Content Management in Digital Libraries: Need of the Hour

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Submitted: 22 November, 2013 Revised: 11 April, 2014 Accepted: 20 May, 2014

Abstract

Content management is relatively a new term that includes the creation, profiling and approval of contents and finally publishing them over the Internet. It is most commonly used to run websites containing blogs, news, and shopping. Content management systems are the computer program which allows publishing, editing and modifying content as well as maintenance from a central interface. As they provide many advantages over traditional method for coordinating and contributing to different content repositories, library and information centers also have started to avail its benefits for their services. The concept of content management and Content Management Systems (CMS) is discussed in this paper along with its utilities in library and information centers.

Key Words: Content Management, Content Management Systems, Digital Libraries, Information & Communication Technology, Web CMS.

Introduction

The term "Content" is used for the published information. Earlier, published information was used to indicate published books or the journals. But with the advent of computer and communication technologies, now it is possible to publish information online and many of the publications worldwide now are publishing e-books and e-journals.

With the advancement in Information and Communication Technology (Dhiman, 2003: Dhiman & Rani, 2012), we have the emergence of digital libraries. Today, the information is being created and publishing on a mass level where "the viability and extent of usefulness of a digital library is to depend upon the critical mass of its digital contents. The information contents in a digital library may include virtually any kind of electronic media - text, image, graphic, video, etc., licensed database of journals, articles, abstracts and the description of physical collection" (Mahapatra, 2012).

Naazi & Nisha (2005) mention that, "theoretically any object from a text fragment to an animal in zoo may be rendered digitally and thus, there is no limit to the types of contents that may be held by a library". However in practice, digital contents may be of following three types:

- Contents created and existing primarily in machine readable format.
- Contents converted from the traditional format into digital, for example, print text, pamphlets, manuscripts, motion pictures and recorded sound.
- Access to external contents, not held in-house, by providing pointers to web sites, publisher's services, password to consortium or other collaboration from commercial organizations.

As there is the availability of much and abundant digital contents, there arises the needs of content management. Content management that refers to the system and processes whereby information is created, managed, published, and archived, is mostly associated with the web publishing because it is so different from other types of publishing that content management has come to encompass such a wide variety of functions.

Why manage contents?

Though the Content Management (CM) term has emerged during 1990s, but it got popularity recently with the advent of web publishing. CM increases document management efficiencies to capture, manage, store, preserve and deliver contents. Content management has now become front end centre because of the availability of new technology and the overabundance of content on networks and Internet,

Warren (2003) has put the following reasons why organizations must now manage contents:

- **People often share the same content –** Sharing of the contents among friends and colleagues through a certain network has grown significantly these days, be it a report, a design, a layout, or a well written paragraph, others will want to read it, revise it, copy all or part of it, distribute it, collaborate on it, or use it in multifarious ways. Therefore, content management is inevitable for effective sharing of valuable contents.
- **Different publications often share the same content -** Content "reuse" is the buzzword of the day. In the words of Warren (2003), one need to run into the situation where the same basic content exists in multiple places, gets edited by various people at different times, and one may end up with no clear idea of which is the "real" content. Maintaining multiple versions of what is *supposed* to be the same content not only wastes time but it also exposes the all kinds of risks— like when the reader gets bad information because the wrong version is published.
- **People need to find information –** The availability of full text literature is really overwhelming. The more content that people have access to, the more difficult it becomes to sift through it and find what they need. To find content, it needs to be organized and ordered.

Warren tells *people* organize content. New technologies are emerging that can organize content for you, but today it requires a human brain. Keep in mind that making content easy to find requires both automated processes and a people processes.

Content changes –The contents are often created by the original author and are subsequently edited, approved, and published. While some content's useful life is practically infinite, like that in a classic novel or historical

archives—much of the content created has a limited useful life. A piece of news may become irrelevant in as quick as a day, while other content may be relevant for years. Most contents eventually become obsolete and needs to expire, be archived, or be destroyed or deleted.

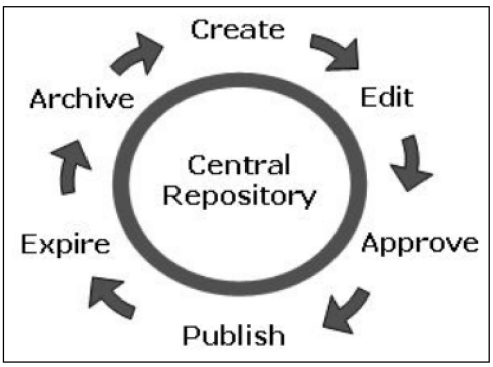

Figure : Content Cycle *(Source: Warren, 2003)*

However, the two main reasons for managing content well are *efficiency* and *effectiveness*. Now it is easier for people to share content across networks or across the world, however, the need is for more efficient ways to find it and use it in publications. So, we need to make sure that the content that is out there is well written, well targeted to the audience, accurate, and current. In this regard, the content management helps us do the same.

As far as the libraries are concerned, electronic communication facilities provide opportunities for libraries to acquire and or access more information, both internal and external. This results into a very large body of contents to pile up, which require a strategy for information building and access. Library and information centres have to analyze, classify and capture the key knowledge and support the goals of the parent organization. They can achieve this with the help of content management that is one of the most important and critical activities in digital libraries. It involves the creation, storage and subsequent retrieval and dissemination of information or metadata. But Varalakshmi (2004) mentions that libraries are primarily concerned with the Application Content Management which mainly involves content aggregation, content description (metadata management) and delivery content specification.

Benefits of content management

Content Management (CM) is a critical success factor for implementing any organizational data that is content and process centric. The processing of the content is necessary to approve the documents and positioning them. CM does the following (Varalakshmi, 2004):

- It streamlines the incorporation of changes and updating of data on web pages;
- It allows greater consistency and increased flexibility;
- It reduces duplication of information;
- It provides greater capacity for growth with increased security;
- It ensures consistency in design and supports navigation by different user groups;
- It provides interaction and sharing of electronic information that is deeper in character.

Thus, libraries being the information process centric can apply CM and achieve more benefits.

Content management system

The term content management has been a constant source of ambiguity. Parapadakis (2000) states that, "it is being used to describe both the management of the content within these intelligent objects, for example, the management of the authoring process of a report, as well as describing the management of the objects themselves in the context of a larger system", for example, the composition of a web site. However, Varalakshmi (2004) mentions - content management has gone by many names such as Knowledge Management, Document Management, Software Configuration Management, Web Content Management, Digital Access Management, Digital Rights Management, with subtle difference but aiming at the similar target information i.e. content objects, files, associated material or relational data.

Warren (2003) reports that software products called "content management systems" appeared on the scene in about 1995, so they belong to a relatively new software category. CMS software came about largely because of the need to manage content destined for the web. As the software matured, the developers and marketers began to recognize that content management is not just a web-related issue. However, even today, most of the CMS software products on the market focus primarily on managing content for the web, with only a handful of products that deal with files destined for print.

Clark (2007) defines "Content Management System (CMS) as a system that approaches the problem of content management by using markup, metadata, and tools to break documents into component parts, to a level of granularity, for example, the paragraph level, sentence level, word level, set by organizationally defined information models, and labeling each part with metadata that describe its meaning and relationships to other content". Contextually, the same content can then be automatically assembled in different genres, with different presentations, in different media, and in different forms.

Content Management System (CMS) has two elements - Content Management Application (CMA) that is the front-end user interface that allows a user, even with limited expertise, to add, modify and remove content from a web site without the intervention of a webmaster; and Content Delivery Application (CDA) that compiles that information and updates the web site (Anonymous, 2013).

Because of its various features and applications, a CMS provides many advantages over traditional methods, particularly when distributed teams of users are responsible for coordinating and contributing to different content repositories. Various recommendations are given for achieving CMS benefits (Anonymous, 2010):

- "CMS empowers content that involves making better use of information and putting control in the hands of content owners. Using a CMS, business users can update their online information quickly and efficiently without technical intervention. Having full content ownership expands the opportunities for subject matter experts to make their information available to their specific audiences. A CMS can repurpose content into multiple formats and helps to ensure disability compliance is met. Content repurposing takes a single source of information and applies the necessary changes to automatically generate various outputs including standard HTML, printer friendly HTML, handheld WML, PDF, and XM".
- "CMS significantly lowers the costs associated with managing information online. Content creation is less costly as business users can directly contribute information online without going through an intermediary. Besides, IT specialists are no longer required to reconfigure content from one program to a suitable online format. Removing steps in the process frees up expensive technical persons for more specialized tasks. Further, managing

information is less costly as contents are maintained by business users and standard processes are automated. Common tasks, like checking for dead links and archiving old pages are done transparently by the CMS. Other tedious tasks like generating navigational menus and enforcing information architectures also do not require technical labor when using a CMS".

- Additionally, the content publishing becomes less costly as information is scheduled in advance to be published at a specific date and time. Associated images and files for contents published by the CMS reduce the technical burden of finding the necessary assets. CMS is also capable of expiring content at a predefined time.
- "CMS provides new ways to increase revenues. Here, new opportunities arise when information is published online in a matter of minutes as compared to hours or days. CMS also improves the speed to publishing for content online. Besides, the fresh content also encourages return customers".
- "CMS also improve accountability by audit trail and version control. CMS institutes full accountability and helps to motivate employees to complete work in a timely manner. Business users are given peace of mind that errant actions will not lose information with version control".
- "Contents in CMS are presented within pre-defined templates whenever possible, which provide a mechanism for maintaining a consistent look and feel, thereby creating a professional image of uniformity for the site visitor. Brand integrity is enforced with a CMS by limiting available logos and layout design in a manner consistent with corporate policies".
- Table 1 based on Anonymous (2010) gives clear ideas - what benefits are there with CMS and what we cannot do without CMS in changing environment.

Table 1. Can be done and cannot be done with / without CMS

Items	With a CMS	Without a CMS
New Page Creation	Facilitates the creation of a new page based on a pre-defined default along with the automatic updating of all navigation links.	A copy of the existing page is created. The site map and context navigation links must be updated by hand and standards enforced in an adhoc manner.
Content Consistency	Segregation of templates are effected from page content, strictly maintaining consistency throughout the site. Display consistency is enforced by the CMS.	Content and template are inextricably tied together, making it difficult to update changes site-wide. Display consistency is determined by the developers.
Workflow Processes	The Workflows are made simple with an built in mirror designated business processes. CMS workflow engine records an audit with comments on each step. Upon final approval, content is automatically published online.	Workflow is typically done via e-mail in an ad-hoc fashion. E-mails are sent to different persons in the organization and upon subsequent approvals, manually published online.
Publishing Times	Content is published immediately once necessary approvals have been made.	Content is published when the webmaster has available time, which could take several days and incur reconfiguration errors.
Legal Compliance	Compliance is enforced by the system maintaining records of content changes and content publication.	Compliance is left up to the team members. Changes to the content must be manually backed up and a log kept of when content was published.

Naazi & Nisha (2005) mention that, "there is no doubt about the utility of digital libraries as they facilitate live and interactive access to wide variety of contents online. But the problems of managing digital library contents and their development are manifold. Here, content management proves its importance in managing and present digital information for the users effectively".

However, Harris (2008) states that, "with increasing levels of interactivity and social connectedness in the commercial web, library sites need to become just as much of an engaging experience for users. A content management system provides a set of tools that allow libraries to remain focused on the end result of patron happiness. CMS allows libraries to skip the initial time involved in developing and creating programming script, and dive directly into content to provide a more receptive online environment for patrons". Content management systems (CMS) help libraries accomplish to these tasks on the web by providing a back-end structure for a web site so that the authors can focus on the content.

Choosing a content management system

It is observed that, Content Management System or CMS is the system that approaches the problem of content management by using markup, metadata, and tools to break documents into component parts, to a level of granularity, for example, the paragraph level, sentence level and the word level, set by organizationally defined information models, and labeling each part with metadata that describe its meaning and relationships to other content are the essential tasks to be performed meticulously.

Generally, the selection of a CMS for a library depends on the level of technical knowledge the librarians and their staff possess but initially as a trial a pilot project may be carries out for evaluating CMS and then the best one which suits to a library may be purchased or used as open source as the case may be. However, Powell and Gill (2003) have given following recommendations for avoiding potential problems while going for a CMS:

- *Get buy–in – from the top* - Make sure that the higher authorities participated in the decision and are visibly supporting your process.
- *Communicate, communicate and communicate* - Make sure that as many voices as possible engage in your deliberation. Do not forget about the people who will be doing the work, e.g., program assistant, departmental web managers etc.
- *Know where you are going* – Spend sometime in defining how your site will change under a CMS and how those changes will be implemented. Will graphical changes redesign will take place at the same time or will the site be ported as is? Further you have to outsource implementation of the CMS or use in-house staff. Moreover, your processes require new staff to support the site? Just try to think through as many issues as possible before making software decisions.
- *Avoid scope creep* – Make sure that you have defined the scope of your process as fully as possible. Also sure that both you and your consultant are clear on the limitations of the project especially, when you are working with an implementation consultant.
- *Partner with vendors who will be there in future* – The dot-com bust has taught us all that the technology industry is volatile if nothing else. So, partner just with someone you trust will be there tomorrow.
- *Do not forget other types of contents* – Consider in advance how your CMS will be involved in accommodating those

request for which users were requesting locations for content dedicated to internal and specific external audiences, even before you finish the implementation of Internet site. Also thing about other types of content, like e-mail messages, electronic and printed documents, multimedia productions and collaboration results, like instant messaging text, whiteboard text and video-conferencing session etc. and whether these need to be factored into your plans for a CMS.

- *Plan in advance to evaluate your results* – Make sure does the bottom line work? Is your navigation structure more intuitive? Does your new graphic design appeal to your target audience? Have you reduced your support cost? Have you achieved the outcomes you defined your CMS?
- *Know your audience* – Be sure that your intended audiences and the relative priority you will give each one. Decision about graphic design, architecture, navigation and other issues inevitable involve making compromises and choosing among alternatives. Thus, knowing your audiences can make those choices easier and more justifiable.

We know in case of digital libraries, the contents are organized and managed for the purpose of immediate access to the target audience. Gilbane (2000) candidly remarks that, "the explosion of web pages have been a gold mine for document management vendors as businesses became overwhelmed in case of Library & Information Centres (LICs). There they were with most of the functionality already in place and installed customer bases. Some of them even had early support for link management, page caching, and packages of templates and subscription services for what have come to be known as corporate portals. Unfortunately, few customers cared. Documents and technology for working with them were considered irrelevant or uninteresting at best, by web developers. There remains however, a lot of commonality in the requirements of the two types of systems. And there are a lot of features in document management systems that should be more prevalent in content management offerings. Some document management vendors have successfully morphed into content management vendors, and some content management vendors can now do more than assemble web pages"

There are also emerging Web Content Management System which often termed as web CMS. These are the bundled or stand-alone applications to create, manage, store and deploy contents on web pages. Web contents include text and embedded graphics, photos, video, audio, and code, e.g., for applications, that displays content or interacts with the user. For managing online information on the web, there are available many CMS, but their selection needs some attention. Web CMS has everything from the back-end text and display handler of a blog to full-site creation and management tools like Drupal to the enormous applications that back user-customizable portal sites like Yahoo.

Drupal is a free ware that can be used for content management. It contains basic features of most of the content management systems that include the ability to register and maintain individual user accounts, administration menus, RSS-feeds, customizable layout, flexible account privileges, logging, a blogging system, an Internet forum, etc. *Joomla* is another free / open source content management system for publishing content on the World Wide Web. *Plone* is also a free and open source content management system built on top of the Zope application server (Patel, 2009). However, you may also consider Contribute, a new application from Macromedia that is a client-based utility which allows web managers to build templates for web content creators and structure content to control design, security and other basic issues without requiring a full-fledged CMS. So the new comers with low budget can try this for their content management.

Conclusion

There is no doubt about the utility of digital libraries as they facilitate live and interactive access to wide variety of content online (Jeevan, 2002). But it is seen - content management systems offer a variety of modules and serve different purposes for different requirements. Concluding the paper, it can be said that though the content management is an emerging concept for libraries and information centres but the libraries have to review the types of content being handled in therein and what web-based content services the libraries would like to provide their users through the content management system and what are the future plans of libraries for introducing new services for the users.

Commercially available content management systems may be used to handle online contents. However, small libraries or those which cannot afford commercial ones, may go for freely/open source CMS for handling online digital contents for better services.

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