

ELECTRONIC BOOKS: A NEW GENRE OF CONTENT MANAGEMENT

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Abstract

Presents the need for, overview of Content Management (CM), expected functionality from a generic CM solution and a framework for CM. Highlights the critical successful factors and market predictions enabling ebook as the new genre of CM. Defines ebook and discusses its genesis, implementations, advantages and disadvantages, technologies – hardware, software and management software, evaluation of ebook constituents, impact on content/publishing industry, librarians/information professionals and libraries/information centers and DRM, standards, ebook publishers and their business models. Concludes that the success and failure of ebooks depends not only on acceptance by users, but also on the content industry's ability to view beyond traditional business models and recognizes that ebooks could be a new genre of CM.

1. Introduction

Information is the prized commodity that users are looking for. Information content, of many different types, is proliferating at such a rate that a solution to manage this resource is becoming an essential part of the enterprise infrastructure. Enterprises need to get a grip of the exploding content and manage it so that they can extract the value that is present in the information. Content Management (CM) is associated with the management of Web sites, Web pages, ecommerce transactions, emails, catalogs, technical documents, audio, video, databases, reports, etc. Content is an integral part of every business process, whether it is structured or unstructured. In the information economy, information content and processing of information content, must be carefully managed in the same way that physical assets and production processes have been managed in an industrial economy. In this information age, some form of CM solution is becoming essential for all enterprises, as the amount of digital content continues to proliferate. The objective of the paper is to provide an overview of CM and familiarizing the electronic book (ebook) technologies as a new genre of CM.

2. Overview of CM

Raw information becomes content when it is given a useable form intended for one or more purposes. Content may be any document, image, video, spreadsheet, record, or file that can be generated or consumed by customers, employees, partners or applications. The value of content is based upon the combination of its primary useable form, along with its application, accessibility, usage, usefulness, brand recognition and uniqueness. In the global economy, the content may be generated in or consumed in any number of countries or regions. Content has become the cornerstone to enable interaction between various communities and value chains in a global enterprise. These communities and value chains include employer and employees, buyers and suppliers, government and citizens, retailers and consumers, among other interactions.

CM is a new name for publishing with a core objective to get the right content to the right person at the right time and at the right cost. CM consists of a set of rules and processes for contributing, collaborating and controlling content. It includes document management through common workflows, media management based on a centralized content base and common tools for content creation and publishing. CM broadly encompasses the overall processes of content publishing, retrieval and reuse. It includes creating, tagging, submitting/contributing content, creating compelling applications, integrating a variety of content and personalizing it for consumers. The process of gathering usage metrics and managing the content throughout its life cycle also falls under CM (Peterindia, 2002). In its broadest sense, CM is a combination of software tools and business processes that allow enterprises to effectively manage and deliver large amounts of diverse information to different media in the most effective means. The workflow from author through production consists of writers, editorial review, formatting & graphics, legal review, staging server and production server. Global enterprises have three value propositions when it comes to CM: (i) smooth communication for delivering content to different consumers, (ii) collaboration between knowledge and content owners who may be in different countries and time zones and (iii) intelligence to analyze the content to determine how it should be used (Webb, 2002).

2.1. Functionality and framework of CM

The expected functionality from any generic CM solution includes: easy authoring and modification of content, true multi-user system, unlimited content contributors, ability to assign different content contributors to different sections, lock down design to corporate guidelines, revision tracking and comparison, flexible workflow and approvals, content scheduling, publish content to multiple sections or sites at once, image and video resource gallery, search facility, enquiry and requests handling, detailed site traffic reporting, scale to any size site, easy-to-read Uniform Resource Locators, Third Generation Wireless Application Protocols, Palm/Pocket PC and other device support, foreign

character sets, multilingual site support with automatic detection of browser default language, optional language translation workflow, ecommerce integration, ability to have discussion groups and chat facility, personalization of content, dynamic graphics generation, integration with multimedia software, automatic generation of navigation, custom metadata ability, Extensible Markup Language (XML) publishing and import, custom integration with third party applications, integration with digital asset management systems, portal solutions, search engines, intelligent caching to ensure maximum speed, easily deploy to multiple servers, multiple options for deployment to ensure maximum availability for clustering, load balancing, two tier production environment, symmetric multiprocessing and static site fail-over. Fig 1 shows the framework of CM.

3. Ebooks

Concepts like ebooks, ezines, ebanking and econtent became the buzzwords of the present day. Among digital products, ebook could be the new genre of CM based on the predictions, viz. the rapid developments in the global information infrastructure; an increasing volume of content published in digital format; the superior characteristics of digital publications in providing a rich multimedia environment with hypertext links and interactivity; and the development of technologies that allow the digital book to become as portable as the traditional pbook. The critical success factors for the large-scale distributors of electronic texts are: (i) finding a business model that works, one that is acceptable to users and generates money; (ii) reassuring publishers about their intellectual property rights (IPR) by providing controlled access to the texts, without making the working environment too slow; (iii) providing reliable and speedy access; (iv) providing convenient user interfaces; and (v) persuading academics to recommend using a service to the students, in the academic market.

The market predictions for the ebook growth rates are astonishing. Jupiter Research forecasted that there would be 1.9 million users of ebooks in US by 2005 (Flash, 2000). IDC predicted that the US ebook market would grow from US \$ 9 million in 2000 to US \$ 414 million in 2004 (Bartlett, 2000). Forrester Research estimated revenue from digital delivery of custom-pbooks, textbooks and ebooks account for revenues of US \$ 7.8 billion (17.5 per cent of publishing industry revenues) in 2005. Of this amount, only US \$ 251 million would come from ebooks for ebook devices (Forrester, 2000).

3.1. Genesis of ebooks

Ebooks are the third wave of electronic publishing. Firstly, indexes from secondary publishers became searchable databases via Dialog in 1970's and on CDROMs in 1980's. Secondly, when the Web became popular, primary journals began converting to Portable Document Format (PDF) for local printing or Standard Generalized Markup Language format for enabling users to hot links to other references for further study. The Web has made publishers to realize that they need not choose

between print and electronic publishing. Publishers are more commonly re-purposing the electronic files used in the production of print and some are re-engineering their editorial and production processes to produce files better suited to electronic products in the first place. Journals are commonly delivered by subscription over the Web; reference, legal and medical books are on CDROM or DVDROM and are becoming more Web savvy. In the context of ebooks, these are more often referred to a consumer product as a single volume, often a trade book that can be bought over the Web and read on a laptop or desktop computer, Personal Digital Assistant (PDA) or a dedicated ebook reading device.

3.2. Definition of ebooks

The development of ebook is still in its early stages. Formatting and other issues are unresolved with competing and commercial products in the market. Ebooks are a phenomenon of the last five years that has not been long enough for an agreed definition to evolve. Ebook can be defined in a more comprehensive way as a text in digital form or book converted in to digital form or digital reading material or book in a computer file format or electronic file of words, images with unique identifiers, metadata to be displayed on computer screen or read on a computer through a network or view on a desktop/notebook/dedicated portable device or read on all types of computers or formatted for display on ebook readers (Rao, 2001).

The word ebook is often used simultaneously to describe the content, format, reader software and reading devices. However, ebook content refers to the intellectual property component; ebook format refers to the document or file format; ebook reader refers to the software that enables one to read varying file formats on a range of hardware types; and ebook reading device refers to the portable hardware available for reading ebooks. Most ebook readers are tied to a particular ebook file format and can only read that format. Ebook readers are available for a distinct range of platforms: standard desktop PC or laptop; mobile and handheld devices; and dedicated ebook devices.

3.3. Implementations of ebooks

Ebooks are broadly grouped in four implementations: (i) Downloadable ebooks: the contents of a book are available on a Web site for downloading to the user's PC; (ii) Dedicated ebook readers: the book's contents are downloaded to a dedicated hardware device that has a high-quality screen and special capabilities for book reading; (iii) Web-accessible ebooks: the ebook remains on the provider's Web site and can be accessed for a fee. Readers may purchase the books to receive indefinite access; and (iv) Print-on-Demand books: the contents of a book are stored in a system connected to a high-speed, high-quality printer, from that printed and bound copies are produced on demand. The

contents may be available on a chapter-by-chapter basis to enable the creation of single copies of customized books. Print-on-Demand technology has existed for some time, where the user does not need the entire book.

3.4. Advantages and disadvantages of ebooks

Many of the advantages of ebooks are inherent in the format of electronic devices; offer a level of features and flexibility that are impossible through pbooks and progressively becoming an alternative media for CM. The advantages for various target groups viz. end user/reader, publisher and author (Cox and Ormes, 2001) are discussed in the following sections.

- *The end user/reader:* (i) availability/access to titles: downloading a title from the Internet is quicker and more convenient than visiting the bookshop or library. The online shop offers 24/7 services and the titles will never become out of print and are lent out in a library (subject to copyright license methods); (ii) searching of text: it becomes easy to find passages, keywords and definitions in the text; (iii) customization: offers flexibility to change display brightness, font size and style (especially for visually impaired) and to add markup, annotations and links, (iv) portability: potentially a large number of electronic titles can be carried around at once either in memory or on a personal virtual bookshelf on the network; (v) multimedia facilities: audio, video (voice, music, sound, graphics, images or video clips), and arbitrary extension with external applications enhance an ebook in an integrated way. The authorship paradigms might be a shift from the individual author to the team; and (vi) environment: despite production and operating resources, ebooks may require less environmental resources such as wood and energy in the long run.
- *The publisher:* (i) publishing speed: the publishing process becomes quicker with electronic media, if distributed via the Internet and easy to distribute updates; (ii) publishing cost: the cost of printing, binding, inventory or shipping, disappear; (iii) storage requirement: no physical storage room is required for the produced copies; (iv) usage studies: with the aid of ebooks reading habits of users can be monitored.
- *The author:* (i) publishing: easier for authors to publish directly to niche markets, without a publisher, on the Web; (ii) feedback: enhanced direct contact to readers becomes a reality, through direct author publishing and integrated electronic feedback by readers.

The disadvantages can be traced to one of the two causes: (i) the shortcomings of current ebooks technology and its derivatives and (ii) in congruencies that ebooks pose with current user expectations and conceptions of how books are handled. The typical issues that make ebooks less user friendly than their paper counterparts are the display, form factor and haptic feedback.

- *The display:* (i) resolution: the typical screen resolution is 100 dpi that is far below the resolutions of 300+ dpi used in print. The Microsoft's ClearType solution offers good

readability without high screen resolutions; (ii) contrast and brightness: these are still far better on printed media. The E-Ink projects may be able to improve these factors for electronic devices; and (iii) color: for portable devices such as ebooks, color intensity and color ranges are not of the quality of printed documents.

- *The form factor*: (i) weight: an ebook is easy to carry than a dozen printed books, but it is still heavier than a single paperback volume today; (ii) dimensions: the physical dimensions of an ebook are fixed and cannot be changed individually for each title; (iii) parallel use: to view several books next to each other requires several hardware devices; (iv) power consumption: the battery life determines the access to material on an ebook and utilization of solar power as additional energy source could be useful; (v) fragility: ebooks are far more liable to damage when dropped, bent or otherwise abused; and (vi) flexibility: ebook hardware is rigid and nonflexible.
- *Haptic feedback*: (i) thickness: visualizing the amount of pages that are behind or in front of the current page is relatively easy, but conveying the haptic feeling of this thickness is much more difficult to achieve; (ii) browsing: to quickly judge whether a book is suitable for buying, people tend to thumb through a book quickly. A lot of effort has gone into replicating this navigation metaphor on ebooks; and (iii) paper and print quality: Ebook titles cannot use this haptic quality indicator for a large sales volume.
- *Other factors*: (i) cost: the dedicated ebook readers are expensive and there is no break through in sales to reduce the cost; (ii) technological change: there is a high risk of buying an obsolescent model of ebook reader; (iii) limited availability of titles: at present a limited number of titles available for download; and (iv) compatibility: there is no compatibility across different hardware/software for using the titles.

4. Ebook technologies

Ebook technologies comprise of (i) ebook hardware, (ii) ebook software and (iii) ebook management software.

4.1. Ebook hardware

Ebooks can be read by using a dedicated reading device, or a multi-purpose device, or a desktop or laptop PC.

- *Dedicated reading device*: basically consist of a large, touch-sensitive LCD screen inside a book or tablet-sized plastic casing, with a few simple buttons or a switch for moving forward and backward in the text, plus onscreen menus for advanced functions like bookmarks, highlighting, annotation, key word search and dictionary look up. Dedicated reading device screens usually hold enough texts and device owners must purchase specially formatted

content either through their PCs, using online bookstores or directly from the device maker via a built-in modem. A chip containing a unique ID allows content retailers to encrypt each purchased title uniquely for download to that device. The example of dedicated reading devices is Gemstar (available in two models: GEB 1150 and GEB 2150).

- Multi-purpose device: includes PDAs and Pocket PCs. The examples: (i) PalmOS devices can read ebooks using PalmOS software. Readers buy content from the online bookstore and transfer it to their devices following the same HotSync procedure used to install new software. Only 14-30 lines of text fit on each page that results in frequent page flipping; (ii) The Hiebook is inexpensive, light and has a larger screen than any of the other multi-purpose readers; (iii) Pocket PC devices from Casio, Compaq and Hewlett-Packard are heavier and bulkier than the PalmOS devices. They have larger color LCD screens that can take advantage of Microsoft's ClearType system.
- Desktop or laptop PC: An innovation for Windows PC is a tablet PC that has a touch screen. The main method of input is handwriting recognition similar to Transcriber on the Pocket PC. The Tablet PC is unique in its support for ink notes, making it easy to add rich handwritten notes and sketches to ebooks.

4.2. Ebook software

Ebook software is at three levels, viz. ebook reading software, ebook creating software and ebook management software.

The ebook reading software includes:

- Adobe Acrobat eBook Reader: available free to download on Windows and Macintosh platforms. It reads .pdf file format and supports CoolType font rendering technology. It has five distinct rights that publishers can enable, disable or otherwise modify: copy, print, lend; give; and text-to-speech capabilities. It works in tandem with Adobe Content Server software to secure the transfer and consumption of digital content.
- Microsoft Reader: available free to download on Windows, Pocket PC and Tablet PC platforms. It reads .lit file format and supports ClearType technology that provides the best on-screen readability on multiple platforms. It is capable of reading encrypted titles. Unlike Adobe, Microsoft provides a specific setting that enables the user to adjust the size of fonts they will see.
- Palm Reader: Palm Reader version is free while Palm Reader Pro on cost mode. It is available to download on Windows, Macintosh, Pocket PC and Palm OS platforms. It reads .pdb file format. Both provide bookmaking, annotating, changing different font sizes, auto scrolling, user selectable screen orientation and absolute page numbers. Both support security encryption, but do not support printing.

The ebook creating software includes:

- Adobe tools: allow one to create once, then distribute electronically or in print. Adobe FrameMaker - for large, structured and content-rich documents; Adobe PageMaker - for reports and business documents; Adobe InDesign - for reports and business documents; Adobe Acrobat - to convert publications to Adobe PDF based ebooks; Adobe Acrobat Capture - to make rare, out-of-print and paper publications easily accessible in digital form.
- Read in Microsoft Reader add-in for Microsoft Word: enables one to convert any Word document into a Microsoft Reader format ebook.
- Palm ebook Studio: allows users either create ebooks from scratch, or cut and paste information from existing documents, such as Microsoft Word or any application that supports Rich Text Format, into the Palm ebook Studio. It is available for Windows, Macintosh computers and supports the use of graphics and images. In addition, the application offers a choice of font styles, type sizes and formatting options for customizing ebooks.

The ebook management software includes:

- Adobe Content Server 3: provides (i) easily lend digital content with the new library feature that offers automated check-out, check-in of titles and can be integrated into Web Catalog systems, (ii) manage just one encrypted Adobe PDF file for multiple use and create usage rules for each transaction, to simplify CM and decrease storage requirements, (iii) protect copyrighted content with 128-bit encryption, (iv) use the Electronic Book Exchange (EBX) Digital Rights Management (DRM) system that supports numerous business models through a set of rules including copy, print, lend, expire and read aloud and (iv) set content to expire on a specific date or after a specific amount of time.
- Microsoft Digital Asset Server (DAS): It is the DRM solution behind the Microsoft Reader .lit format. It uses the Extensible Rights Management Language (XrML) from ContentGuard. It includes DAS eCommerce as front end and DAS Server as back end. DAS eCommerce is installed on the eBookStore site that identifies the DAS provider, initiates the process to secure and download each purchased ebook to the consumer. DAS Server is installed on DAS Provider server architecture, used to secure and download each purchased ebook to the consumer. DAS is available to interested publishers and resellers through the digital rights solution providers.
- Palm Retail Encryption Server Software (PRESS): provides publishers and online retailers with the components they need to sell encrypted Palm Reader ebooks on their commerce-enabled websites. PRESS is available for use on Windows NT and Unix/Linux servers.

5. Evaluation of ebook constituents

A number of portable ebook devices in a range of shape, size and price are available. They have little or no interoperability. The criteria for choosing the ebook constituents could be based on (i) functionality of the reader software from the user's perspective, i.e. annotations, bookmaking, copy and paste, highlighting, search, dictionary/glossary lookup, scalable text, print, output content to word processor and transactional support; (ii) hardware device upon that the ebook is viewed as color/grayscale, network connection, support for graphics and large documents with enough memory to display; (iii) production to be flexible for ebook producers including conversion from existing formats and export to multiple formats; (iv) output details of the nature of the ebook file and the authoring features, including read-only, forms, view and play back of rich media files, support for complex layouts, range of platforms and devices availability, hyperlinks, maintain pagination, digital signatures support. The feature list for the products against specification was provided at table 1.

6. Impact of ebooks

Despite the limitations of various formats and the current lack of ease of transfer of ebook contents between devices, there are a growing number of applications in government and academic enterprises, education, multiple languages and for people with visual impairments. Journals, technical documentation and governmental publications are seen as being a prime area for ebook technology as these are areas where large amounts of content are produced and updated regularly. The main player in the education market is MetaText arm of netLibrary. Its eTextbooks are portable, editable, allow users to collect and make notes with ease, to be tailored by the teacher for the courses they teach. As a result eTexts are potentially adaptive to students needs, goals and content demands. Huge potential lie for ebooks is in support for multiple languages in Spanish, Portuguese and Chinese. These large language groups have not been well served by publishers in the United States and Europe. Support for people with visually impaired include (i) to replace the traditional audio book available in most libraries, (ii) as reader hardware and software becomes more sophisticated, font sizes and weights can be altered so that they are more easily read by people with bad eyesight, (iii) a Braille reader developed by National Institute of Standards and Technology, consists of a refreshable Braille system that receives digital input from a device such as an ebook reader, PDA or a desktop computer and converts it to a continuously updated Braille output. It allows the user to access ebooks, documents, email and Web pages.

Read-anywhere ebook is to become a reality; standards are needed for content formats, file formats, DRM, distribution and book product information. Ebooks will have impact on (i) content/publishing industry, (ii) librarians/information professionals and libraries/Information Centers (ICs) and (iii) DRM.

6.1. Content/publishing industry

Currently, ebook industry is dominated by the concerns of publishers and the objectives of ecommerce. Traditional book publishers are increasingly looking at the potential of digital publications to enhance the reader's experience and looking to ensure that they themselves remain abreast of changes in publishing practice. The traditional business model used by the content/publishing industry's hierarchical structure of writer, agent, editor, publisher, printer/binder, distributor and retailer is imploding. The ebook enables anyone to create books without the huge capital required to service this established order. Once an ebook is formatted, it can be distributed over the Internet without the conventional distribution and printing costs. Hence, publishers no longer need to contract with a printer/bindery, no need of warehouse, national retail distributor, sales representatives and bricks-and-mortar booksellers. Also, writers can submit manuscripts to publishers electronically, without an agent. A publisher can build an ecommerce website, connect personally with each customer, deliver ebooks direct, worldwide, 24 hours a day and 365 days a year.

Due to the advantages, ebook is likely to replace certain categories of book and/or journal publication. The key factors are the possibility of rapid publication, updating and the economics of electronic distribution. These facts mean that electronic publishing is ideal for publishing data or information that has a limited period to put to use, needs to be updated frequently and directed at known, limited target audiences. Abstracting and indexing services is an interesting example of how early electronic publication through the online databases has led to that form of access, rather than the printed version, being the primary form of access. Now that online services are moving to Web based access, direct end-user searching may increase and few, publicly funded databases may become freely available, as Medline. Scholarly journals are also increasingly moving to electronic publication and are likely to do so in increasing numbers. Some are now only available in the form of Web publications and the tendency is towards new journals in limited fields being started up by scholars in a field with either tacit or explicit support from their institutions, rather than by the commercial publishers.

Once ebook content is ready, it would be stored in the digital equivalent of a warehouse filled with many titles. From that invisible warehouse, individual titles can be ordered, picked, invoiced and shipped; i.e. the digital objects are moved or activated for the consumers or libraries/ICs that have purchased them. There are four distinct parts to this process: content identification or discovery; a commercial transaction involving order and payment; a rights transaction that delineates use; and delivery of content to the supported reading platform(s). It is certainly possible for a single vendor to perform all those four functions, as when a very large publisher hosts own content on its proprietary platform, provides an online catalog and takes orders or subscriptions directly from customers. But this will remain an exception (Sanders, 2002).

Broadly, ebook vendors fall into two groups: (i) full service hardware, software and content providers - Everybook (Everybook), NuvoMedia (Rocket eBook) and Softbook Press (Softbook). These vendors cover trade press (novels, romance and self-help), periodicals markets and pursuing partnering deals; and (ii) software and content-only providers – Librius that offered its own viewer until recently and Glassbook that focused solely on conversion, library control and viewer software. Both vendors support ebooks for Palms, Windows CE devices, notebooks and unspecified information appliances (Perlin, 1999).

The primary challenge facing ebook producers is the development of open standards. It is hoped that an early adoption of industry wide standards will avoid conflicting standards; simplification of ebook formats, methods of delivery and ecommerce systems aids ebook market to grow and mature. It is critical for distributors to ensure that ebooks are available on and exchangeable between multiple platforms.

6.2. Librarians/information professionals and libraries/ICs

Many information professionals are excited about the potentiality of ebooks, viz. compact storage that results in saving on shelf space, saving on staff time in issuing items if the book could be downloaded from the catalogue, expansion of the collection, image of the library/IC is enhanced by adoption of new technology. Searching, linking and currency are highly important and text is in short, discrete segments, ebooks are the best solutions for encyclopedias, almanacs, gazetteers, technical manuals, handbooks, etc. From an IC perspective, print will coexist with electronic publications. In managing collections, professionals will continue to rely on their professional skills to select the materials that serves their users and when to substitute digital for print, the balance between ownership, access, the advantages of local hosting of databases versus hosting by a third party or vendor, how to archive, preserve digital and analogue materials. A key decision will be the integration of access to analogue and digital materials so that users can operate within a seamless information space. But with the increasing move towards digital ICs, the issue of a common user interface becomes more complex. This is partly because the range of information resources available to users is more disparate including analogue and digital resources. The various digital resources such as full text databases, bibliographic or citation databases, multimedia electronic documents, ebooks and electronic journals have different search interfaces and more distributed. This complexity is exacerbated by differences in proprietary systems, operating systems, local and wide area networks, database structures, search and retrieval languages, standards and protocols (Lim, 2000).

Ebook technology creates few challenges in circulation (Rowse, 2000; Rao, 2001). Ebooks, when downloaded, are locked into one specific device due to encryption and each title on each reader has to be paid for, so users cannot select specific titles to take home on the reader. This can be overcome by creating theme readers on that various titles to be loaded. The proprietary marketing of ebooks

creates problems for long-term collection development, preservation and access. New licensing and distribution agreements will need to be developed with ebook vendors including simultaneous users. In addition, licensing vs. ownership issues of ebook content will have a significant impact on the archival interests of many libraries/ICs. The netLibrary offers two pricing models for libraries/ICs: an in perpetuity price and an annual renewal price. The evolution of copyright laws in the digital environment will have vast significance for libraries/ICs in terms of their ability to loan and transmit or copy ebook content.

6.3. *DRM*

The DRM is the principal issue for ebook developers especially as the number and types of media that ebook formats support increase. The basic elements of a good DRM solution are a secure file format, access security and user authentication, transmission security, usage rules that are enforced after purchase and encryption.

The DRM distribution cycle begins when an author creates an original work and submits it to an ebook publisher. The publisher converts the work to an ebook format, employs DRM encryption to lock the file and generate a unique encryption key. The ebook distributor manages the encryption key and locked file, ensuring that unauthorized users cannot view the protected work. The ebook distributor transfers the work to an ebook retailer, who then sells the secure ebook online and offers ebook buyers an easy way to purchase keys to decrypt and read the work. The ebook buyer who visits an ebook retailer website can purchase the work and read it, using an ebook reading device, after unlocking the file with a DRM key. The select market leading DRM providers and solutions include: Adobe PDF Merchant and WebBuy; Xerox/Microsoft's ContentGuard; Reciprocal.com; SoftLock; netLibrary; InterTrust MetaTrust Utility; LockStream.com; and ebook publisher solutions such as MightyWords.com. Based on competing formats and emerging open-source specifications, industry is concerned to bring out a flexible DRM specification.

While negotiating ebook contracts, authors want acceptable compensation from all players in the DRM distribution cycle if any one of them negligently fails to encrypt or protect the author's encrypted works. Ebook publishers will seek to limit liability for loss in value of an author's copyright as a result of preventable and/or foreseeable piracy. Ebook DRM solutions are being coupled with rights clearinghouses that connect publishers, agents, sub-agents and book scouts worldwide. Companies such as rightscenter.com and reciprocal.com provide secure receipt, storage, tracking and fulfillment of consumer orders for digital goods distributed through Web retail storefronts. Audit records of keys sent to ebook consumers are sent to the digital clearing service; this information is used to generate reports and distribute financial payments to publishers. Other techniques forward transactions in secure DigiBox containers that ensure everyone who is supposed to be paid is paid and audit data is immediately available. The implication of real-time payment and transaction-tracking means that

standard publishing clauses whereby royalty payments are held for months to facilitate publisher accounting systems will no longer be justified with regard to ebooks (AAP, 2000; Neylon, 2001; Pimm, 2002).

7. Ebook standards, interoperability, publishers and their business models

7.1. Ebook standards and interoperability

There are five distinct areas where standards are required for the continued development and maturation of ebook as a format and as a commercial reality. The five areas are: content format standard, file format standard, DRM standard, distribution standard and book product information standard (Potman, 2000)

- Content format standard: there are two main standards: (i) PDF – developed by Adobe Systems Inc. It is based on the postscript standard to describe text and images in a device independent and resolution independent manner. It has been implemented by Glassbook and most other ebook publishers making it currently the format of choice and (ii) Open eBook Publication Standard (OeBPS) - developed by the Open eBook Forum (OeBF), an association of hardware and software companies, publishers, authors and users of ebooks. It is based on XML, HyperText Markup Language (HTML) and Cascade Style Sheets and is growing in acceptance.
- File format standard: currently defined by individual device manufacturers. There are two broad categories: (i) Adaptive (XML/OEB) – supported by Web browsers (HTML), Microsoft Reader, Gemstar eBooks, Palm Digital Media Reader and Franklin eBook Man; and (ii) Fixed Page (PDF) – supported by Acrobat Reader, Adobe eBook Reader and Print-on-Demand. The other file formats include: ASCII, Palm formats, Universal Book File format, etc.
- DRM standard: A well developed area with a number of standards in use and testing: (i) Electronic Book Exchange (EBX) System - developed by the EBX working group and accommodates a variety of content formats for ebooks, including OeBPS and Adobe PDF. It is based on public and private key encryption and defines protocols for distribution between publisher and bookseller, delivery to consumers and also lending. EBX see the ebook as a distinct unit and cannot take into account the rights for elements within the book such as for fonts, images, audio and video (Pack, 2001); (ii) Extensible rights Markup Language (XrML) - developed by ContentGuard. It is based on XML and describes the specifications for rights, fees and conditions for the use of content. This has been designed to cater not only to the ebook market but also in all situations where digital rights need to be applied and managed; and (iii) Open Digital Rights Language (ODRL) has a similar role to XrML and attempts to set up frameworks that cater for the social, technical, legal and business aspects of rights for all electronic content (Iannella, 2000).

- Distribution standard: EBX System – developed by EBX work group. It defines protocols that allow for sale, transfer and lending of ebooks. It is currently being tested at Barnes and Noble and used for managing rights for the Glassbook eBooks on sale.
- Product information standard: ONIX International – resulted out of a collaboration between three separate initiatives in the US, UK and internationally, comprising of publishers and ecommerce vendors. ONIX is an XML based standard for representing book industry information and includes elements for representing information such as product numbers (ISBN, ISSN), product format, series information (useful for journals and editions), titles, multiple authors, multiple rights holders, subject, audience, publisher information and dates and suppliers trade data.

7.2. Ebook publishers and their business models

The current business models for ebook vendors vary considerably. A handful of vendors market to libraries/ICs, but few are to individuals. The business models of vendors claim a role for libraries/ICs, but it is not clear that these are truly considered a viable part of their marketing plans. Table 2 provides a select list of ebook vendors, their business model, product type and audience.

8. Conclusion

Ebooks comprise a fascinating and useful technology, but it doesn't command uncritical acceptance. Like any other publishing or broadcasting technology, this development alters the balance of power between those who produce and publish ideas and those who want to consider and acquire them. The ebook industry shows great promise and will be an interesting segment of electronic information to observe as it develops and mature. Concludes that the success and failure of ebooks depends not only on acceptance by users, but also on the content industry's ability to view beyond traditional business models and recognizes that ebooks could be a new genre of CM.

References

- AAP (2000), "Digital rights management for ebooks: publisher requirements",
<http://www.publishers.org/home/drm.pdf>
- Bartlett, M. (2000), "Ebook market set for explosion – IDC study",
<http://www.newsbytes.com/news/00/159594.html>
- Cox, A. and Ormes, S. (2001), "E-books", <http://litc.sbu.ac.uk/publications/libs/libs96.pdf>
- Flash, C. (2000), "Will ebooks every really catch on?",
<http://www.techweb.com/wire/story/TWB20001214S0000>

- Forrester (2000), "eBooks will flop, but print-on-demand and digital textbooks will thrive",
<http://www.forrester.com/ER/Press/Release/0,1769,470,FF.html>
- Iannella, R. (2000), "Digital rights under down", In Changing the fundamentals of reading,
Proceedings of 3rd Annual Electronic Book Conference and Show, pp. 88-93.
- Lim, E. (2000), "The last book: the delivery of future content",
<http://www.alia.org.au/conferences/alia2000/proceedings/edward.lim.html>
- Neylon, E. (2001), "First steps in an information commerce economy: digital rights management in the
emerging ebook environment", <http://www.dlib.org/dlib/january01/neylon/01neylon.html>
- Pack, T. (2001), "Digital rights management: can technology provide long-term solutions?" EContent,
May, 22-27
- Perlin, N. (1999), "Beyond the bleeding edge: ebooks",
<http://www.stcsig.org/oi/hyperviews/archive/99Fall/994cedge.htm>
- Peterindia (2002) "Content management: an overview",
<http://www.peterindia.com/ContentManagementView.html>
- Pimm, B. (2002), "Author's rights in the ebook revolution",
<http://www.gigalaw.com/articles/pimm-2000-10-p1.html>
- Potman, J. (2000), "eBook standards", In Changing the fundamentals of reading, Proceedings of 3rd
Annual Electronic Book Conference and Show, pp. 72-79.
- Rao, S.S. (2001), "Familiarization of electronic books". The Electronic Library, Vol. 19, No. 4,
pp. 247-256.
- Rowsell, G. (2000), "The ebook: options and issues",
<http://www.conference.co.nz/LIANZA2000/papers>
- Sanders, G. (2002), "The host with the most: ebook distribution to libraries-1",
[http://12.108.175.91/ebookweb/discuss/msgReader\\$1139](http://12.108.175.91/ebookweb/discuss/msgReader$1139)
- Webb, D.B. (2002), "Content management models for global enterprises",
http://www.lisa.org/archive_domain/newsletters/2002/1.4/webb.html

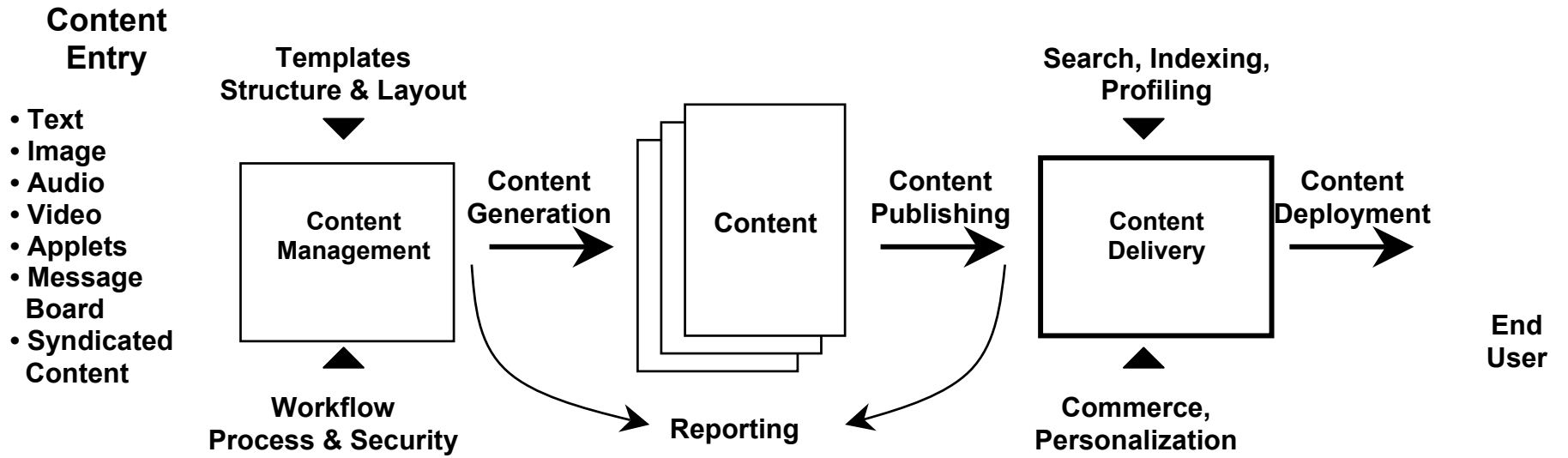


Fig. 1: Framework for content management

Table 1. Feature list for the products against specification

Features	Products							
	Acrobat eBook Reader	Acrobat Reader	Franklin Reader	Microsoft Reader	Microsoft Word	Mobipocket	PalmReader	RCA E-book
Functionality								
Text annotations	Yes	No	No	Yes	No	No	Yes	No
Graphical annotations	No	No	No	Yes	No	No	No	Yes
Bookmarking	Yes	No	Yes	Yes	No	Yes	Yes	Yes
Copy and paste	Yes	Yes	Yes	Yes	Yes	No	No	No
Highlighting	Yes	No	No	Yes	No	No	No	Yes
Print	Yes	Yes	No	No	Yes	No	No	No
Search	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Word lookup	Yes	No	No	Yes	No	No	No	Yes
User defined text size	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Output to word processor	Yes	Yes	No	No	No	No	No	No
Transactional support	No	Yes	No	No	No	No	No	No
Hardware								
Color/grayscale display	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Graphics support	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
Network connection	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
View large files	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
Production								
Convert from existing formats	Yes	Yes	No	Yes	Yes	Yes	Yes	No
Export to multiple formats	Yes	Yes	No	Yes	Yes	No	No	No
Output								
Read-only content	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Forms support	No	Yes	No	No	No	No	No	No
Rich media support	No	Yes	No	No	No	No	No	Yes
Maintain pagination	Yes	Yes	No	No	Yes	No	No	No
Hyperlinks within book	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Hyperlinks between books	Yes	Yes	No	No	Yes	No	No	No
Hyperlinks to the Web	Yes	Yes	No	Yes	Yes	No	No	No
Digital signatures	Yes	Yes	No	Yes	No	No	No	Yes
Support for complex layouts	Yes	Yes	No	No	Yes	Yes	No	No
Range of platforms and devices	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Support complex typography	Yes	Yes	No	Yes	Yes	No	No	Yes

Table 2. Select list of ebook vendors, their business model, product type and audience

Vendor	Business model	Product type	Intended audience
NetLibrary	Subscription to copies of individual titles with access of single-user per copy and a premium for ownership	Ebooks covering a broad range of disciplines	Libraries and academic institutions
Questia	Flat monthly subscription rate for access to the entire database. Marketing only to individuals, not libraries	Scholarly, high-quality books and journal articles in the liberal arts	Undergraduates, public library patrons and other individuals
Ebrary	Free browsing of the entire database with fees for printing and downloading. Marketing both to libraries and individuals. Anticipating that libraries will establish accounts with a maximum amount to spend per user, identified by patron ID. Library to receive 5% of revenue generated from the library's account	Archive of resources for term papers. Starting with science, technology & medicine. Marketing bits of information or entire books and articles	Library users of all sorts, including undergraduates and researchers. Both libraries and individuals expected to open accounts with Ebrary for access to its service
Book24X7	Annual subscription model that is FTE-based; allowing BCR to aggregate FTE for academic institutions for greater economies. Pay for any new content added to the service during the subscription year at renewal the following year	Technical ebooks, journals and reference materials. Primarily information technology	Libraries and academic institutions; public libraries
iBooks.com	Short and long-term subscription to ebooks; sales of printed works. Marketed to libraries and academic institutions. Sales directly to individuals	Digital technical reference books in information technology. Online digital bookstore for discounted print copies	Library patrons, corporate customers, etc.
Cognet	SPARC initiative with favorable pricing for academic institutions. Markets annual subscriptions to libraries	Ebooks for major books and reference works in cognitive science from MIT Press and other publishers. Other relevant journals and cognitive sciences materials	Cognitive science community of students and scholars