The What and Why of Content Management

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1. A Short "Content" Glossary

The broadest possible definition (and the one used by most web-meisters and content managers) includes just about any digital representation of information--text, graphics, pictures, data, source code, HTML pages, XML pages, etc.--typically anything that is just shy of being a formal "document." Documents include books, reports, papers, records, contracts, applications, claim forms, invoices, etc. If they are electronically "managed" at all, it is usually in a manner quite different from content management. *Content management*, in a nutshell, is an electronic *publishing* process; it is about eliminating online publishing bottlenecks and optimizing the reuse of media. Content management has very little to do with determining the quality or efficacy of a piece of media or the information presented.

GartnerGroup explains that "content management is an ambiguous phrase with meanings that vary depending on what a user may need or a vendor may offer" ([Gartner Group, 2000](#)). Content management, simply stated, is the process of sharing information vital to an organization. Likewise, intranet content management involves sharing information using the private computer networks and associated software of intranets (or extranets) as a primary communication tool. In today's "information society," where the total quantity of data and the pace of communication continue to increase, the goal of effective content management continues to gain importance.

In one sense, content management processes existed well before intranets or computer technology were developed. Interesting pieces of information were methodically shared within organizations through -- among other things -- memorandums, ledger books, or telegrams. As computers proliferated, "document management" processes were developed to control versioning and access to electronic documents specifically. In the computer industry today, however, the term "content management" refers to computer-based data management generally and in particular to content models centered on Web publishing and Web technology standards.

One modern form of content management system takes a Webmaster-centered approach. This approach dedicates the time of appointed individuals to the task of manually reviewing, sometimes re-formatting (typically in HTML), and releasing content and supporting software to a Web site. This approach may be satisfactory for some intranets, but in general, the expectations and technology of intranets have evolved in recent years to an extent that makes this approach much less appealing.

2. Why is Content Management Important?

According to [IDC](#), knowledge workers spend up to 50 percent of their time looking for information, leaving them with only 50 percent to make use of this information. In the current economic climate, companies are requiring everyone to do more with less; reducing the time it takes for workers to gain access to answers is now even more mission-critical. But content management, as it currently manifests itself, doesn't help this problem one bit, because its focus is typically only on getting more information in front of people, and not necessarily the right information ([Bell, 2001](#)).

Content is much more than data or information; it is knowledge that has been codified (i.e., an investment has been made to make it explicit) so that it can be more easily distributed and reused for a specific business purpose by a targeted audience. It can take many forms, including all of those mentioned above, and the investment may be large or small, but it's not worth much unless

people are actively doing something with it in the pursuit of one or more business objectives (whereas many documents are just maintained for historical, audit or regulatory purposes).

Most businesses need to be good at both content management and knowledge management. Most businesses probably already have some content management going on--for their external website, intranet, etc.--but aren't doing any formal knowledge management. In fact most of the content being managed is either for external use--i.e., for customers--or is for general internal consumption. In either case the content is typically not linked directly to the execution of a business process, except maybe in the case of online product catalogs. But once you commit to doing real knowledge management--delivering content that has a direct impact on the execution of all of your key business processes--don't let the content managers continue to dictate the rules of engagement for the functions that are involved in both processes, because KM is now the higher order business process, even though content is the output of that process and is at the top of the knowledge food chain.
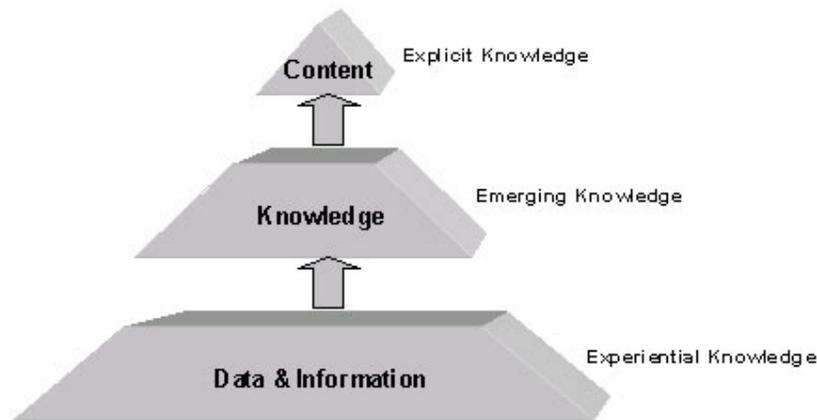

Fig. 1 The knowledge "food chain"

Institutions have no shortage of 'content' - be it data, information or knowledge. When the creation and publication of content is well managed then the organisation functions more cost-effectively; it is also likely to lead to better decision making.

Process/Benefit	Prospectus example
Engendering the re-use of information by allowing the ready integration of data from diverse sources.	A Web prospectus page describing a programme might draw together information from such sources as the student record system (for curriculum data), the personnel system (for details of teaching staff) and an imagebank (containing attractive pictures).
Permitting the efficient re-purposing of information.	The same prospectus page might be rendered a PDF (for high quality hard-copy), as plain text (to be sent as an e-mail message) or optimised on screen for a partially-sighted user.
Allowing information maintenance to become devolved but at the same time preserving central control.	The prospectus entry can be devolved to its academic director but, before going live on a pre-assigned date, a member of the marketing department would first check the amended text for factual and stylistic consistency.
Ensuring presentational consistency by separating the design of Web pages from the content they display.	The academic director would be provided with a template to enter the information about the programme ….

De-skilling the task of putting information on the Web.	…. which reduces the task to no more than 'filling in the boxes' on a Web form or a word-processor document.
Facilitating good information management practice so that appropriate metadata are captured at the time of content creation or modification.	The relevant prospectus page is 'stamped' with the name of the maintainer, the creation or modification date, an expiry date (which would later cause the automatic generation of e-mails to the maintainer of the information at regular intervals before this date) and incorporation of keywords to ensure indexing by search engines.
Permitting some past state of the Web site to be re-created or restored.	The edition of the prospectus from two years ago can be re-constructed.

Table 1. The Business Benefits of Content Management (Browning and Lowndes, 2001)

3. CMS – The Soul in the Machine

Managing a web site with hundreds or thousands of pages and multiple authors is a challenging task, especially when most sites are handcrafted by your webmasters. The lack of a content management solution to handle all this content can leave your web site unorganized, unattended and unproductive, all of which can lead to a loss of revenue opportunities. Web Content Management System (CMS) tools address this problem by providing a way to manage, organize and automate your entire content management process from content creation to content delivery on multiple channels and devices to meet the needs for high-quality, fresh and relevant content from all intended target groups such as customers, employees and business partners. You need a content management system when this process becomes too complex to manage manually.

The boundaries of the CMS space are fuzzy. Substantial overlaps exist with document management systems, knowledge management systems, enterprise application integration systems, e-commerce systems and portals (Browning and Lowndes, 2001). There are also significant (but as yet not generally recognised) overlaps with intranet groupware and virtual learning environments. Indeed, it may turn out that one institution's 'managed learning environment' is another's CMS. A CMS is not really a product or a technology. It is a catch-all term that covers a wide set of processes that will underpin the 'Next Generation' large-scale web site.

A content management system must manage the relationships of the information objects it contains. There are two ways to relate information objects: linking and naming. Linking creates a specific connection between two (or more) specific information objects. Naming clarifies the names of things referred to in one information object in such a way that it is possible at a later time to create a link to many different objects. Picking content management technology that supports a strategic methodology will determine the success of the intranet not only from a content standpoint, but also usability and long-term return on the investment (Barnes, 2002). Open architecture, extreme ease-of-use for non-technical content contributors, workflow, and personalization capabilities should all top the list of criteria when evaluating content management solutions in addition to cost. In the long run, customization that includes lots of programming and development can cost much more than taking the time to find a solution that supports customization out of the box.

Successful e-business initiatives demonstrate end-to-end planning. An end-to-end Content Management capability involves everything from the back-end content repositories to the presentation of that content within a Web browser. Across the enterprise, this means addressing the demands for capture, creation and management of multiple data types, streamlined editorial/approval processes, publishing processes to multiple distribution channels, and total document life-cycle management. End-to-end also means integrating processes between functions within the business and then extending processes beyond the corporate firewall to vendors,

partners, and customers. On the supply side, Content Management is a vital component for mission-critical eBusiness initiatives such as Enterprise Resource Planning, Supply Chain Management, and B2B commerce activities. With end-to-end Content Management capabilities, businesses can integrate with their vendors and suppliers. This leads to automating transactions and better managing the resources involved in buying, making, and moving products and services. On the service side, Content Management is a vital component of Customer Relationship Management (CRM). As CRM becomes a mission-critical initiative shared across the different functions of Sales, Marketing, and Customer Service, the content and processes that drive transactions and manage the customer relationship need to integrate across those functions. With end-to-end Content Management capabilities, businesses can integrate the different functions that touch the customer and better manage each and every customer relationship, from acquisition to ongoing service.

4. How Does It Work?

There are three approaches to content management (Arnold, 2002). Firstly, there is configuration management. This discipline focuses on software code. The idea is that the code for a web site is kept in one location. When changes are required, an authorised user makes changes, and then checks in the new version by going through a mandatory set of steps before the new software goes live. This is a comprehensive technical discipline with a trade association, directories of software experts, and technical nooks and crannies. Leaders in the field, such as Rational Software, combine rigorous work flow tools with specialised functions to prevent a zealous programmer from overwriting the source code for a critical program.

A second category of content management software provides the tools that help a web master keep a web site updated. For many individuals and some organisations, programs such as Microsoft's Front Page, and alternatives from Ektron and Net Objects Fusion provide basic, useful services. Documents can be created and updated. Changes can be made to dynamic pages and various types of interactive functions can be added to a web site with modest or in some cases no programming. The costs for these web-centric content management tools range from shareware with fees in the $A75 range to more than $A10,000 for an entry level Ektron package. As powerful as these packages are, most lack what are called 'work flow' tools, which implement business rules that ensure each document moves through a specific process prior to publishing.

The third category of content management focuses on how work gets done. In small organisations, the proprietor does all the jobs. In large enterprises, hundreds of people can be involved in a single document's life cycle. The idea behind enterprise content management is to control access to and reuse of content, whether by sales, customer services, public relations, or anybody else -- for web, extranet or mobile devices.

One of the key virtues of using a content management system is to give one control over how information is linked, organized and delivered, forming relationships based on names rather than links is a useful way of gaining greater control over one's content and increasing the range of uses one can make of it. For purposes of naming objects referred to in content we require a naming scheme that:

- adequately identifies the named object for purposes of the processing to be performed to generates links, and

- allows authors or editors to identify objects using a name they know or can easily access.

Content management systems must manage information relationships that occur both in tabular data and descriptive text (Baker, 2002). They typically do this by subsuming descriptive material into the tabular structure while maintaining full access to the relationships present in the descriptive text. To do this, a system can use XML to mark up a piece of text to indicate:

- That it is a name or a reference to an object (a real world object, or an information object).

- What kind of object it is (what namespace it belongs to).

- The controlled form of the name being used in the namespace.

5. Choosing the Right System for the Right Content

In order to understand what best-of-breed approach is right for you, start by defining your specific requirements. To assist in defining requirements, they identified different segments along the consideration path:

- Enterprise Internal Content Management: the process for integrating digitized data of multiple types, in multiple formats and from multiple sources, so that users can access a cohesive set of relevant information about a topic. This includes information internal to the business as well as information the business needs to drive external activities.

- Web Site Content Management: the creation, organization, delivery, and maintenance of non-transactional Web site-oriented content.

- eBusiness Transactional Content Management: The content relevant to a B2B or B2C customer transaction along with the set of business rules used to process the transaction.

- Shared Content Management: the processes that allow shared information to be managed and accessed jointly. This involves the management of the document life cycle along with robust search capabilities (Gartner Group, 2000).

Jason Meugniot, managing director and CMS Practice Leader advises that before one can successfully evaluate CMS products, you need to carefully and equally consider technical requirements that address critical business problems, content management and distribution needs, integration with existing systems, and support infrastructures (Choo, 2002). A host of technical requirements should be looked at, including:

- Specific content management and delivery functions.

- Content migration, which is often the most overlooked requirement.

- Existing systems and platforms.

- Internal skill sets and existing technology investments.

- Scalability, especially for Internet sites with traditionally high or seasonal traffic.

- Security of intellectual property or content, which are often a company's primary assets.

- Reusability, because once a site is launched, new requirements and modifications are predictably right around the corner for even the most well-planned solutions.

- Expandability, since content management applications are generally one of many in an overall architecture. They should allow integration of third-party applications and adhere to industry standards.

- All third-party systems that require architecture integration.

- Protocols and integration methods (such as Web Services).

- Reliability, especially if you are considering a reduction in your technical-support capability.

- Autonomy, as content management functions (such as content entry) should operate independently of your Web delivery functions (such as serving Web requests).

- Bandwidth and user load, as they provide context for sizing and capacity planning.

- Performance requirements that can help a CIO measure the success of an implementation, especially when other quantifiable metrics do not apply (such as product sales volumes or subscription growth).

Today a number of vendors offer software implementations of content management systems that attempt to alleviate "Webmaster bottleneck" by automating menial tasks and otherwise distributing workload (Ort, 2000). Such products include most or all of the following key features:

- Web-based publishing. Documents and other forms of information can be disseminated by authorized individuals. Page templates, wizards, and other software aids help inexperienced content authors to produce higher-quality output. Data useful on intranet, extranet, and ecommerce Internet sites, for example, can automatically be re-purposed and co-ordinated for the multiple destinations.

- Format management. Data can automatically be converted into formats suitable for Web publishing such as HTML or PDF. Legacy electronic documents, or even scanned paper documents, can be unified into a few common formats that are more easily shared with third parties.

- Revision control. Files can be updated to a newer version or restored to a previous version. Changes to files can be traced to individuals for security purposes.

- Indexing, search, and retrieval. For data to be valuable, it must be relevant to the task at hand and accessible in a timely fashion. Documents can be parsed for keywords, headings, graphics, and other elements; mechanisms for processing search requests become critical.
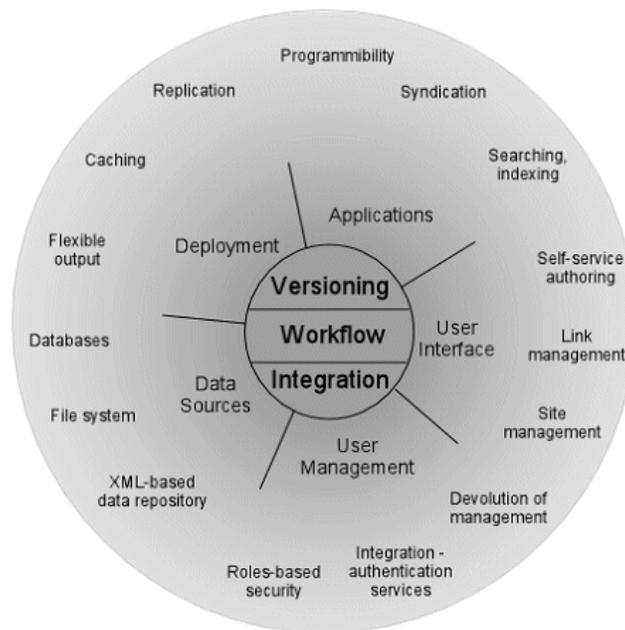

Fig.2 CMS Features

More generally, effective content management systems support an organization's business processes for acquiring, filtering, organizing, and controlling access to information. Because no two organizations use identical business processes, content management systems in practice can be compared to snowflakes -- no two such systems will look or behave exactly alike!

6. It's Not All Rosy Gardens:

Buying a web CMS is a major decision, requiring significant investment from your organization. The wrong decision can seriously reduce your organization's adaptability to the fast-changing challenges of e-business. The need for a content management system can be gauged by the amount of change in the content you have and the number of publications you intend to create. While a content management framework can help you with even your smallest projects, you may not see enough cost savings to justify the effort involved in constructing a solid content management system until you have a larger system. It is essential early on in the process to not only investigate

the functional need for content management but to clearly define the revenue enhancements that CMS will provide. It is impossible to gain management support for a significant capital investment for a business case based on expense reduction alone (Choo, 2001). One of the greatest challenges to any content management system revolves around the process of justifying a significant financial investment required to buy and integrate the technology (Freeman, 2001).

Gartner Group, for example, recently reiterated its prediction that half the CM vendors in existence in mid-2001 would leave the marketplace by the end of 2002. Analysts consistently advise prospective CM buyers to tread carefully because their vendor may not stick around. Walker (2001) says that "most of today's content management systems simply don't work the way they should". According to Forrester Research (Dalton et al. 2001), which in 2001 examined a dozen commercial CMSs, including well-known solutions from Vignette, Broadvision, nCompass and Interwoven, the winner software (Open Market Content Server) scored 3.0 out of 5. The report warned that organisations that have bought CMSs are going to run into problems maintaining and customising them - and that they are likely to discover nasty mismatches between their CMS and other software, such as application servers and outside systems. "Owner satisfaction will be short-lived", Forrester concluded bitingly. The report estimated that putting place a "basic content management system" will cost a company over $A1 million and a fancy solution will cost much more (Honeywell got a discount on Merant, who sold them the software for $A250,000 with strings attached – only 10 users can contribute to it at any one time).

7. Conclusion:

Numerous factors determine the degree of difficulty an organization will face in deploying or improving their content management systems. An organization's size (number of employees) and geographic dispersion (particulary across national or cultural boundaries) can give a first-order estimate. Another factor to consider is the diversity in forms of electronic data held within the organization. Besides plain text documents, critical data can also exist in alternate forms such as graphics, audio/video, and engineering diagrams that can prove much more difficult to manage. Finally, some organizations may historically have relied on an "oral tradition" of predominately verbal, undocumented communications, leaving little data readily available to collect.

e-business initiatives promise great opportunities for operations of all sizes throughout different industries. Success for many will be contingent upon how well they manage their content and processes online today and create a solution that can carry the load in a future that will surely be more complex and sophisticated. In the final analysis, content management is only a means to an end. One can easily become enamored with the idea of total information sharing among all of an organization's employees and forget that this is probably not a worthwhile goal. The process of information sharing becomes valuable only when the "right data" is communicated to the "right people" at the "right time." Your content management system will probably be effective only to the extent it contributes to this goal.

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