DRM : Technological Measure for Digital Contents on the Silicon Plaform

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Abstract

Electronic Information is the logical extension of the development in technology and the positive response to the growing need of the users for easy access of information and rights holders can gain better access to large amounts of rights data, and today most use that electronic tool. In order to manage the electronic information some effective tools like, Electronic Information Management (EIM), must be incorporated. In the simplest definition, EIM means using office technology systematically to help you store, retrieve, and safeguard your organization's information. Most people think immediately of reducing paper, but as we rely more and more on technology to create digital information - software files, digital photographs, and Email, EIM takes on a broader scope. With current technology it's possible to manage a complete "library" of information with centralized security, backups and control, different levels of retrieval and access, and archival storage. Digital Right Management offers a better way to manage the records you rely on. Whether documents are stored in an original electronic file format or scanned from paper, managing their storage, access and retention becomes easier with technology.

Keywords : Digital Right Management, E-Information, Technology, Access Modes, Networking.

0.   Introduction

Information is vital resource, which is growing exponentially, speeding and spreading like a tidal wave – inevitable and unstoppable. It touches all human activity and is communicated in a multitude of ways. Access to information is generally recognized as contributing significantly to the efficiency of any organization. Continuous user's demand (the need to provide about 2 relevant information) are the biggest driving force for the organization of activities and changes in means of production of information goods and services. Recent developments in computer and telecommunication technology along with the innovation of Internet and he need to facilitate easy access of information seekers has given birth to electronic publishing. Today digital information is fuelling demand for islands of filtered information in the ocean of information now available.

1.   Digital Rights Management

One of the most common things said about DRM is that "there are many definitions". Such a statement is both a symptom of the complexity of the issue and a major impediment in encouraging serious attention. The simple definition of DRM actually is. :

"Technology that describes identifies and protects digital content". To this could be added, "Protected by intellectual property rights and in accordance with rules set by rights holders or prescribed by law".

1.1   The three essential elements can then be deconstructed as:

- Description - knowing what the content is and how it can be used;
- Identification - of how, and by whom it can be used;
- Protection - encryption or other measures to ensure legitimate usage.

Digital Rights Management (DRM) systems restrict the use of digital files in order to protect the interests of copyright holders. DRM technologies can control file access (number of views, length of views), altering, sharing, copying, printing, and saving. These technologies may be contained within the operating system, program software, or in the actual hardware of a device.

DRM systems take two approaches to securing content. The first is "containment," an approach where the content is encrypted in a shell so that it can only be accessed by authorized users. The second is "marking," the practice of placing a watermark, flag, or a XrML tag on content as a signal to a device that the media is copy protected. So both the approaches are vulnerable to cracking by individuals with "moderate" programming skills.

DRM technology and legislation requiring the inclusion of copy control systems pose serious threats to privacy, open source software development, and the fair use of copyrighted content. Some DRM technologies have been developed with little regard for privacy protection. The systems usually require the user to reveal his or her identity and rights to access protected content. Upon authentication of identity and rights to the content, the user can access the content.

2   Important aspects of DRMS

- DRM systems can prevent the anonymous consumption of content. DRM systems could lead to a standard practice where content owners require all purchasers of media to identify themselves. In other areas where individuals can borrow or purchase media, such as video rental stores or libraries, statutory and ethical protections prevent the transfer of personal information linked to the content acquired. Such protections do not exist in the music and growing electronic book markets. In these unregulated areas, artists and authors may have more difficulty in finding an audience for their work because of the privacy risks associated with linking identity to content consumption.

- In addition to preventing anonymity in access to digital information, DRM can be used to facilitate profiling of users' preferences or to limit access to certain content. This is done by assigning an identifier to content or to the content player, and attaching personal information to the identifier. For instance, Microsoft's Windows Media Player has an embedded globally-unique identifier (GUID) to track users. Similarly, Microsoft's eBook Reader requires the user to "activate" the software and link it to a Passport account. From there, Microsoft captures a unique hardware identifier of the user's computer. There is also an activation limit that can stop a user from transferring an eBook to other computers. This enables Microsoft to prevent users from sharing books or from reading a book on a different machine.

- These technologies mark an important development in the use of copyright law: copyright can regulate duplication of works to protect content owners. Now, copyright is being used as a justification to both protect content and to profile the consumers of content.

- Linking personally-identifiable information to content may result in "price discrimination." Price discrimination is the practice of selling an item at different costs to different consumers. It can be facilitated where the seller knows the consumer's identity, and can associate the identity with a profile that includes financial information on the consumer. DRM systems may enable content owners to control access to content, but also to adjust the price of content based on the consumer's identity.

- Alternatives exist that would provide copy protection and at the same time protect privacy. For instance, token and password systems could be used to authorize a download of digital content. Alternative, non-privacy invasive solutions have not been explored adequately.

- DRM systems that have been designed impinge on users' control and use of content. Many DRM systems will not allow a user to transfer content to portable devices, such as MP3 players. In addition, many DRM systems work only with Windows operating systems to the exclusion of Linux and Macintosh users.

- DRM systems may also be designed to actually harm a user's system. One product in particular, In Tether Point-to-Point, can impose "penalties" for "illegal" uses of files. The program can force a reboot of the user's computer or destroy the file that the user was attempting to access. DRM may also be referred to as "Content Management Systems" (CMS), "Content/Copy Protection for Removable Media" (CPRM) or sometimes as "technological measures."

3. Role of Technologies in Managing the Digital Information Assets

The information technology infrastructure should provide a seamless "pipeline" for the flow of explicit knowledge through the 5 stages of the refining process to enable

- Capturing the electronic knowledge,
- Defining, storing, categorizing, indexing and linking digital objects corresponding to knowledge units,
- Searching for ("pulling") and subscribing to ("pushing") relevant content,
- Presenting content with sufficient flexibility to render it meaningful and applicable across multiple contexts of use.

Information technologies such as the World Wide Web and Lotus Notes offer a potentially useful environment within which to build a multimedia repository for rich, explicit knowledge. Input is captured by forms for assigning various labels, categories, and indices to each unit of knowledge. The structure is flexible enough to create knowledge units, indexed and linked using categories that reflect the structure of the contextual knowledge and the content of factual knowledge of the organization, displayed as flexible subsets via dynamically customizable views.

Effective use of information technology to communicate knowledge requires an organization to share an interpretive context. The more that communicators share similar knowledge, background and experience, the more effectively knowledge can be communicated via electronically mediated channels. At one extreme, the dissemination of explicit, factual knowledge within a stable community having a high degree of shared contextual knowledge can be accomplished through access to a central electronic repository. However, when interpretive context is moderately shared, or the knowledge exchanged is less explicit, or the community is loosely affiliated, then more interactive modes such as electronic mail or discussion databases are appropriate. When context is not well shared and knowledge is primarily tacit, communication and narrated experience is best supported with the richest and most interactive modes such as video conferencing or face-to-face conversation.

4. Digital Information Resources : Sources and Access Modes

The main kinds of electronic information sources are:

- E-Book
- E-Journals
- E-Zine
- Electronic Thesis & Dissertations (ETD)
- E-reference Tools
- Electronic Newspaper

5.   Access to Resources

i)   Remote Access: In this type of access vendor/publisher hosts their journals at their website. When the Library or individual subscribes to the e-journals, it is provided right of access.

ii) On-site Access: Publishers deliver thee-journals to subscribers through CD-ROM or through their website or FTP option.

iii) Access through Database: Here seamless access to information is achieved through the link model offered by database producers and vendors.

6.   Electronic Information and Future of Library Resource Networking

The rapid expansion in the volume and disciplinary scope of electronic information will have a dramatic impact on the future development of interlibrary networking. The traditional reliance on union databases of holdings integrated with interlibrary loan requesting systems and on the physical or fax transfer of books and photocopied articles will begin to shift dramatically as more libraries secure access to digital full-text.

Libraries of all types and in all settings are developing a global vision of international networked collections and services. This model views libraries as both providers of worldwide information resources and gateways for users to knowledge, which is increasingly digital in form. This transformation requires recognition of important revolutionary changes, which are transforming collections, information services and the working relationships among libraries.

7.   Conclusion

The most common aspect of digital information is "copyright" management means, to decide who has right to access the information?. Digital Rights Management technologies are the means for content owners to control the use of their content. DRM technologies can be used for more nefarious purposes such as infringing on privacy, personal profiling, price discrimination based on personally identifiable information and stymieing the development of open source software. For libraries, DRM technologies can additionally impact first-sale, preservation activities, and institute pay-per-use pricing.

8.   References

1. Butler, D.; The Writing is on the Web for Science Journals In Print; Nature; 397 (6716) pp.195-200; 1999.

2. Chand P.; Mahesh G. & Lakshmi V.V.; Access to Electronic Journals; Archiving Issues; In Library and Information Networking-NACLIN 2002 held at Cochin University of Science & Technology; Cochin; 21-24 Oct.; 2002; DELNET; New Delhi; pp.329-336.

3. Saha B; Electronic Publishing; Present Scenario; Problems & Prospects In "Digital Information Systems & Services"; XX National Seminar of IASLIC 2002 held at Punjabi University; Patiala; 27-30 December 2002; pp.177-182.

4. SIngh Y.K.; Vajpai R.V. and Kumar R.; E-journals; A challenge for University's Library Situated In Remote Area In 21st Annual Convention & Conference; Society for Information Science (SIS-2003); 9-11 April 2003; held at Central Library; Indian Institute of Technology; Roorkee; pp.226-231.

5. Singh C.N. and Singh N.; E-Resources versus Traditional Resources; A British Council Perspective In 21st Annual Convention & Conference; Society for Information Science held at Central Library; Indian Institute of Technology; Roorkee; 9-11 April 2003; pp.223-225.

6. http;//library.brandies.edu/beijimgconference/jamesneal; 06/09.2003.

7. http;//www.stm.assoc.org/annualreport ; 09/09/2003.

8. http://www.epic.org/privacy/drm/Index ; 10/09/2003.

9. Jha K.N.; Mishra V. & SInha B.N.; Internet; Emerging Technology for Information Generation and its Services to Users; Annals of Lib. Sc. & Documentation; **46(2)**; pp.59-64; 1999.

10. E. Books; All set to Replace Paper Book An EFY Report; Electronics for you;**35(8)**; pp.30-34; 2003.

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