open interfaces. For instance, IBM’s use of open interfaces accelerated support for its new PC platform
facilitating follow-on innovation. The internet, in particular, is a sublime example of an innovation driver based on open standards.\textsuperscript{32}

Because interoperability can substantially affect the form of competition, it can also significantly affect market power. Due to strong network effects in software, consumers seek to maximise their network benefits. If the different manufacturer’s products are not interoperable (controlled interfaces), consumers, therefore, will tend to choose the brand with the largest number of other users. The market may eventually tip to that product. Such tipping reduces competition from other firms, causing substantial market power. Competitors anticipate this and, therefore, may compete for that tipped position. By contrast, with interoperable products, firms compete in the market, and the market power of any one firm may be less substantial. Due to interoperability, rather there being competition \textit{FOR} the market, there shall be competition \textit{IN} the market which is not only beneficial to the consumers but also the economy as a whole.

\textit{A Case In Point: The Windows Monopoly and Interoperability:}

The European Commission Decision of March 24, 2004\textsuperscript{33} found Microsoft’s refusal to supply interoperability information to other market participants was held to be a violation of Article 82 of the European Treaty prohibiting the abuse of a dominant position as European consumers were locked into a Microsoft Windows environment.\textsuperscript{34} In other words, Microsoft used interoperability \textit{not} to expand competition and consumer choice but to limit both. Therefore, Microsoft was ordered to provide essential interoperability information to permit the development of competing products.\textsuperscript{35} Even in the US\textsuperscript{36}, it has suffered the same fate where it was held that it has consistently and flagrantly abused its power and violated the law to the detriment of competition, consumers and innovation.\textsuperscript{37}

\begin{itemize}
\item \textsuperscript{32} CARR 2008, p. 107, FRISCHMANN & WEBER-WALLER 2008; WEISER 2003
\item \textsuperscript{33} Case T-201/04, MICROSOFT CORP. v. COMM’N, 2004 E.C.R. II-4463
\item \textsuperscript{34} Interlocking monopoly systems and products based on its proprietary Windows standards allow Microsoft to prevent the interoperability of competing products by refusing to supply the essential information to would-be competitors. Microsoft thereby limits competition with its dominant monopoly products.
\item \textsuperscript{35} Microsoft seeks to extend the same illegal behavior to the next generation of its dominant products: Windows Vista, Office 2007 and Longhorn Server
\item \textsuperscript{36} UNITED STATES OF AMERICA v. MICROSOFT CORPORATION, 87 F. Supp. 2d 30, DDC 2000
\item \textsuperscript{37} PHAM, ALICE (2008), ‘NEW ‘WINDOWS’ ON COMPETITION THE MICROSOFT CASE’, CUTS International, Jaipur, India
\end{itemize}
Chapter 3: STATUTORY PROVISIONS OF VARIOUS LEGISLATIONS AS REGARDS INTEROPERABILITY (INDIAN AND EUROPEAN UNION)

3.1 THE INDIAN POSITION

We have already noticed that the principal objects of the Competition Act, in terms of its Preamble and Statement of Objects and Reasons, are to eliminate practices having adverse effect on the competition, to promote and sustain competition in the market, to protect the interest of the consumers and ensure freedom of trade carried on by the participants in the market, in view of the economic development in the country. In other words, the Act requires not only protection of free trade but also protection of consumer interest.  

Competition is an evasive term, and its understanding differs depending on the context. This may be the reason that the Competition Act, 2002 does not contain any definition of the term competition. Competition means a struggle or contention for superiority, and in the commercial world, this means striving for customers and businesses in the marketplace. Competition policy is defined as “those Government measures that directly affect the behaviour of the enterprise and the structure of the industry”. Thus, competition policy is a comprehensive term and it is difficult to draw a boundary around it. However, the following provisions are relevant in addressing the issue of interoperability and its regulation in the technology market:

✓ Preamble: Competition Act was passed to overcome the lacunae in the existing MRTP Act and to shift the emphasis from ‘eliminating monopolies’ to ‘promoting competition’.

38 CHIEF JUSTICE S H KAPADIA , COMPETITION COMMISSION OF INDIA v. STEEL AUTHORITY OF INDIA LTD. AND ANR (2010)10SCC744
42 RAKESH BASANT AND SEBASTIAN MORRIS, COMPETITION POLICY IN INDIA: ISSUES FOR A GLOBALISING ECONOMY, ECONOMIC & POLITICAL WEEKLY, July 29, 2000, 2735
Section 3(5): Intellectual Property Rights can be used as a sole defence against all anti-competitive agreements covered under Section 3(5). The Act protects rights that have been conferred upon a person under the Copyright Act, 1957, the Patents Act, 1970, the Trade and Merchandise Marks Act, 1958, the Geographical Indications of Goods (Registration and Protection) Act, 1999; and the Semi-Conductor Integrated Circuits Layout and Design Act, 2000.  

Section 3: India follows the ‘effects’ doctrine as well as the ‘rule of reason’ doctrine. Any agreement which limits competition by not allowing interoperability and thereby causes appreciable adverse effect on competition is void within the meaning of this Section.

Essential Facilities Doctrine: Essential facilities can be defined as facilities or infrastructure that are essential for reaching customers and/or enabling competitors to carry on their business, and which cannot be replicated by any reasonable means. Thus, in certain cases a dominant undertaking must not merely refrain from anti-competitive action but must actively promote competition by allowing potential competitors access to the facilities which it has developed.

Section 4: Section 4 dictates that dominance does not constitute an offence until it is abused by resorting to unlawful practices such as limiting technical or scientific development or when one dominant player on one relevant market uses its position to enter into, or protect another relevant market. It is also hit when a dominant player refuses to supply information for interoperability.

3.2 THE EU POSITION

The EU law perspective focuses on the relationship between national intellectual property rights and the competition laws, rather than their substance or effects. Intellectual property rights are covered by the EU Software Directive, Article 10 ECHR and Article 82 dealing with abuse of dominant position.

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43 THE PROTECTION OF PLANT VARIETIES AND FARMER’S RIGHTS ACT, 2001 does not feature here.
44 Section 3(3) (b) limits or controls technical development
45 Section 3(4) Refusals To Supply And The Essential Facilities Doctrine
46 Article 10 ECHR: right to freedom of expression
Software regulation raises Art.10 issues in two respects. First, in *Autronic*, the European Court of Human Rights (ECHR) recognised that ‘Art.10 applies not only to the content of information but also to the means of transmission or reception since any restriction imposed on the means necessarily interferes with the right to receive and impart information.’ Second, disseminating software also constitutes an expression of information or ideas in its own right, in the sense of Art.10(1) ECHR. The Court subscribes to a very broad construction of the terms ‘information’ or ‘ideas’ by avoiding any restriction on their ambit. In *Groppera*, for instance, it did “not consider it necessary to give on this occasion a precise definition of what is meant by ‘information’ and ‘ideas’.

On the other hand, For Art.82 to apply, three conditions need to be fulfilled. First, there needs to be a dominant position. That dominant position needs to be abused. Finally, this should impact a substantial part of the common market. The third condition is not a problem in relation to access to bottleneck facilities. the Commission has made clear in relation to access to an airport facility that ‘it is important to stress that a port, an airport or any other facility, even if it is not itself a substantial part of the common market, may be considered as such in so far as reasonable access to the facility is indispensable for the exploitation of a transport route which is substantial.

A conflict between competition law and copyright law may arise if competition law is applied to a refusal to supply interface specifications of copyrighted software. As regards IPR, the
general rule is that a refusal to supply cannot in itself constitute an abuse. In Volvo, the car manufacturer instituted proceedings against the defendant for infringing its registered design on replacement parts for its cars. In that case the court recognised that exclusivity was the essence or substance of the design right. It was not an abuse of a dominant position for a car manufacturer holding the registered design for body panels for its cars to refuse to license others to supply replacement panels necessary for the repair of the cars, even in return for a reasonable fee.  

Chapter 4: INTEROPERABILITY - COMPETITION AND INTELLECTUAL LAW INTERFACE

Imagine that, in a faraway fictitious land, A expresses a series of words that have no synonyms and only make sense in that particular sequence. In order to utter competing or complementary expression, B and C need to ‘borrow’ that exact same series of words. As it turns out, that country’s intellectual property rights will determine whether or not A is able to monopolise or control all debates using that series of words. By analogy, B and C need access to A’s interface information if they want to create software programs capable of interoperating with A’s software. For the ‘interface’ is a set of electronic keys that, so far as structure is concerned, must be precisely emulated in order to secure co-operation between programs.

Whenever we harp upon the concepts of software interoperability and competition law, following questions arise: (i) how interoperability affects the balance between innovation and free competition in software; (ii) which of two regimes - copyright law (IPR) or competition law - primarily should be concerned with striking this balance as affected by interoperability (iii) which particular instruments are suitable to approach this problem within these respective regimes.

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53 IMS HEALTH GMBH & CO. OHG v. NDC HEALTH GMBH & CO. KG, European Court of Justice, Case C-418/01, 29 April 2004.
To answer these questions, an understanding of both the laws, anti-trust and intellectual property laws is vital. In India, the Competition Act, 2002\(^{56}\) is the governing law which provides intellectual property rights as an exception\(^{57}\) but only reasonable conditions can be laid down in exercising its right. In particular, the eyes of lawyers, economists and policy-makers have been drawn to the way in which intellectual property rights (IPR) over interoperability standards can result in technological bottlenecks, leading to reduced competition and the potential for consumer harm.\(^{58}\) The root of this concern stems from the uneasy reconciliation of two aspects of interoperability standards: that they should both incorporate leading-edge technology\(^{59}\) as well as be generally available and accessible for implementation.

In the *FICCI Multiplex case*,\(^{60}\) the CCI was confronted with a situation wherein parties claimed their rights under Section 3(5) and wanted to be exempted from the application of the Act. The CCI, however, noted that “intellectual property laws do not have any absolute overriding effect on the competition law. The extent of the non-obstante clause in Section 3(5) of the Act is not absolute as is clear from the language used therein and it exempts the right holder from the rigours of competition law only to protect his rights from infringement. It further enables the right holder to impose reasonable conditions, as may be necessary for protecting -such rights.”\(^{61}\)

Exclusive rights do not pose problems to the software ecosystem as long as the rights can be clearly separated from each other and the creators of new programs are not dependent upon the rights of others. Unfortunately, the implementation of even a simple computer program in the systems that are in use today typically depends on software components from many others. Thus, one company or independent developer can hardly produce a complete software

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\(^{56}\) Act 12 of 2003 dated 12th December, 2003

\(^{57}\) Section 3(5) of THE COMPETITION ACT, 2002


\(^{60}\) Case No. 1/2009 – against United Producers/Distributors Forum, decided on 25.05.2011: 2011CompLR0079(CCI) (The case related to alleged cartelization of producers/distributors of films and giving a boycott call against Multiplexes Association of India)

\(^{61}\) ibid, para 23
product alone and without the explicit acceptance of others giving way to the grave need of interoperability in the technology sector.

The question whether intellectual property rights should be sacrosanct or potentially subject to mandatory access constitutes a challenge of the most profound importance for contemporary policy makers as the foundation of the entire new economy lies on the security of such rights, yet the exclusivity inherent in their employment carries considerable and explicit harm to consumers and allocative efficiency. Thus, the touchstone employed by the Competition Commission of India is the harm to the consumers and the competition of the country. Nevertheless, this challenge has been greatly addressed ex ante by the legislature and not merely ex post by courts or regulators, Competition Commission of India.

4.1 DIGITAL RIGHTS MANAGEMENT

Interoperability is also a matter of degree. In some cases interoperability information is available but only under restrictive and somewhat expensive licensing terms. The definitions and interpretations of the term “DRM interoperability” are manifold and heterogeneous. The EU High Level Group on Digital Rights Management, for example, defines the term as follows: In the context of DRM the term interoperability encompasses consistent functioning of the overall system including security and access, such that the system is able “mutually to use” information in the form of usage rules, content and technical measures “in all the ways in which they are intended to function”. This would apply even when content from different interoperable services is used and when such content is used on different interoperable devices. For the consumer, interoperability means he can choose different devices and use them with different services. For the content producer or content aggregator interoperability means he is not locked in to one distribution channel that forms a gatekeeper to the marketplace. For the device and ICT developer, interoperability means that his products can

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62 MIKKO VÄLIMÄKI, Ph.D, LL.M, Helsinki University of Technology, SOFTWARE INTEROPERABILITY AND INTELLECTUAL PROPERTY POLICY IN EUROPE
63 Section 18, Duties of the Commission
64 ALAN DEVLIN, MICHAEL JACOBS & BRUNO PEIXOTO, Success, Dominance, and Interoperability
be used with different content services – and that a gatekeeper does not form around a specific DRM technology.66

Apple's dominating music downloading service iTunes Music Store had brought interoperability debate in the sphere of portable music player market. Apple's music downloading service, iTunes is just one example of a closed Digital Rights Management system controlled by a single company or organization in a given market.67 For example, the so-called copy protected CDs have typically had proprietary DRM systems meaning that the discs can be played only on record label-specific software players. This is for example the case of DVD format, where DVD Copy Control Association controls the necessary information to produce compatible DVD players. Arguably, proprietary DRM systems are in general problematic to both consumers and competitors.

Apple’s closed DRM system: An instance
In the DRM music case study, for instance, it can be well illustrated how Apple had come up with an innovative piece of technology (iPod) and a technology-based service (iTunes Store) for online music distribution and consumption that has offered users substantial advantages over existing systems. Apple evidently believed that it was strong enough to create a sufficiently large network on its own. Consequently, Apple chose to market a non-interoperable technology over which it has retained strong proprietary control, thus contributing to a low level of interoperability on the online music market. Microsoft, in contrast, at least originally applied a different strategy by offering a proprietary technology68, but worked together with allies69 initiative to make the network larger and to profit in this way from positive feedback and network effects.

68 Windows Media DRM
69 Plays For Sure initiative
Thus in the Indian context with the laws in place, it has to be viewed from the perspective of the consumers and that the lack of interoperability does not cause appreciable adverse effect to the competition in the market especially the technology market which is complex and largely dependent upon interoperability. Various approaches can be employed by the Competition Commission of India for firstly, determining the relevant market and secondly, settling whether interoperability is required. These approaches have been discussed in the paper as part of the recommendations.

Chapter 5: DETERMINATION OF RELEVANT MARKET IN CASE OF INTEROPERABILITY

Delineation of “relevant market”\(^{70}\) is central to effective enforcement of competition laws. For the Competition Authority, such delineation clarifies the space within which it needs to adjudicate on competition cases. It is indeed the first step in the analysis of conduct on the part of the market players concerned.\(^{71}\) Relevant market is further classified into relevant product market\(^{72}\) and relevant geographic market.\(^{73}\)

‘Relevant Market’ refers to the line of commerce in which competition has been restrained and to the geographic area involved, defined to include all reasonably substitutable products or services, and all nearby competitors, to which consumers could turn in the near term if the restraint or abuse raised prices by a not insignificant amount\(^{74}\). Relevant market is defined by consumer or purchaser preferences and actions. For instance, if purchasers consider two

\(^{70}\) Section 2(r), THE COMPETITION ACT, 2002, “Relevant market” means the market which may be determined by the Commission with reference to the relevant product market or the relevant geographic market or with reference to both the markets;

\(^{71}\) Dr. S CHAKRAVARTHY, RELEVANT MARKET IN COMPETITION CASE ANALYSES, available at http://www.circ.in/pdf/Relevant_Market-In-Competition-Case-Analyses.pdf

\(^{72}\) Section 2(t), THE COMPETITION ACT, 2002, “Relevant product market” means a market comprising all those products or services which are regarded as interchangeable or substitutable by the consumer, by reason of characteristics of the products or services, their prices and intended use.

\(^{73}\) Section 2(s), THE COMPETITION ACT, 2002, “Relevant geographic market” means a market comprising the area in which the conditions of competition for supply of goods or provision of services or demand of goods or services are distinctly homogenous and can be distinguished from the conditions prevailing in the neighbouring areas.

goods to be close substitutes or readily interchangeable then those two goods are considered to be in the same relevant market.\textsuperscript{75}

There are various tests for determining the relevant market. Empirically, world practices have more or less converged to some form or the other of using the “SSNIP test”\textsuperscript{76}, also known as the “Hypothetical Monopolist Test” or the “5-10\% test”, to define relevant markets. The primary purpose of this test is to judge whether a ‘small but significant, and non-transitory’ increase in price (SSNIP) of a product would be profitable to a producer or not. Hence, if a hypothetical monopolist is able to profitably and permanently increase the price of his products by 5-10\%\textsuperscript{77} within a certain area, then this set of products marketed by him would constitute a separate relevant market, and other producers of similar products within that area would pose the chief competitive constraints. This test takes into account any and all products that pose significant competitive constraints to the firms involved in producing that product.\textsuperscript{78}

The Competition Act itself lays down various factors for determining the relevant market.\textsuperscript{79} However, as we understand after a competitive analysis of concept of interoperability, it can be concluded that it is often the ‘relevant product market’ rather than the ‘relevant geographic market’\textsuperscript{80} which needs to be determined. CCI in the sole case\textsuperscript{81} on interoperability had given its decision on the basis of relevant product market.

In terms of interoperability, the most important factors are \textbf{end-use of goods} as interoperability in the software market or as discussed below in the broadcasting sector shall allow consumers to make use of the products or applications in which lack of interoperability may be a hindrance. Secondly, the \textbf{price of goods or services} as if DTH is made

\begin{itemize}
\item \textsuperscript{75} Butter and margarine can be considered to be in the same relevant market.
\item \textsuperscript{77} A five percent price increase over a period of one year is given as a fair benchmark for most purposes, although higher or lower levels may be used depending upon the industry.
\item \textsuperscript{78} Product includes both goods and services.
\item \textsuperscript{79} Section 19(5) and (6)
\item \textsuperscript{80} Relevant geographic market can be given due regard when the same kind of services in the technology sector are not available to the consumers owing to the geographical differences.
\item \textsuperscript{81} CONSUMER ONLINE FOUNDATION v. TATA SKY LTD. & ORS Case No. 2/2009
\end{itemize}
Interoperability and Regulation in the Technology Market: A Competition Analysis

interoperable the consumers shall be saved of buying the set-top boxes again which will boost competition as the service providers, without any lock-in effect, will have to provide better services. There shall be no barriers to entry for new players and this sector shall become equally competitive as the telecom sector oozing of innumerable telecom operators. Thirdly, consumer preferences is an important touchstone as the consumer shall prefer that software which is most interoperable. This argument can be well supported by the popularity of Facebook as it allows more than 5000 applications on its platform. Fourthly, the existence of specialised producers as the lack of interoperability may then raise the barriers to the entry or foreclosure of competition by hindering entry into the market. Thus, these factors have to be analysed by the CCI in determining the relevant product market.

Chapter 6: INTEROPERABILITY IN SATELLITE BROADCASTING: CRITICAL ANALYSIS OF THE DTH DECISION BY CCI

Factsheet

The Competition Commission of India on March 23, 2011 in Consumer Online Foundation Vs Tata Sky Ltd. & Ors. had by a 6:1 majority decision inter alia, held that DTH Service providers have not indulged in unfair trade practices by denying nearly 20 million users an option to change operator under the Competition Act, 2002.

A consumer organisation, Consumer Online Foundation had filed a case with CCI, on the observation that DTH service providers—Tata Sky Limited, Dish TV India Limited, Reliance Big TV Limited and Sun Direct TV Pvt Limited—were acting against the spirit of competition by requiring consumers to purchase new set-top boxes every time they would want to switch between service providers. The providers had deliberately made sure that there is no interoperability in the DTH market.

The issue involved in the case was quite simple that whether the DTH operators by not allowing the consumer to switch to another operator due to refusal to provide

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82 Mobile Number Portability
83 Case No. 2/2009
84 Case No. 2/2009 – against Tata Sky Limited, decided on 24.03.2011. Member (R) gave a dissenting opinion in this case and found DTH operators in violation of Section 3 and 4 of the Act

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interoperability comes within the scope of anti-competitive practices or not. CCI answered in the negative. The CCI felt that the issues do not fall under anticompetitive practices as defined under the Competition Act, 2002, particularly provisions relating to cartelisation and tied selling, which the director general had presented as the basis for action after the preliminary investigations.

Criticism:

- DTH operators get set top boxes made to their own specifications, which are not usable on a competitor’s service. Interoperability is lacking, thus tying down a consumer to one provider creating disincentives to shift to another provider and affecting consumer choice.

- It affects innovation as such dominant practices dampen the desire to innovate by offering better quality and lower prices to be ahead of rivals.

- In network industries, it is often observed that some information technology (IT) products can operate more effectively when using other IT products. A lot of savings for the industries are made and enjoyed if the service providers using identical technology could share their infrastructure. This would allow for the competing players to pool resources and devote surpluses towards more innovation and improved service delivery rather than duplicating infrastructure.

- In addition, consumers would also be protected from the hassles associated with moving between operators, as they can gain access to a different player using the same equipment they have already acquired, as is happening in the case of mobile number portability.

- Interoperability therefore implies that consumer choice flourishes while competition also enhances.

- Interoperability in the DTH market would also imply that manufacturers of the set-top boxes, which are critical in receiving transmissions, would be able to manufacture universal products without a specific company in mind, thereby opening up the market to other potential entries, a situation which is difficult at the moment as manufacturers are tied to a specific DTH service provider.
Analysis:

Although there was no evidence of cartelisation and tie-ins, the fact that competition is being restrained by the practice remains crystal clear for all to see. Alas, the case was dismissed largely on a technicality than on substance. This situation still calls for attention as the consuming public is still disadvantaged, which requires the effort of both the sector regulator and CCI. In addition, the fact that the firms have decided to duplicate infrastructure rather than using common facilities to bring CAM cards implies that a sub-optimal economic situation hampering innovation continues to prevail in the market.

The regulations issued by the Telecom Regulatory Authority of India (TRAI)\(^{86}\) were largely meant to include the broadcasting and cable services also within the scope of telecommunication services.\(^{87}\) TRAI is thus mandated to ensure technical compatibility and effective interconnection between different service providers.\(^{88}\) This burning issue from the consumers’ point of view can thus be resolved with collaborative efforts between CCI and TRAI. Coordination between CCI and the sector regulators is a must.\(^{89}\)

However, cases involving interoperability have also proved difficult to handle in other competition jurisdictions. In 2004, the French Competition Council considered a case against Apple on the interoperability issue, which Apple won. The competition body was trying to force Apple to open up its Fair Play Digital Rights Management system to competitors. The case had been necessitated by the need to promote competition in the market by ensuring that Apple’s rivals also get access to the service.\(^{90}\)

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\(^{86}\) THE REGISTER OF INTERCONNECT AGREEMENTS (FIRST AMENDMENT) REGULATIONS 2004

\(^{87}\) Under the regulations, TRAI can also chip in to assist in resolving the anomaly, as ‘interconnection’ was revised to also allow for commercial and technical arrangements for service providers to connect their equipment, networks and services to enable their customers to have access to the services and networks of other service providers.

\(^{88}\) Section 11 of its enabling Act

\(^{89}\) While deciding in the NSE case Sebi should also have been involved in the competition case handled by CCI.

The CCI ruling thus leaves a gap that is still clamouring for attention as it is both economically and socially optimal for interoperability to be introduced in the DTH and similar markets.91

Chapter 7: ASSESSING INTEROPERABILITY IN THE TECHNOLOGY MARKET

Interoperability is not an end in itself. Consumers and the economy benefits from interoperability because it is, much of the time, an effective means to others ends. One such policy goal that has been at the core of the research initiative is innovation as interoperability in the technology market as interoperability fosters innovation. But interoperability also contributes to other socially desirable outcomes. In the three case studies, it has been observed that there is a positive impact on consumer choice, ease of use, access to content, and diversity, among other things. The following paragraphs provide a brief overview of the findings:

Advantages:

- **Innovation**: At a general level, two straightforward examples illustrate how interoperable systems in the ICT space can lead – and, in fact, have led – to massive amounts of innovation. The first one is the Internet as such, which can be seen as the ultimate interoperable design to which more and more non-interoperable networks and systems have converged. The second example is e-mail, the killer application of the early Internet. Neither e-mail protocols nor the concept of e-mail were restricted to a limited set of players, and their designs were broadly interoperable. Increased interoperability is likely to foster innovation by reducing lock-in effects and lowering entry barriers.

- **Competitive marketplace**: It gives birth to a competitive marketplace especially in the technology where consumers can choose and exchange information among the widest number of products. Open standards which can be implemented by all entrants in the marketplace allow for interoperability among a vast number of product offerings.

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Consumers are free to choose among competitive products and determine success or failure in the marketplace. Consumer choice flourishes with competition and drives innovation.

- **Improvement in Technology:** Market actors have taken a number of approaches to achieving technological interoperability in the ICT space. The most straightforward one is unilateral openness. These approaches to technical interoperability have the advantage of time to market and the ability to make improvements in technology systems without a great deal of coordination among many firms.

- **Network Effects:** Interoperability gives rise to network effects. Strong network effects also characterize the Web services market. Companies like Apple, Microsoft, or Facebook, to name just three, face the challenge of developing and adjusting their respective competitive strategies over time in order to profit from network externalities.

- **Autonomy, Flexibility, and Choice:** In interoperable ecosystems, users are more likely to choose among competitive and efficient options with regard to systems, applications, components, etc. that may be tested, mixed, and matched for specific purposes. For instance, an interoperable DRM music system would allow users to purchase music from their preferred online store and play it on any portable device they might own.

- **Access, Diversity, and Openness:** Increased levels of interoperability are likely to reduce access barriers to digital content in the technology market. It is a crucial building block in the technology market of an open ecosystem that, if properly developed and maintained, is believed to foster innovation and growth.

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92 For instance, a Web services provider like Facebook or Google voluntarily creates an open API that allows many others to interoperate with their services without the need for further approval or cooperation. The opposite approach is reverse engineering, as when Real Networks through their Harmony technology attempted to make its DRM scheme compatible with the iPod over Apple’s vigorous objections.


Flip side of the coin:
There are no disadvantages *per se* in encouraging interoperability, but for every good a technology can bring, there is always potential for its abuse. Following are some of the offshoots of interoperability:

- **Security:** A system that has more points of open access to data, in the simplest formulation, might lead to the ability of more people to access these data or to inject bad code. This security concern is not precisely a problem with interoperability, nor is it insurmountable. The fact that the systems can interoperate does not *per se* mean that more people have access to underlying data in a given system. It is theoretically possible that increased interoperability as between systems could lead to further vulnerability of the different components or systems if sound security measures are not taken.

- **Privacy:** The possibility, in certain situations, that interoperability might reduce individual privacy is among the most commonly voiced concerns about interoperability. It is true, on a simplistic level, that increased levels of interoperability may increase the number of players who could plausibly have access to personal information exchanged via an interoperable system. Each of our case studies suggests that it is possible.\(^95\)

- **Business Policy:** Achieving interoperability by regulators adversely affects business models that are built upon the lock-in of customers.\(^96\) While especially incumbent players may therefore perceive interoperability categorically as a bad thing or may be obliged to change their business model. Some view lower levels of interoperability lead to leapfrog innovation.\(^97\)

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\(^95\) In the DRM context, it has been argued that an interoperable standard may allow anyone who knows (or is able to discover) the standard to collect sensible usage data across platforms and applications. In both cases, the higher risk of technical failure is a consequence of the before-mentioned increased complexity of an interoperable framework. Against that backdrop, it becomes clear that it is not precisely interoperability *per se* that gives rise to increased privacy risks, but rather the specificities of its implementation.

\(^96\) In this context, it has been argued with regard to DRM that a forced opening of Apple’s FairPlay ecosystem to other parties would eliminate a fundamental characteristic of its business model and deprive the company of the expected rewards of previous investments.

\(^97\) Competition for the market sets incentives to come up with entirely new generations of technologies or ways of doing business (so-called “LEAPFROG COMPETITION”) in order to replace incumbent players and achieve temporary dominance. Apple’s strategy on the online music market might be seen as a case-in-point of this sort of competition for the market as a whole rather than for a share of it.
Chapter 8: RECOMMENDATIONS AND CONCLUSION

8.1 RECOMMENDATIONS

What can be done to promote competition through interoperability?

- Competition authorities should remain vigilant to ensure effective implementation of the interoperability at least in viable sectors as discussed in the paper as it enhances consumer welfare, boosts competition leading to economic development of the country.
- Consumers should demand software products which implement truly open standards for interoperability, such as the ISO Open Document Format (ODF).
- Governments and public administrations should avoid lock-in to the products and standards of monopoly suppliers by considering the wider use of Linux and other open standard compliant software products.

8.2 TAKE AWAYS FOR CCI

After a keen analysis on the concept of interoperability and the reflection on the three case studies (software interoperability, DRM and DTH interoperability) we can conclude that:

1. **Interoperability can be achieved by multiple means:** There is, in each instance, the possibility of intervention by the government or regulators or competition authorities to force interoperability at least in viable sectors like technology dealing with information exchange. Interoperability can be achieved by multiple means, for instance a single firm Facebook has allowed more than 5000 applications on its platform.

2. **Interoperability and Innovation:** Through the analysis it has been discovered that interoperability boosts innovation as when the products are interoperable, the market players strive to give better services by upgrading of technology and coming up with better products to retain their customers.

3. **Competition ‘IN” the market:** Interoperability is the most useful tool to create a level playing field which boosts competition in the market rather than only for the market. However, interoperability should not be pursued as a matter of public policy
in all cases but a case-by-case analysis must be done to determine whether and how to achieve an optimal level of interoperability. Software Interoperability is highly recommended.

4. **Determination of Relevant Market:** The determination of relevant market especially relevant product market can be done on the basis of the analysis given in the preceding chapter on relevant market.

5. **Approach To Be Adopted By CCI:** The approach in determining the importance of interoperability must be guided by the following goals:

   - **Effectiveness:** Understanding interoperability as a means and not an end in itself, the evaluation of an approach’s effectiveness would also consider to what degree the respective strategy tends to enhance competition in the market, foster innovation, or contribute to other policy goals such as consumer autonomy and choice. To be effective, a solution must also provide interoperability over time, not just in the first instance.
   
   - **Efficiency:** In several instances, most prominently in the technology market, we have seen that achieving and maintaining a certain level of interoperability comes with costs as argued in the DTH case. The efficiency criterion seeks to measure the level of costs imposed on an affected player – companies, but also users and governments, among other stakeholders – for a given degree of interoperability and compare it with other means to achieve interoperability that are available.
   
   - **Flexibility:** The ICT environment is a quicksilver technological environment characterized by a rapid rate of change. In order to be successful, a given approach to interoperability needs to be able to take into account important factual circumstances that characterize the environment in which it operates. Looking forward, it is particularly important that the approach is responsive to technological development to avoid technological lock-in.

Depending on the context of application, the three benchmarks might have different relevance or weight. One might imagine scenarios, for example, where interoperability serves such an important goal (consider, e.g., ATM compatibility) that flexibility – at least in the short run – is considered to be less important than a high degree of effectiveness in the immediate term. In other instances like DRM, one might be badly advised to impose
governmental standards given their relatively high costs and poor flexibility, despite the approach’s potential effectiveness.

Approach to be adopted for Private Players (BY CCI)

1. UNILATERAL DESIGN AND IP LICENCING: Unilateral design occurs when a market participant designs its products or services in a way that allows other players to offer interoperable products or services. In practice, IP licensing is particularly important, where interoperability is achieved by granting the contracting party access to technology, its specifications, and rights associated with its use.⁹⁸

2. TECHNOLOGICAL COLLABORATION: Technical collaboration usually involves some form of IP licensing, but is often characterized by a degree of co-operation that goes beyond the mere granting of IP licenses. Often, technical collaboration is an approach to interoperability used by companies at different levels of the value chain that try to improve the user’s experience of their respective customers by enlarging their usage possibilities.⁹⁹

3. OPEN STANDARDS: Open standards have a great potential for achieving high degrees of ICT interoperability.

Regulation Based Approach (BY GOVERNMENT)

1. MANDATING STANDARDS: Governments may decide to mandate the adoption of an interoperable standard on the part of industry players and choose among different forms along a spectrum: On the one end, the government might unilaterally determine the standard, on the other end, the government might merely set a timetable for industry players and require them to establish and implement a common standard.

2. COMPULSORY LICENSING: Another regulatory approach towards interoperability consists of the government mandating the disclosure of information that is essential to build interoperable systems, components, and applications.¹⁰⁰

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⁹⁸ In the DRM context, to take another example, Microsoft’s Plays for sure initiative was shaped by its making the Windows Media DRM available to different online stores and device manufacturers

⁹⁹ For example, in the area of DRM, Microsoft and Nokia established a bridge between Microsoft’s Windows Media DRM and the OMA DRM for wireless devices in 2005 that allows users to play certain DRM-protected music on their phones, PCs, and other devices supporting the Windows Media DRM-system

¹⁰⁰ Licensing on Fair, Reasonable and Non-Discriminatory (FRAND) terms
8.3 CONCLUSION

Indubitably, interoperability generally supports innovation in the technology market, but the relationship between the two is highly complex and fact-specific. Therefore, the best path to interoperability depends greatly upon the context and which subsidiary goals matter most, such as prompting further innovation, providing consumer choice, ease of use, or the spurring of competition in the field. In fact what is pertinent in this ever growing technological times is not only highlight the importance of having interoperability but at the same time the issue of sustaining interoperability as it is the key place to focus attention.

At the same time, the law arguably should recognise that interoperability and network effects, caused by the increased value of a particular product due to a larger number of users, alter the opportunities and threats for firms in the software industry, and that these opportunities and threats affect competition and innovation. Interoperability with other products can contribute significantly to the success of a computer program. Conversely, once a computer program has become successful due to network effects, preventing interoperability with other programs can exclude such competition, and therefore, serve to establish a lucrative, de-facto situation of exclusivity over a network or platform.

The state of play regarding interoperability in the case studies we have examined is not only the result of technological development and market forces, but is also shaped by the legal and regulatory system as is in the DTH case. Hence, interoperability should be promoted, where efficient to do so, not for its own sake, but because it tends to lead to other public benefits in the digital age.

Hence, interoperability must be promoted to encourage competition “IN” the market rather than “FOR” the market, whereby the ultimate benefactor is the consumer and the economy of the country.
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