

DIGITAL RIGHTS MANAGEMENT

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Abstract

Digitalization of content is both a blessing and a curse. While it allows for efficient transmission and consumption, the ease of copying and sharing digital content has resulted in piracy. Digital Rights Management (DRM) has emerged as a multidisciplinary measure to protect the copyright of content owners and to facilitate the consumption of digital content. The basic goal of the digital right management (DRM) is to develop and control the access of ‘‘intellectual property’’. There are various pros and cons about DRM. This paper focuses on definition, requirements, aspects of DRM for digital content and user issues.

Keywords

DRM, Open Access, Intellectual Property Rights, IPR

Introduction

Nowadays, technology has opened new gates for a highly efficient mode of knowledge and information. This technological advancement has made this era a digital era. With the help of Digital media we can store information easily on computers as “data”, understand information complexity, regularize the information access and improves information environment. The Internet has emerged as a vibrant information and digital entertainment hub. However, it has some drawbacks. The ease of copying and sharing of digital content such as music, without any deterioration in quality, has resulted in uncontrolled piracy. Consequently, the content owners stepped in to tap on the unlimited potential of the Internet as well as to curb this piracy with technological and legal measures. One of such measures is Digital Rights Management (DRM).

Research Methodology

Objectives

- To get the knowledge about Digital Rights Management(DRM).
- To create awareness about DRM

Scope and Limitations

The scope of this study is to examine the theoretical aspects of the Digital Rights Management in Indian perspective, as the study is purely based on the secondary data.

Method of Writing

The author has attempted to adopt an analytical and exploratory approach. The method adopted is analytical in so far as it seeks to understand the meaning and basic functioning of Digital Rights Management.

Sources of Data

The present study is of descriptive nature based on secondary data collected mainly through various authentic websites, published research papers, journals, books and various reports of research studies.

Definitions:

Some definitions of DRM are as follows:

- 1) DRM (Digital Rights Management): Any technology used to limit the use of software, music, movies or other digital data. This generally relies on some interaction between the media and the system that plays it.
- 2) DRM refers to controlling and managing rights to digital intellectual property.
- 3) DRM is the description, identification, trading, protection, monitoring and tracking of all forms of rights usages over both tangible and intangible assets including management of rights holder's relationships.
- 4) DRM must be about the "digital management of rights" not the "management of digital rights".

Digital rights management (DRM):

It is a class of access control technologies that are used by hardware manufacturers, publishers, copyright holders and individuals with the intent to limit the use of digital content and devices after sale. DRM is any technology that inhibits uses of digital content that are not desired or intended by the content provider. The basic goal of the digital right management (DRM) is to develop and control the access of 'intellectual property'.

History of DRM:

IPR (Intellectual Property Right):

Intellectual property is the creation of the human mind. A human being's potential efforts to intellectual outcomes have considerable value in economy. Rights associated with the intellectual property which gives legal protection is referred to as intellectual property rights.

Pros and Cons of DRM:

The use of digital rights management is controversial. Content providers claim that DRM is necessary to fight copyright infringement online and that it can help the copyright holder maintain artistic control or ensure continued revenue streams. Those opposed to DRM contend there is no evidence that DRM helps prevent copyright infringement, arguing instead that it serves only to inconvenience legitimate customers, and that DRM helps big business stifle innovation and competition. Further, works can become permanently inaccessible if the DRM scheme changes or if the service is discontinued. Proponents argue that digital locks should be considered necessary to prevent intellectual property from being copied freely, just as physical locks are needed to prevent personal property from being stolen. Digital locks placed in accordance with DRM policies can also restrict users from doing something perfectly legal, such as making backup copies of CDs or DVDs, lending materials out through a library, accessing works in the public domain, or using copyrighted materials for research and education under fair use laws.

DRM for digital content: DRM is basically an aggregation of security technologies to protect the interests of the content owners so that they may maintain constant ownership and control of their content. A DRM system essentially specifies, manages and enforces "rules" in all aspects of the digital content, in particularly in its usage and distribution.

Working of DRM:

A user could be made to pay in order to access the digital content as well as be restricted from making copies of it and sharing it. DRM is being employed today to protect digital content (encryption), control specific operations on the content (play, print, copy, save) and to limit the number of times a particular operation may be exercised on the content (e.g. view three times).

DRM technologies attempt to give control to the seller of digital content or devices after it has been given to a consumer. It prevents the consumer access, denying the user the ability to copy the content or converting it to other formats. Usage permissions must be obtained to gain access to a DRM controlled digital file. These permissions are sometimes referred to as a key, permit or license and may be obtained prior to receiving acquisitions (library materials). Since digital content can be perfectly replicated and distributed infinitely, publishers and other content originators are employing DRM and persistent protection to prevent the abuse of their intellectual property.

Various aspects of DRM

DRM is multidisciplinary and does not just depend on technology. There are other aspects to this content protection framework namely legal, social and economic.

Legal: No DRM technology is going to be of much help if the law does not provide provisions to enforce the rights of the content owners. DRM has to be able to effectively apply and resolve local and international laws to protect these rights particularly when different countries may have very different copyright laws.

Social: DRM needs to address a host of social issues such as privacy and fair use. Some users prefer anonymity on their consumption of the digital content while others would not want any profiling to be done on them. There were many discussions on the notion of fair use (for example, is it fair to make a backup copy?). Together with public education, DRM has to be able to present some value to users so that they would make use of DRM and respect the copyrights of digital content.

Economic: DRM requires certain economic questions to be answered that who would pay for the DRM structure, i.e. the users or the content owners?

Fair_use:

The legal scholars, politicians and copyright owners agree that fair use is hard to understand and it fails to provide effective guidance for the use of other works today. Library and information centers have right of fair use under copyright laws (legalized by many governments). Certain illustrations have been included to ascertain potential fair users under copyright law. Four factors must be taken into account in analyzing whether the use is fair or not in copyright law.

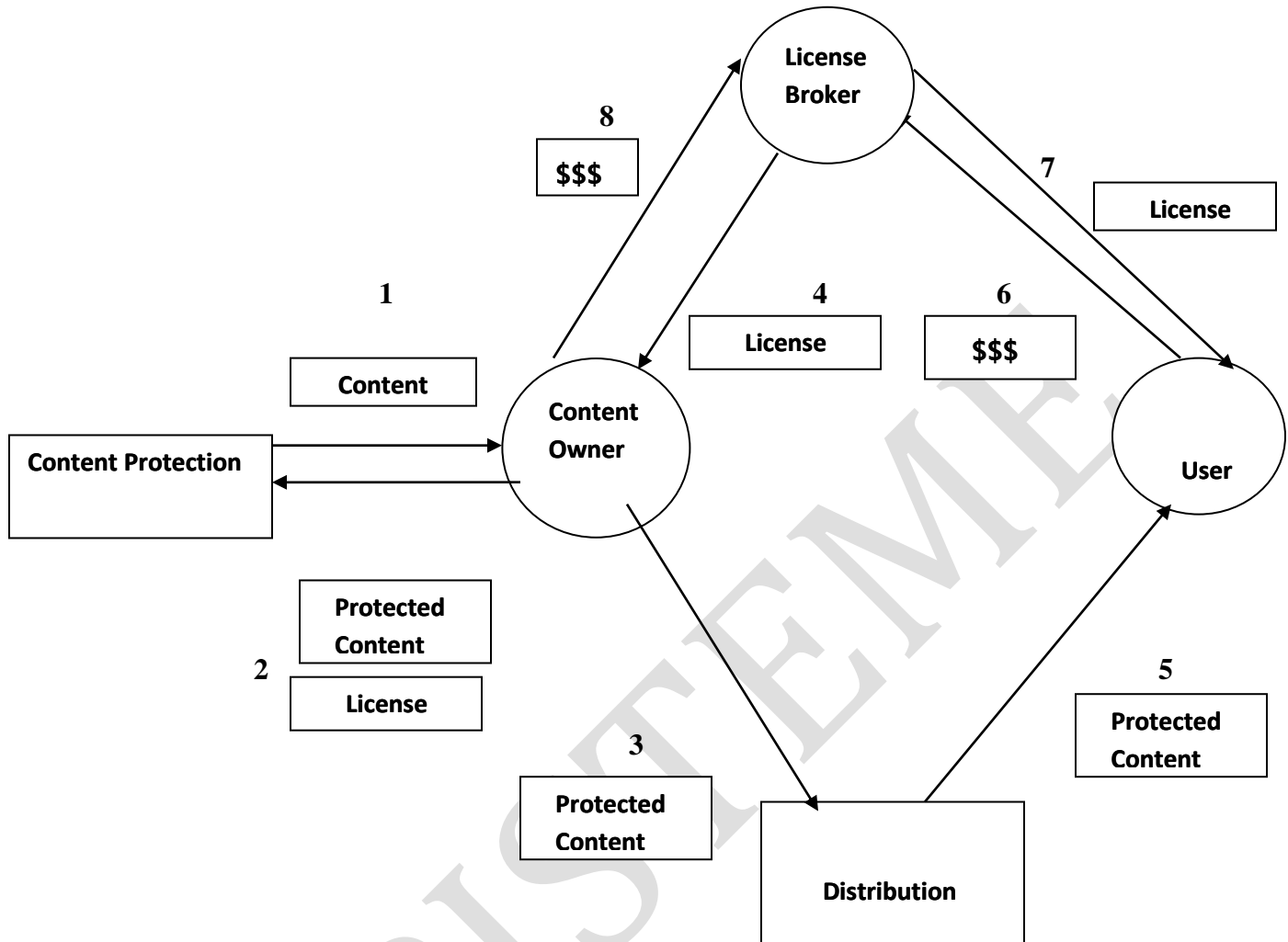
The four factors for analyzing fair use include:

- 1) Character of use
- 2) Amount and importance of the part copied
- 3) Nature of the material to be copied
- 4) Effect on market for permission

Overview of DRM system

Here, we present an overview of a typical DRM system. There are essentially three parties in the setup illustrated in Figure 1, namely the *Content Owner*, the *License Broker* and the *User*. The Content Owner usually owns all rights to the content. The License Broker handles all transactions, on behalf of the Content Owner, pertaining to the issue of a License that would specify exactly the permissions granted to a user on the use of the content, subject to certain terms and conditions. It is trusted in the sense that it would not allow the user unauthorized access to the content. It would also enforce the terms and conditions of the usage of the content.

We outline the process of this DRM system:



1. The Content Owner would input the Content to the DRM system for Content Protection. Here, the Content Owner may want to insert a digital watermark into the Content for purpose of identification. The DRM system would then encrypt (in most instances, using proprietary encryption techniques) and it is packaged for distribution. The Content Owner would need to specify, using a Rights Expression Language (REL), all applicable usage rights or rules that apply to this content. It may be necessary for the Content Owner to specify multiple sets of rules for different contexts.
2. The DRM system would return a Protected Content and a License (or one set of Licenses). The License contains all the applicable rights, terms and conditions on the

usage of the content. The License must be used as a whole to access the content. Here, the Protected Content is ready for distribution.

3. The Content Owner disseminates the Protected Content through various distribution channels including but not limited to the Internet, physical mediums such as CD-ROM/DVD, Email, Instant Messaging and P2P file-sharing. Distribution through the latter three media forms refers to the concept that users may freely redistribute the Protected Content without any restrictions. The idea is that users tend to forward their peers content that they like themselves, leading to efficient and effective distribution of content. This redistribution is made permissible since new users would still need to request for a License in order to access the content.
4. The Content Owner sends the License(s) to the License Broker. The License Broker is a trusted clearinghouse who would handles all transactions requesting for access to the content. Thus, the License Broker frees up some resources and allows the Content Owner to concentrate on content development. The License Broker can also give feedback on users' consumption profile.
5. The User retrieves the Protected Content from a distribution channel. It examines its meta-data to identify the required License in order to access the content and the (location of) License Broker(s) that could provide the License.
6. If the user (consumer) does not have the required (or a valid) License, the User would contact a License Broker to request for a License and making the requisite payment.
7. After the user has made payment, the License Broker would issue a License to the User. Depending on what the user (consumer) has paid for, the License Broker would allow the user to access the content in a controlled manner.
8. The License Broker would remit to the Content Owner the proceeds from the transaction (after deducting its service fee). It may also provide some useful information from this transaction.

DRM under Attack: Weakness in Existing Systems

Inevitably, there would be attempts to crack DRM systems either to obtain the digital content or for prestige (for hackers).

Attack on eBooks

Adobe PDF and Microsoft Reader are the most common and widely used formats for eBooks. eBooks in Adobe PDF formats are typically password-protected. In particular, password recovery software such as Advanced PDF Password Recovery from Elcomsoft can find passwords for eBooks of PDF version 1.3 (which uses a 40-bit key) in a few days. This software can additionally remove safeguard mechanisms which prevent printing and copying of the PDF eBook. E-Books of the new PDF version 1.4 uses 128-bit passwords and hence are better protected. Similarly, there are attacks on Microsoft eBook Reader. In particular, a software ConvertLIT can convert a Microsoft eBook into another (public-domain and widely used) format for copying and sharing purpose.

Conclusion

This paper presented a comprehensive survey of the DRM Technology.

Digital right management is essential for human creativity. Under this system of rights, creators are assured that their works cannot be copied anywhere. Digitizing and using copyright work in IT environment require this technology. DRM should focus for growth, economic progress of individuals and institutions and contribute in the increment of knowledge, culture and information exchange all over the world.

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Bio

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