TreeWorks

Content Management Systems

A CMS can encompass an organization's entire content creation and organization system. It provides a content repository where information can be edited independently from the web design element, and, most importantly, it can produce websites or any other publications from the stored content.

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Content

Introduction

The field of content management is relatively new. It was developed as a mechanism to address the problems facing institutions struggling to maintain their Web presence.

Plagued by out of date materials, poor control of design and navigation, a lack of authority control and a constriction of the Webmaster bottleneck, institutions have resorted to developing customized processes and tools to alleviate these problems.

The pre-millennial Web was characterized by a highly manual approach to maintenance, whereas the successful post-millennial Web relies more and more on automated maintenance. Content Management Systems (CMS) will be a major vehicle for this automation.

Generally, the term "Content Management System" is synonymous with "Web Content Management Systems", further confusing the consumer. There are no universally accepted standards or features constituting what CMS systems should contain or do. Thus, the definition of a CMS has become quite blurred when comparing various vendor solutions. Furthermore, the boundaries of the CMS system overlap considerably with document management systems, knowledge management systems, enterprise application integration systems, e-commerce systems and portals. Additionally, there is a growing recognition that these systems also share many common features with groupware products and virtual learning environments.

Definition of Content

Content is in essence any type or unit of digital information that is used to populate a page - web page or otherwise. It can be text, images, graphics, video, sound etc. In other words, anything is likely to be published across the Internet, Intranet and/or Extranet.

Content Management

Content Management contributes to the effective management of various kinds of content by combining rules, process and workflows...

…in such a way that centralized webmasters and decentralized web authors/editors can create, edit, manage and publish all the content of a web page in accordance with a given framework or requirements.

Content management is the strategy and technology of storing and indexing information from and about analog or digital media. A web content management product permits business users not only to take control of the web content, but also to achieve their business goals while doing so, by collecting, effectively managing and making information available in targeted publications.

- During collection, information is either created or acquired. It is then converted into a master format (such as XML) and segmented into discrete chunks called content components. Components are metadata containers that make it easier to organize, store and retrieve the content.
- Content is managed within a repository that consists of database records and/or files containing content components plus administrative data (i.e. the system's users).
- To make content available, the content management system publishes to targeted publications such as websites, printable documents and email newsletters.

The Content Management System

A content management system (CMS) is a system used to manage content, typically for a website.

Content management systems are sometime referred to as Web Content Management Systems (WCMS).

Generally, a CMS consists of two elements: the content management application (CMA) and the content delivery application (CDA). The CMA element allows the content manager or author (who may not know Hypertext Markup Language - HTML) to manage the creation, modification and removal of content from a website, without needing the expertise of a webmaster. The CDA element uses the information, compiling it to update the website. The features of a CMS system vary, but most include web-based publishing, format management, revision control, as well as indexing, search and retrieval.

- The web-based publishing feature allows individuals to use a template or templates approved by the organization, as well as wizards and other tools, to create or modify web content.
- The format management feature allows documents (including legacy electronic documents and scanned paper documents) to be formatted into HTML or Portable Document Format (PDF) for the website.
- The revision control feature allows content to be updated to a newer version or restored to a previous version. Revision control also tracks any changes made to files by individuals.
- A CMS system indexes all the data within an organization.
- Individuals can search for data.
- The CMS system retrieves data using keywords.

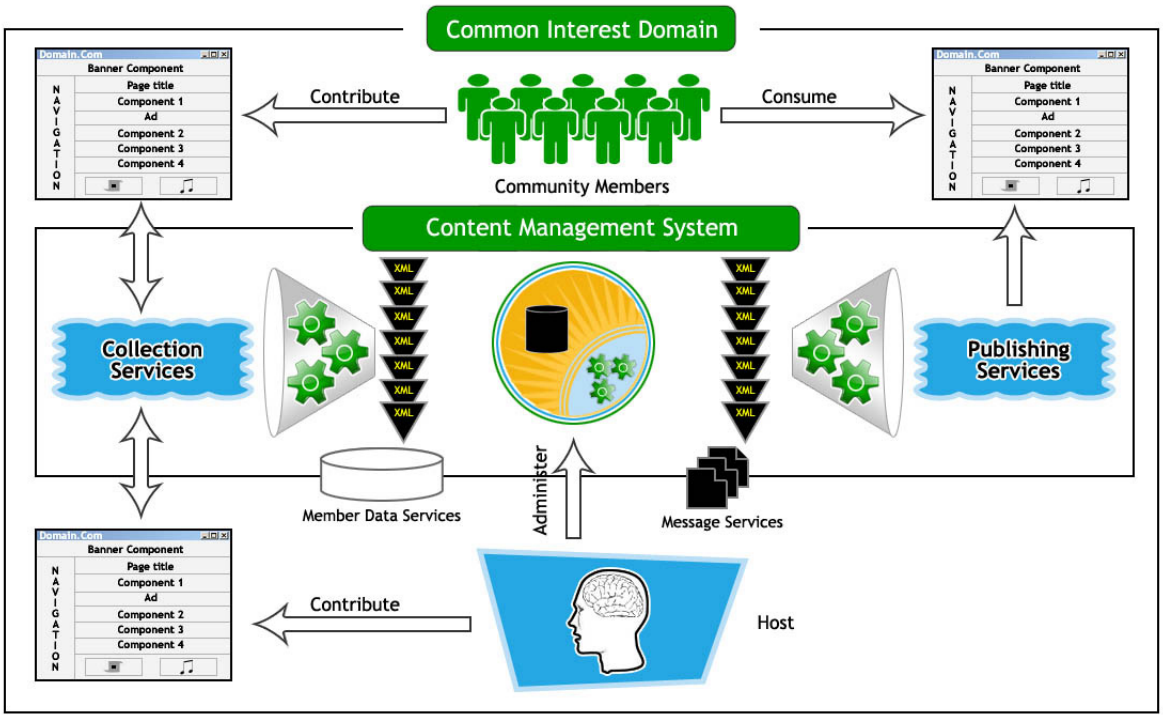

Figure 1

A CMS enables a variety of centralized technical and de-centralized non-technical staff to create, edit, manage and finally publish a variety of content (text, graphics, video etc), under the constraint of a centralized set of rules, processes and workflows that ensure a coherent, validated website appearance.

A content management system starts with a purpose and a set of target publications. From these, a set of content components is derived that serve the stated purpose and that can be combined to create any of the target publications. A metadata framework is built around these components to allow them to be created, managed, and drawn into publications by a staff whose actions are guided by a set of codified procedures called workflows.

To make the content available, the system creates publications such as websites, printed documents and email newsletters. A content management system is needed when there is too much information to collect, manage and publish by hand.

A CMS may also provide tools for one-to-one marketing, giving webmasters the ability to tailor their websites' content, and advertise to a user's specific characteristics by using information provided by the user, or gathered by the site (for example, a particular user's page sequence pattern). For example, if you visit a search engine and search for digital camera, the advertising banners will belong to businesses that sell digital cameras.

How Do Content Management Systems work?

A Content Management System can be broken down into four categories by function: Content Collection or Authoring, Workflow, Storage or Management, and Publishing.

A CMS system manages the flow of content from authoring to publishing by using a plan of workflow and by providing content storage and integration.

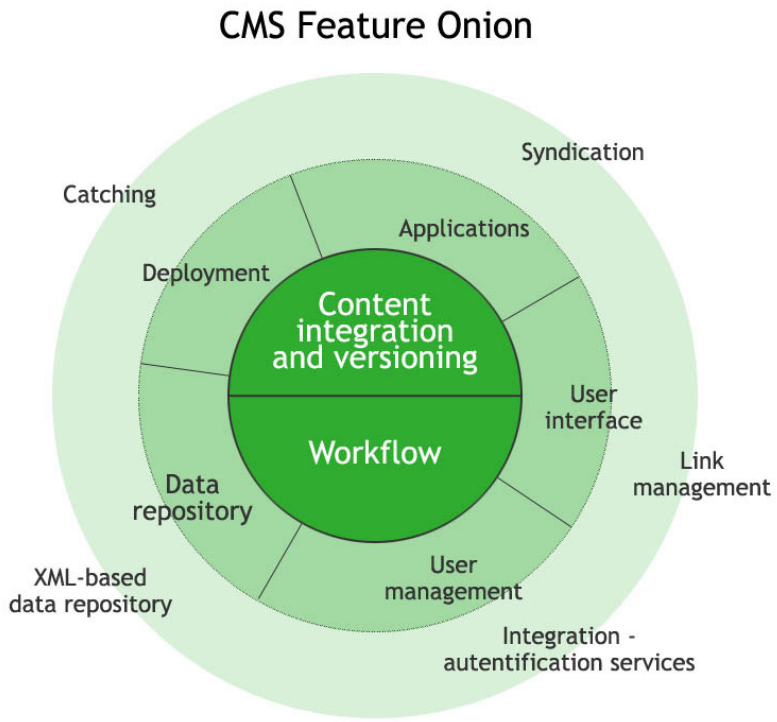

Figure 2

Collection/Authoring

The collection system includes the tools, procedures and staff that are employed to gather content, and provide editorial and metadata processing.

The content collection process consists of adding new components to the existing repository.

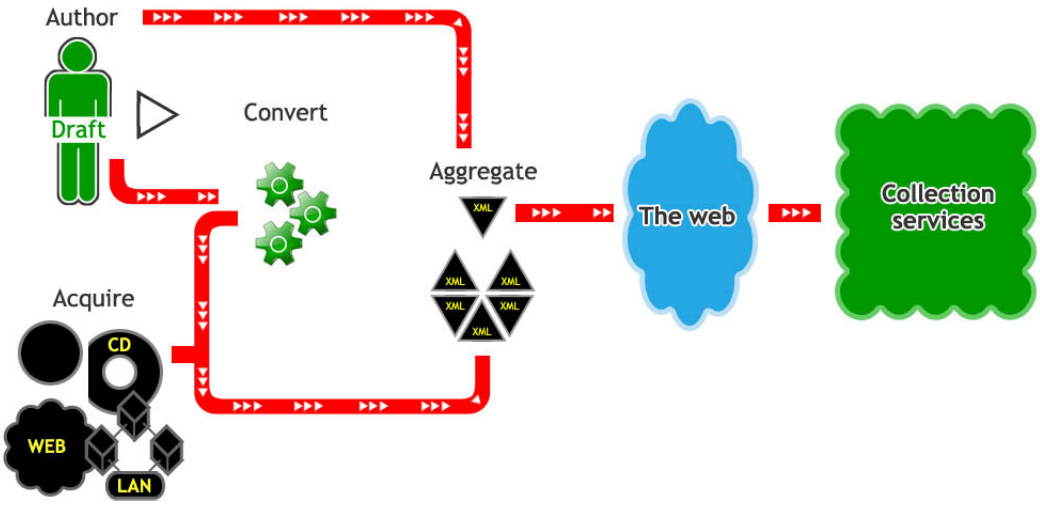

Figure 3

Content collection can be divided into these categories:

Authoring

This is the process of creating content from scratch. Authors almost always work within an editorial framework that allows them to fit their content into the structures of a target publication. Authors should also be made aware of the metadata framework that has been developed for the downstream use of the content. Authors are in the best position to tag their own creations with metadata information. So authors should be encouraged and empowered to implement the metadata framework within their content as much as possible.

Figure 4

Aggregation

This is the process of gathering pre-existing content together for inclusion in the system. Aggregation is generally a process of format conversion followed by intensive editorial processing and meta-tagging. The conversion changes the formatting of the content, while the editorial processing serves to segment and tag the content for inclusion in the repository.

Obviously, the closer the original content conforms to the standard specified in the content management system's framework - both its editorial structure (meaning its style and desegregation into a standard element structure), and its metadata structure and the meta information that has been entered -, the easier the aggregation is.

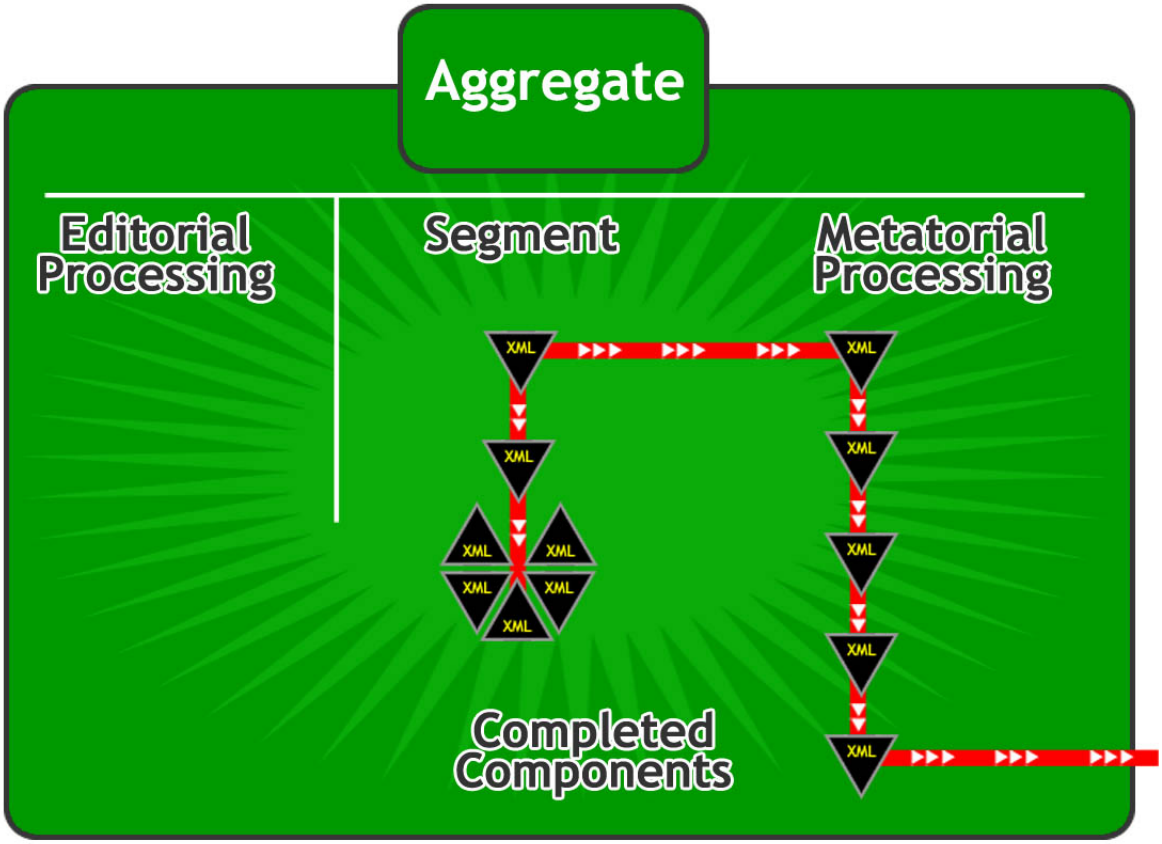

Figure 5

Conversion

This is the process of changing the metadata structure of the content (i.e., its tagging structure). During this process, the structural and the format-related codes must be both handled. A conversion problem may appear while identifying structural elements (sidebars or footers, for example) that have only format codes marking them in the source content. Another problem may appear while transforming formatting elements that don't exist in the target environment.

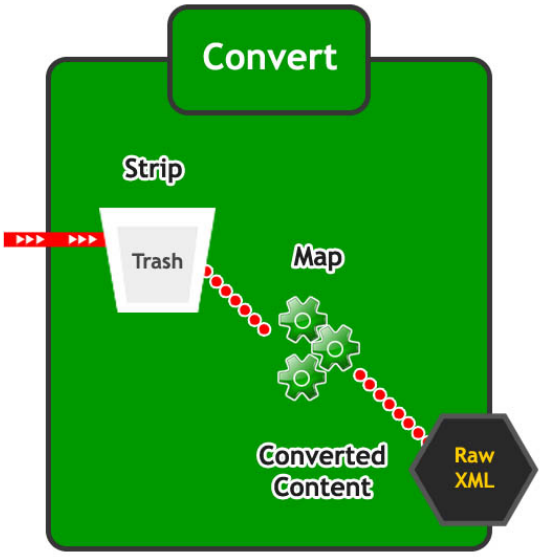

Figure 6

Editorial and Meta-tagging Services

Editorial services fit each new content component into a system of formatting, voice and style. Metadata services fit each new component into a system of structures and connections. To do their work, editors use a style guide and a meta-tagging guide.

Similar to a style guide, the meta tagging guide details the metadata information system and gives direction on how to fit new components into it. All types of content collection depend on solid editorial and meta-tagging guides.

Management

The management system is the repository housing all the content and the metadata information, as well as the one providing the processes and the tools needed to access and manage the collected content and metadata information.

Repositories have the following functions:

- Storing content;
- Selecting content;
- Managing content;
- Connecting to other systems.

Workflow

The workflow system includes the tools and the procedures that assure that the entire process of collection, storage and publication runs effectively, efficiently, and according to well-defined timelines and actions.

A workflow system supports the creation and management of business processes. In the context of a content management system, the workflow system sets and manages the chain of events around collecting, storing in a repository, and publishing the content.

To be successful, the workflow system should:

- Extend over the entire process. Every step of the process from authoring through to the final deployment of each publication should be modeled and tracked within the same system.
- Represent all of the significant parts of the process including:
    - Staff members;
    - Standard processes;
    - Standard tools and their functions.
- Provide time flow and data flow information with a variety of transitions and charting representations.
- Represent any number of small cycles within larger cycles with drill-down to the appropriate level of detail.
- Have a visual interface with cycles and players in the process represented graphically.
- Make the meta-information in the repository available. The workflow system should not have to store its own information staff members, content types, outlines, etc, but should be able to read the data that is stored in the repository, making it available as appropriate through its dialog and selection screens
- Provide a conduit to the repository for bottom-up meta-information. Whether or not the workflow system stores meta-information, its editing fields will be a natural place for staff to enter meta-information. Data such as author, status and type are entered in workflow fields. This data must then be transmitted from the workflow system into the repository.

Publishing

Content publishing is the process through which content is drawn out of the repository and formatted into websites, web services and other publications. To be flexible enough to produce a wide range of publications, the publishing system must include:

- Publication templates;
- A full programming language;
- Runtime dependency resolution;
- File and directory creation.

Benefits

A content management system helps organize and automate the collection, management, and publishing processes.

A content management system is needed when:

- There is too much information to process by hand;
- Information is changing too quickly to process manually;
- More than one publication needs to be created from a single database of content;
- The design of a publication needs to be separated from the content, so that the publication needs not be modified by hand if the page design changes.

The most current discussion of content management centers on creating large websites. While large websites are the primary use for CMS today, the potential for CMS goes far beyond the Web. A CMS can encompass an organization's entire content creation and organization system. It can provide a content repository where information can be reviewed and worked on independently, regardless of the page containing the information, and, most importantly, it can produce websites from the stored content (or any other publications you might want to create).

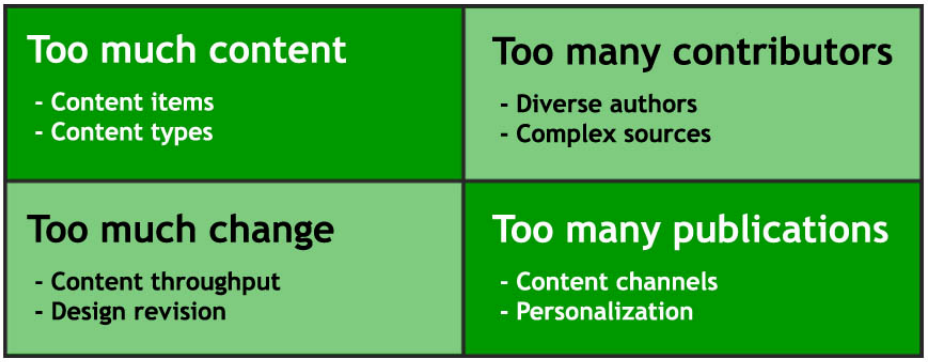

Figure 7

An enumeration of some of the benefits provided by a CMS would include:

- ***Fresh, consistent, high quality information***
  - Reduced internal and external customer discontent resulting from incorrect information;
  - Decrease of legal issues created by displaying incorrect information;
  - Increased perception of the value of information;
  - A higher likelihood of a customer visiting the site again.

- ***Reuse of content***
  - The reuse of content across multiple websites or pages, thus enhancing the productivity value;
  - The reuse of web output to broadcast over DTV, Mobile Phones, Kiosks, etc, creating new audiences;
  - The syndication and reuse of content from other suppliers is made easier.

- ***Enhanced productivity***
  - Webmasters can focus on technology and areas such as redesign and functionality;
  - Lowered production costs resulting from a more appropriate use of the web team;
  - Faster response to the changes of competitors' websites.

- ***Decentralized content creation***
  - Enables global contribution of content and information;
  - Speed-to-market changes and new content is improved by avoiding the IT bottleneck;
  - Content creators and editors are able to take ownership and responsibility for the information they provide.

- ***Centralized workflow, approval processes and rules***
  - Enables decentralized contribution without the loss of centralized process control;
  - Provides an effective audit trail to tie production with accountability;
  - Ensures a controlled flow of content around internal processes.

- ***Competitive advantage***
  - Increasingly, the website is the tool that potential students and donors use to evaluate an institution;
  - A dynamic, changing website reinforces the impression of a forward thinking institution;
  - Dynamic web content enables a fast response to changes in the institutional environment.

Return on Investment

When calculating the return on investment (ROI), one must look either at a project's long-term impact, or at its immediate return on investment.

This will vary with the type of approach and the industry that applies it. A CMS deployed at an institution like Penn State will have both a long-term and a short-term payback. CMSs offer technologies and strategies needed to streamline processes, enabling a more efficient use of resources and technologies. The result will be more compelling services that attract and retain constituent groups and provide a more efficient use of resources.

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