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Review

Does Digital Rights Management Affect the Mobile Application Market?

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Summary

Distribution of digital content is a key aspect of electronic commerce. Digital content industry is threatened by rampant digital piracy. Institutional collective management is slow to adapt to rapid technological change in the digital environment. In the case of mobile software applications, smartphone and tablet operating systems with centralized application repository augment the ability of authors and rights holders to control the commercial exploitation of their works. However, digital rights management technologies used to prevent unauthorized reproduction, distribution and use of protected works can also create unwanted market effects limiting authors and users.

Key words: Digital Rights Management, DRM, competition, intellectual property, mobile applications, application marketplace

Introduction

Intellectual property rights, especially exclusive rights concerning economic exploitation of his work, stand against the widely accepted rules and regulations regarding competition and free market economic behaviour.[1] Even after fifty years of development of the common European market the tension between these two well-established legal disciplines is a much debated issue without definitive conclusions and universally accepted policies [Magnani, Montagnani,84].

In the decades past, there have been many legal and economic arguments concerning the character and scope of application of competition rules on the system of intellectual property in the common European market. In this paper, we will consider a current and important phenomenon – the question of the impact

[1] See References 2-5.

of digital rights management (DRM) technology and its legal position on the development of the mobile application market.

What is DRM?

DRM, or Digital Rights Management stands for technical measures, material (hardware) or immaterial (software) products whose purpose is to allow the legitimate user limited access to protected content in digital form. These technical measures (or technical protection measures, as defined by the articles 11 and 12 of the 1996. WIPO Copyright Treaty) are meant to stop an unauthorized user from copying and distributing protected content in digital form.

In theory there are many competing definitions as to what DRM actually consists of. A few follow for the sake of better understanding of this complex issue:

I) "*Digital rights management (DRM) is a type of server software developed to enable secure distribution – and perhaps more importantly, to disable illegal distribution – of paid content over the Web"* [Rump, 3].

While DRM technology can certainly be deployed via centralized server-client architecture, this is by no means its only *modus operandi*. DRM can be a standalone product or encryption software integrated with the protected content.

II) "*DRM covers the description, identification, trading, protecting, monitoring and tracking of all forms of usages over both tangible and intangible assets"*

This definition is perhaps too broad and does not focus on the main issue – that these technologies are rights management technologies – technologies dedicated to manage the use of protected content on behalf of the author, by the user. Furthermore, these technologies are digital in nature, and relate primarily to protected digital content [Rump, 4].

To conclude, DRM is an encompassing term for several different technologies used to enforce pre-defined limitations on how to access and use protected digital content. The technical protection measures we mentioned earlier are sometimes referred to as DRM technology, however some choose to differentiate between the two by defining technical protection measures as the technology used to control and restrict access as opposed to DRM as technology that relies on technology protection measures to implement these controls and restrictions.[2]

While this technical distinction may be important in identifying actual protection technology, speaking from a legal discourse DRM has historically been regulated as a technical measures and rights management information by the WIPO Internet treaties (articles 11 and 12 of the WIPO Copyright Treaty and articles 18 and 19 of the WIPO Performances and Phonographs Treaties) and the European InfoSoc Directive (article 6 of the Directive 2001/29/EC of the

[2] "Digital Rights Management and TPM", Office of the Privacy Commissioner of Canada, 2006., available at: http://www.priv.gc.ca/resource/fs-fi/02_05_d_32_e.asp

European Parliament and of the Council of 22 May 2001 on the harmonisation of certain aspects of copyright and related rights in the information society).
Defined in this manner, technical protection measures would consist of using various methods of product activation and access control, such as Internet product activation, using a registration key or a hardware device (*dongle*), as well as using various encryption methods to encrypt data on physical data storage devices and mediums as well as using digital watermarks to identify intended recipient or the document source.
Before we analyze the current framework and assess its impact on the development of the mobile application market, a couple of clarifications and assumptions need to be made.

DRM, intellectual property and competition

Current legal doctrine, to the best of our knowledge, broadly accepts the notion of influencing the application of intellectual property rights through competition principles. Increasingly, intellectual property rights are being curtailed by the application of competition principles [Korah, 432].
This notion is especially present in the *common law* legal doctrine, especially in the United Kingdom, United States [Korah, 433] and other *common law* legal systems, such as those of the former and current *Commonwealth* members. However, this idea is contested in the European continental legal systems, once again illustrating the divide between these two legal disciplines [Korah, 434].
DRM technology has, through broad international and national legislative efforts, as mentioned earlier, become a legally recognized and regulated means of managing the use and distribution of protected content in the digital domain.
Deploying mobile applications, in essence computer software developed by third parties for mobile phones, tablets and other portable computing devices, follows rather different rules then obtaining and licensing software for traditional desktops and laptops under well-established operating systems such as Microsoft Windows, Apple OS X or Linux. Mobile applications and mobile operating systems, most notably Apple iOS, Google Android, Windows Phone and quite a few other legacy (Symbian, BlackBerry) and upcoming operating systems (Mozilla Firefox OS, Ubuntu Mobile etc.) employ a fundamentally different model of application distribution then their desktop counterparts.
Where desktop users usually choose the method of application distribution, and intrinsically the application origin, the mobile users usually have only the option to download and install applications through the official market (such as Windows Market, Google Play or Apple App store).[3] These markets employ a DRM (Digital Rights Management) solution to regulate the way users can ac-

[3] Some mobile operating systems, such as Android or legacy Symbian, allow users to install applications originating from third party marketplaces or other sources.

cess, install and use protected software, make in-application payments to access additional functions and receive periodical upgrades and offers.

Using exclusively official market content (the only available option for Windows Mobile or Apple iOS users) usually means a higher level of quality control and application security, having only one official channel of distribution also means conformity with the less beneficial traits of the DRM protected application delivery system. Furthermore, the fact that an application has been approved to enter the market does not mean that it will remain accessible in the foreseeable future. Once approved, an application can be removed from market at any given time by the market service provider.[4] Revocation of already published applications and preventing certain applications or even types of applications to enter market is an issue of concern to parties other than developers and market service providers.[5]

Finally, the ability of market service providers to revoke a potentially harmful application is instrumental in securing distributed applications.[6] The growing mobile devices market has been experiencing a surge in the development of increasingly sophisticated malware applications on an almost a daily basis.[7]

The role of the DRM technology in the digital content market

Fundamentally, DRM technology serves as an access control tool to protected content. It manages the right to control access to protected content according to the rights of the user. It prevents the unauthorized user from accessing protected content and prevents illegal reproduction and distribution of the protected content. Historically, DRM technology has appeared both as a standalone technical protection measure as well as a part of a broader hardware and software platform (such as the Apple iTunes system).

Concerning the management of protected digital content in contemporary transnational information economy, content enterprises usually adopt one of the two

[4] Mobile application acceptance process for Apple's App Store is based on a profile certificate check approach, which is a standard practice that ensures the integrity of software applications. Reasons for revoking an application from the market can vary from violation of a license agreement to different security concerns due to lost encryption keys. Ability of market owners to revoke application is very important to ensure security of distributed applications.

[5] Removing a successful application from the App Store has attracted the attention of French government on at least one occasion. http://www.reuters.com/article/2013/04/11/apple-france-appstore-idUSL5N0CY42J20130411

[6] Even the purportedly secure iOS ecosystem has been found to harbour at least one malware application that slipped past the curators. http://www.wired.com/gadgetlab/2012/07/first-ios-malware-found/

[7] There are numerous reports regarding the mobile malware development in the security industry. One of the recent research papers analyzes the case of iOS malware corrupting an already inspected application via remote modification of code. See reference 12.

strategies. The content company either develops its own digital distribution channel where it licenses access to its content (like Amazon or Sony), or it adopts an existing distribution channel developed by another company out of specific content business (i.e. the case of music and film studios cooperating with Apple or Google).

It is important to note, however, although it does not in itself present the main topic of this paper, that DRM technology in and of itself presents a specific and important market. Not only do access control systems limit users in accessing and using the protected content in terms of interoperability, preventing the use of content licensed by one company through hardware and software of another, the technology itself presents a product [Magnani, Montagnani,84] and a market where rights holders have an intrinsic motive to adopt the most effective, affordable and secure technological protection measures. Preventing a competitor in obtaining the most effective DRM technology can also present a present a violation of free competition.

Since DRM is legally protected, and it's circumvention is prohibited by a widely accepted legal framework, it is an excellent example to study the effects of DRM technology on application market, and indirectly to assess the impact of legal protection of DRM on competition in this specific market.

Fairplay/iTunes as an example of DRM protected distribution system

As a content distribution system, iTunes allows users licensing and access to music (albums and individual songs), films, television series episodes, radio broadcasts, podcasts etc. Since digital distribution eliminates the need for material data storage disks, effectively provides free shipping and abolishes other costs associated with material products, the licensing fees for digital content are usually lower. Individual songs or broadcasts can often be licensed for less than one dollar or euro, and allow users to license only content they're interested in (not the whole album, season of television series etc.).

This licensing flexibility, combined with lower cost, has arguably been the main reason behind the massive success of iTunes allowing it to become the most popular digital distribution system in history.[8]

Massive success of iTunes has also attracted the attention of national competition authorities.[9] Some have concluded that Apple's use of DRM in creating a

[8] Since April 2004., iTunes has grown from initial 200,000 digital content files to over 20 million individual digital content files including music, podcasts, films, music videos, audio books and over half a million computer programs for Apple OS X and iOS computer and mobile device operating systems. In the same time period the number of individually registered users has reached almost 600 million users, almost 25% of all Internet users in 2013., according to Internetworldstats.com and CNN, available at: http://tech.fortune.cnn.com/2013/06/15/apple-algebra-itunes-asymco/

successful online distribution scheme did not represent a market violation, others disagree. While we do not agree with the opinion of the French competition authority, its analysis of the Apple's practices yields interesting conclusions important for the development of the mobile application market.

As we have mentioned earlier, digital distribution of content eliminates the need for material data carriers, packaging and physical distribution reducing the costs of distribution to a modest fraction of the original cost. Rights holders have eagerly accepted iTunes as a new distribution channel, especially in the face of rampant digital piracy and declining sales of CDs, DVDs and other material media. While Apple has since all but abandoned its proprietary "Fair Play" DRM system, its introduction in 2003 has secured early support of the many of the world's largest rights holder companies and media corporations.

The terms and conditions in the iTunes user's licence agreement have set the standards for the most DRM protected services. Among the most dangerous, from the aspect of consumer protection, is the provision allowing the service provider to limit or deny access to licenced content in the event of closing the iTunes service [Roth, 524]. Furthermore, the user is limited in copying licensed content and authorizing additional devices to access licensed content [Roth, 524]. These terms are still valid for the remainder of the iTunes catalogue, and may relate to licensing of mobile applications from the App Store as well.

How does Apple's behaviour, and indeed the whole iTunes/AppStore/iOS ecosystem affect competition? In order to answer that question the first condition is the need to recognize the relevant market.

Since iOS is Apple's proprietary operating system exclusive to Apple's devices, it is obvious that accepting the use of iOS basically means using Apple's devices as well. If that is the case, why should using the AppStore as an exclusive source for purchase of additional software present a market violation? Is not Apple well within its right, as a competitor in an immensely competitive market (mobile reproduction devices, smartphones and tablets), to choose a business model that binds the hardware (devices) and software (iTunes, iOS, App Store) into a whole eco-system as a best chance of market success? The users can choose from a variety of competitors offering similar devices and services, and, as the French authority asserted in *Virgin Mega* case, Apple's market share concerning multimedia playback devices (iPod) cannot even be considered a dominant position?

The answer is the market creating effect of DRM. Not only does DRM prevent unauthorized access, reproduction and distribution, it also has a market creating effect by preventing users from accessing and using licensed content in a manner of their own choosing. Never before has licensing of content, music, movies

[9] The above mentioned *Virgin Mega v. Apple* case and the opinion of the Norvegian consumer rights ombudsman available at: http://forbrukerportalen.no/filearchive/Complaint%20against%20iTunes%20Music%20Store.pdf

or computer software implied a limitation on the actual type of device being used to access content. By limiting the users to their own hardware ecosystem, Apple has, effectively, created a new market. This is obvious in the case of mobile applications where choosing Apple devices and their iOS system means accepting AppStore as the only legitimate source of new applications. It is less obvious in the case of licensing music or video content, nevertheless Apple's implementation of DRM and its restrictions preventing users from using licensed content on other devices meant a fragmentation of the existing market and the creation of a new niche market – the market of content for Apple devices.

This development in practice meant that unlike most of the competition in the traditional digital content market Apple managed to control the devices and download services monopolizing the market of Apple devices in terms of content distribution. Effectively, Apple has succeeded in using intellectual property protection (copyright on software, as well as patents on hardware and software) as a means to monopolize access to its devices. While it is understandable that competition regulators cannot foresee the future market development, the disparity between the decisions of the European regulators in the cases of Microsoft and Apple illustrates how information technologies can have unexpected economic legal consequences. In hindsight, Microsoft's quasi-monopoly in the desktop and server operating system market has shown to be much less dangerous and competition, coming both from Apple and Google as well as from the Free Software/Open Source community has successfully developed competing products and business models. On the other hand, the company whose devices were just one of the many present in the mobile media player market which in itself at the time of the consideration was a minor market in the broader media appliance market turned out to represent a much more serious challenge to maintaining competition in several emerging markets (mobile phones and applications, digital publishing and media).[10]

To conclude, it can be argued that Apple's behaviour and usage of DRM technology resembles the effects of a tie-in agreement – from the competition perspective, a well-understood practice of selling a product or a service as a mandatory addition to a purchase of another product or service.

The competition practice in the EU (Microsoft Corp v. Commission of the European Communities, 2004) as well as the United States (Jefferson Parish Hospital vs. Hyde, 466 US S2 (1984) has identified five conditions needed to judge a tie-in agreement a market violation. The five-step tie-in test [Schmidt, Hedwig, 183] may or may not still be viable in general terms and may be substituted in the future [Schmidt, Hedwig, 183], but until such time the current criteria consists of: existence of two, from the consumer's perspective unrelated prod-

[10] In 2012. Apple became the company with the highest market capitalisation in the US, worth over 600 billion USD.

ucts, the dominant position of the market player forcing the tied purchase, preventing consumers from purchasing products separately, endangering the competition and absence of legitimate, objective reasons for a tie-in agreement.
From user perspective, Apple's ecosystem and the restrictions regarding the types and functionalities of applications allowed on its smartphones has from the start been received with attempts to circumvent or disable technical protection. This procedure, colloquially known as "*jail-breaking*" has been itself an object of official inquiry and judicial procedure, at least in the United States.[11]

The mobile bazaar

In the seminal 1996 essay "The Cathedral and the Bazaar", a decade before the appearance of earliest modern online mobile application stores, the veteran open source evangelist E. S. Raymond described the rise of two distinct models of application distribution, one governed by a single hierarchical entity (the cathedral) and one open to parallel input from different, competing or cooperating sources (the bazaar) [Raymond, 3].
Where Apple's model is obviously one of a cathedral, where the market service provider ultimately decides to accept or reject publishing software and where users have no legal recourse to challenge the market service provider's decisions, Google's Google Play model is, in line with open source heritage the company draws from, a practical exercise of the bazaar model.
Allowing users to choose between a curated Google Play market yet retaining the option to allow installation of applications originating from other, independent markets or directly from the World Wide Web or a data storage device, Google has adopted a model that fosters competition and openness. Even if an application does not qualify for distribution through Google Play market (be it for quality control reasons, security etc.) the user still has an option to install it through another independent market, directly from the manufacturer's website or by locating and installing it manually.
The phenomenal success of the Android mobile operating system, which accounts for more than three quarters of all smart mobile phones and more than a half of all tablet computers owes in no small part to the bazaar model adopted

[11] In 2010., the US Court of Appeals for the 5th Circuit, No.08-10521 MGE UPS Systems INC v. GE Consumer and Industrial Inc etc. decided that "*The owner's technological measure must protect the copyrighted material against an infringement of a right that the Copyright Act protects, not from mere use or viewing*", effectively establishing *jail-breaking*, at least in the case of the iPhone, a fair use. In addition, in a previous statement by the federal Copyright Office with regard to Apple's claim of copyright protection over the encryption software in the iPhone's bootloader the Copyright Office concluded: "*While a copyright owner might try to restrict the programs that can be run on a particular operating system, copyright law is not the vehicle for imposition of such restrictions.*" In other words, copyright and even legal protection of technical protection measures cannot be used to limit the users with regard to the way they use their devices.

by Google, and by example followed by the major manufacturers of Android mobile phones.[12]

Conclusion

Considering the success of mobile application eco-systems developed around the App Store/Marketplace model and the central role of DRM technology in all but one of the competing systems it is safe to conclude that DRM technology can exhibit a strong anti-competition effect.

It is obvious that open systems allow more user freedom and foster competition. While absence of a closed curating system may present security risks and overall lower levels of quality control, market forces ensure that users can choose quality and advanced technical capabilities unavailable in the closed markets due to technical limitations imposed by the proprietary systems or prohibitive policies of the market service provider enforced by its DRM.

However, this is not the case against adopting and further refining DRM technology. The technology itself is neutral and can be put to constructive use as well. Effective DRM technology can enable individual authors – artists, journalists, programmers – to develop and monetize their work online without the need for intermediaries like publishing houses or collective rights management societies. Even the closed off application markets of today with their anti-market DRM implementation are often a more affordable and effective choice for today's authors. DRM and developing content management systems hold the promise to finally turn the tide of rights management from collective to individual – for the first time since the invention of the printing press.

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[12] Exact number is 79.3% of the global market share in the second quarter of 2013. Source: IDC Worldwide Mobile Phone Tracker, August 7, 2013

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