WCM SYSTEMS AS SUPPORT TO INTELLECTUAL CAPITAL MANAGEMENT

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Abstract:
In the contemporary business conditions, organisations definitely recognise that information and knowledge management is an inevitable process that can provide increase in productivity and business risk mitigation. In this context, the past decade has seen the emergence of Enterprise Content Management (ECM) as an integrating concept, referred to in the literature as an umbrella for various technologies integrating with the basic goal of enhancing information creation, management and dissemination through the organisation. As one of the ECM integrating technologies, Web Content Management (WCM) is addressed in this article in more detail from the standpoint of functionality. In addition to the basic characteristics of WCM, a special emphasis is placed on analysing the key concepts directly in the function of an organisation's explicit knowledge management.

Keywords: knowledge management, web content management systems.

1. INTRODUCTION

Organisations using various systems for storing unstructured contents, whether network hard drives, web sites, individual disks or desktop applications, are faced with inefficiency in their working environment. Storing data in several systems results in high content redundancy levels, which makes repeated and yet efficient use of contents for various purposes very difficult, even impossible in certain cases. Furthermore, inefficient content management results in the inability to share the content not only through the organisation, but also with customers and other external stakeholders. In addition, content residing in disparate locations is highly likely not to be updated in an appropriate and timely manner, and consequently become inaccurate and out of date. Such omissions may result in poor business decisions, which is, at the very least, a risky proposition. According to research conducted by LexisNexis Workplace Productivity Survey in 2007 (Rivet Logic, 2008), 68 % of the workforce believe that the inability to access information when they need it prevents staff from being efficient and productive.

Effective content management should provide higher value of the content for all its users. The key to resolving inadequate value can be, to a significant extent, sought in the timely delivery of relevant data, with appropriate data integration forms. A content management system should be focussed on its essential functionality, i.e. to deliver each item of key information to relevant stakeholders on time, in an appropriate format, as an individual activity of the whole process, and thereby eliminate the above mentioned adverse effects (Đurković, Trninić, Vuković & Raković, 2010).

From the knowledge management perspective, it is essential to emphasise that ECM technology has the possibility to provide, i.e. support managing explicit knowledge (knowledge that can be formally presented, i.e. documented). According to Atos Origin (2007), the ECM system components that can be identified are:
- Document Management;
- Web Content Management;
- Workflow Management;
- Document-centric Collaboration;
- Document Imaging; and
- Records Management (Picture 1).

Picture 1: Enterprise Content Management
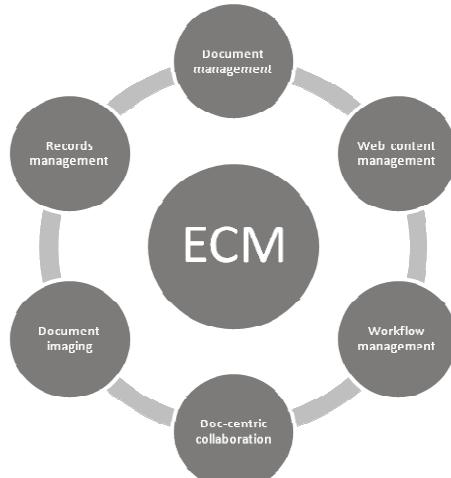
Source: Atos Origin, 2007, p. 8.

Document management – provides infrastructure for organising and managing electronic documents. This refers to: document location, document creation methods, document search, document safety, document storage time, document distribution and document routing.

Workflow management – the function of this component is to send documents and other forms of content according to pre-defined data flows, with the aim of their control and validation. More complex workflow systems support business process automation and perform activity and task tracking within business processes, with documents as an integral part thereof.

Document-centric collaboration – supports collaboration between individual teams on certain documents, and the use of these applications is of special interest to organisations comprising dislocated organisational units.

Document imaging – a technology divisible into two components, i.e. document gathering and storage. Most applications of this type are focussed on storage and management, while in the data gathering activity they leave the possibility of integrating with certain applications firmly established in this area. However, there are applications with both components integrated.

Records management – enables keeping records within the organisation of all changes in the document lifecycle, from document creation to archiving. The information, i.e. records may come from various sources, such as e-mail, web pages, scanned documents etc.

2. WCM SYSTEMS

WCM systems provide functionalities for the creation, management, distribution, publishing, and discovery of information within an organisation. They cover the entire lifecycle of the organisation's web site or portal pages, by providing simple mechanisms for content creation, publication and archiving. The greatest advantage of these systems is that the content can be published in several locations (such as web sites, portals or mobile phones), owing to its flexibility enabled by XML and XSL languages.

The anatomy of WCM systems can be broken down into four basic categories:
- content creation;
- content management;
- content publication; and
- content presentation.

Each of the above categories will be briefly elaborated on below.

Content creation. Content management system interface is an easy-to-use environment, similar to that of the well-known MS Word text processor. Such interface enables simple creation of new content without the need for HTML language skills. Content management systems provide for web site structure management, which implies linking pages. In some of them, it can be performed in a very simple manner, with drag-and-drop technique. Almost all currently used content management systems provide a web-based environment, enabling entering content regardless of the location of the employees in the organisation. It is such a type of environment that represents a key success factor and leads to a growth in the number of applications of these systems in organisations.

Content management. Once the content has been created, it is stored in the content management system database. This database holds the entire content of the site, i.e. portal, including all other details pertaining to the content (creation date, author's name etc), enabling content management systems to:
- keep track of all the versions of the content, as well as who changed what and when;
- ensure that each user can only change the segment of the portal they are responsible for;
- integrate with the existing information resources.

The most important features provided by content management systems are the definition and implementation of workflow rules. The manner in which these rules function is described on a specific example below.

Once a given content has been created by the author, it is automatically forwarded to a higher-ranking manager for approval, and then, for instance, to the central web team for review, after which it is published on the organisation's portal. At every stage, the CM system records the content's status, reminding those responsible the content about their obligations within the lifecycle of this content. Thus, the implementation of workflow rules in fact allows for several authors to be involved in portal management, while maintaining control over the quality, accuracy and consistency of the content.

Content publication. When the final content is placed in the content management system database, it can be published on the organisation's web site or intranet portal. Content management systems have fast content publication mechanisms, meaning that the content can be displayed in various ways, via templates, on several different web locations.

Content presentation. Content management systems provide numerous features for enhancing the quality and effectives of the sites themselves, or portals. They are dynamic and interactive, and provide various levels of access for the users. In addition to the above, a content management system can automatically create navigation on the portal, directly, based on the structure of the content in the database (Robertson, 2003a).

Picture 2: Content management system anatomy
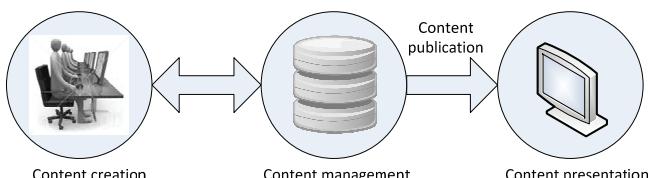
Source: Robertson, 2003a.

3. THE BUSINESS IMPLICATIONS OF CONTENT MANAGEMENT SYSTEMS

A large number of organisations nowadays recognise that content management systems are indispensable for the maintenance of large sites, i.e. organisation portals. In addition to maintenance efficiency that they *de facto* provide, it is also important to ensure that content management systems should meet criteria for business objectives specific for each individual organisation. Without a clear vision of business goals that a system is to support, it is impossible to track the project performance, or ensure the maximum benefits provided by the

system. The following section of this article will elaborate on some of the business objectives that content management systems can support or accomplish in full.

Increasing site or portal flexibility. Organisations' portals must be adaptable, so that they can underpin the organisation's new products, services or strategies. In this context, content management systems provide simple interface restructuring and redesign, including updating portal pages with the organisation's new products, services and general information.

Increasing information accuracy. The quality of information on a site and intranet portal can only be provided if the information is accurate, up-to-date and comprehensive.
Support to marketing. Web sites have become a key and inevitable component in marketing. Content management systems enable the distribution of marketing materials, and support to the organisation's current products and identity.

Reducing information redundancy. Information redundancy in an organisation's business units increases system maintenance costs and may result in various errors in business operations. Whenever possible, information should be stored in a single place and used as required.

Improving the customer's user experience. Content management systems provide a functionality-rich and, at the same time, easy-to use environment for the organisation's web site visitors.

Modernising information update. Manual information update process on the web site is slow and inefficient. Content management systems provide a different, decentralised web site information update method.

Capturing knowledge within an organisation. Content management systems provide a perfect way for gathering and documenting knowledge possessed by the organisation's employees.

Improving knowledge sharing. Direct staff communication and information sharing within content management systems are two highly effective knowledge dissemination methods across the organisation.

Supporting knowledge discovery. The organisation's employees are faced with a huge amount of information on the organisation's portal. Content management systems provide search and filtering tools enabling the staff to reach the key information.

Improving staff efficiency. Staff efficiency can be increased if sufficient information is provided for key business processes. Content management systems must provide the employees with the required information in a timely manner. A direct benefit is saving the staff time, and a side-effect is a decrease in the number of searches for required information.

Reducing web site maintenance costs. Implementing content management systems directly eliminates the need for standard activities in the classical, highly labour-intensive maintenance, especially of large web sites, resulting in the reduction of staff in charge of maintenance activities (Robertson, 2002).

As it can be seen from the above, the business implications of implementing content management systems are numerous. It is essential to emphasise that, when introducing

content management systems, it is necessary to previously define the business objectives to be achieved. If we take an example of an organisation from the retail business that wants to use a content management system to manage its own sight for business purposes, it should take into consideration customer support cost reduction, data redundancy reduction, increase in site flexibility, customers' user experience improvement, and other business activities. On the other hand, an organisation that wants to implement a content management system primarily for setting up an internet portal for business purposes should be focussed on: improving staff efficiency, reduction in data redundancy, knowledge gathering inside the organisation, support to knowledge discovery, and improvements in knowledge sharing.

4. KNOWLEDGE MANAGEMENT IN WEB CONTENT MANAGEMENT SYSTEMS

The following section of this article will give a more detailed explanation of content management systems in the process of capturing organisational knowledge, as well as the role of these systems in a broader organisational knowledge management strategy.

In the above context, it is essential to highlight that knowledge does not represent the content itself. On the contrary; knowledge resides in the business processes and practices surrounding the content management system. Recognising the appropriate activities in business processes and practices and parallel implementation of a content management system can result in great benefits in the area of organisational knowledge management.

Capturing knowledge in WCM systems. Content management systems are of great value in the knowledge capturing process in an organisation. Some of the practical methods in content management systems that can be used for the purpose of organisational knowledge management will be explained below.

Content restructuring and rewriting. A large amount of information is accumulated in an organisation over a long time period, without a definite framework or strategy for managing this information. This results in generating a huge amount of content, mostly one that is not up-to-date by the criteria of timeliness and accuracy; in other words, this content is poorly structured. Restructuring and rewriting the accumulated content directly contributes to the increase in the value of organisational knowledge as an asset. It is especially important to engage well-trained expert staff for such tasks, for their role in this decisive for obtaining key information in a more effective form. Within this process, it is possible to identify gaps in the organisational knowledge and provide mechanisms for filling them in. Also, the process of content analysis can result in identifying which new knowledge the organisation requires. Recognition and choice of the body of required new knowledge is only possible if people involved in this type of analysis invest a significant amount of effort and time, but on the other hand, it is also necessary for the organisation to provide adequate support for the completion of this process. At any rate, this is not, or should not be, a hastily completed and cheap process, as its ultimate goal is the complex activity of capturing the organisation's key knowledge. Creating high-quality content is the best avenue for creating knowledge resources within an organisation, and it is for this reason that adequate financial and human resources must be secured when planning intranet projects.

Human resources who should complete the content rewriting activities are selected from among experts in key areas. These are, first of all, employees in the organisation possessing implicit knowledge of the key business processes and products. They should be the corrective

factor, i.e. content completion and correction resource, and provide guidelines on the key topic to be elaborated, and then entered into the content management systems. In many organisations, staff members possessing the most knowledge in certain areas are, in most cases, nearing the end of their career, i.e. retirement age. Content management systems provide a suitable platform for gathering information and knowledge from these experts, which will subsequently remain available to current and future staff, thus providing quality and consistency in the functioning of the organisation's business processes and practices. In addition, these systems are highly efficient in providing content flow mechanisms across various organisational segments.

Identifying content owners. To ensure that the content remains up-to-date, content owners, i.e. authors must be identified for each piece of information stored in the content management system. Although this may seem as a common practical requirement for providing information quality, there are obvious organisational knowledge management implications. In what manner? Fundamentally, identifying content owners by particular mechanisms result in the formation of a knowledge map within an organisation, showing which individuals possess particular items of knowledge. These insights can be used as support to other activities pertaining to knowledge within the organisation. Publishing a list of content authors with their contact details on the intranet portals opens the possibility for other staff to contact them directly, thus contributing to knowledge sharing across the organisation and enhanced communication.

Metadata. Content management systems simplify creating and manipulating metadata (data about data). Metadata can contribute to knowledge management in an organisation in various ways:
- enabling the identification of content owners, as described above;
- linking various contents within the system (related pages);
- gathering information for content classification, such as key words.

Workflow. Workflow rules are used in content management systems for automating the content control and validation processes, thus securing a better content quality control and increased content management levels on a portal. Defining appropriate workflow rules represents a certain form of process mapping. Effective workflow rules match the existing information flows through the organisation and become compliant with business processes. In other words, in order to define workflows properly, it is necessary to first understand how the organisation currently functions.

Content management system usability. Providing an easy-to-use interface for entering new contents, content management systems can remove numerous the barriers to disseminating information across the organisation. The basis for this approach is the possibility of decentralised entry, implying that users can create and update their own content independently. A good content management system eliminates the need for HTML knowledge and other programming skills, as stated above. Instead, a simple WYSIWYG (what-you-see-is-what-you-get) editor is, in fact, interface for content production. In this way, if an appropriate decision is made at the organisation level, content writing can become part of the staff's regular workload. In this way, for instance, a project team could provide daily updates on the progress of current projects; top managers could document and publicise the organisation's strategic decisions; engineers could publish solutions to specific technical issues etc. The above described, and many other ways offering the possibility to publish

information quickly and easily on a platform accessible to the entire organisation, undoubtedly contribute to achieving the key knowledge dissemination goals.

Measuring parameters. The primary purpose of measuring certain parameters in a content management system, such as usage statistics or search engine logs, is to establish the success of implementing the content management system in the organisation. However, the measurement results can also reveal valuable information about the latent needs of the staff in the organisation. A practical example could be represented through parameters in search engine logs, which can precisely show which terminology was most used in searches, as an indicator of the latent needs of the organisation's staff (Robertson, 2003b).

5. INSTEAD OF A CONCLUSION: KNOWLEDGE MANAGEMENT PORTALS OF THE FACULTY OF ECONOMIC SUBOTICA

In order to have a well-completed article, the authors deemed it appropriate to apply the above described theoretical concept on a practical example of a knowledge-based organisation, where knowledge is the capital asset. In view of this fact, the Faculty of Economics Subotica has developed a portal in Joomla 1.5.22 content management system, whose functionalities are primarily focused on achieving the business goals of capturing, enhancing dissemination, and underpinning knowledge discovery at the Faculty.

The key functionalities of the portal - such as content authoring, updating, supervision and review are available only to registered users, employed at the Faculty. The idea is based on the concept that researchers enter their own scientific papers, and the sources used in their research, into the content management system and thus, over time, form a considerable knowledge base for future research. When entering the content into the system, the key feature is defining metadata for each individual content item, which will later enable presenting linked contents on the portal. The content is organised in department sections, defining different categories for specific scientific disciplines. The Joomla WCM system registers the authors of each item of content entered into the system, which can be very useful for later identification of the content owner, and, possibly, establishing contact with the content owner. The portal also comprises a forum through which the faculty and staff members can exchange messages on subjects they can define themselves on the forum, a base of useful external web links, links to video clips presenting different courses in specific areas or disciplines, and, of course, a module for searching the entire portal database.

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