WEB CONTENT MANAGEMENT SYSTEM

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Abstract: The preparation and publication of a website very much depends on the requirements of contents in a website. The contents of websites may be very simple or complex. Contents of a website may need to manage as per requirement. So, a content management system passes through three stage of life cycle: content, managed and publication stage. In the present paper it is tried to study how a mathematical function can works in the three stages of web CMS. A CMS is a web application that run on web server to help facilitate creating a website. Also it is tried to study mathematically regarding working of database in web CMS.
Keywords: Content, CMS, web, database;

I. INTRODUCTION

A content management system (CMS) is a system used to manage the content of a Web site. A content management system (CMS) is a computer application that allows publishing, editing, modifying, and organizing, deleting, and maintaining content from a central interface. Such systems of content management provide procedures to manage workflow in a collaborative environment. Typically, a CMS consists of two elements: the content management application (CMA) and the content delivery application (CDA).

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                          CMS
             ┌─────────────┼─────────────┐
             ▼                           ▼
           CMA                          CDA
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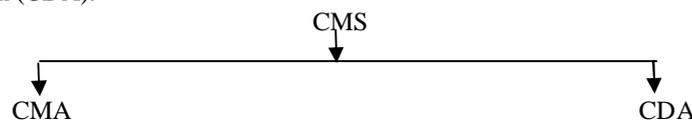
In the **Content Management application,** content manager may be able to manage the creation, modification, and removal of content from a Web site. It may happen that content manager even does not know about the knowledge of HTML (Hypertext Markup Language) or may not be experts as a Webmaster. In the **Content delivery application**, website is updated to use and CDA elements complies the information to update the website.

The features of a CMS system vary, but most include Web-based publishing, format management, revision control, and indexing, search, and retrieval. A CMS may serve as a central repository for content, which could be, textual data, documents, movies, pictures, phone numbers, and/or scientific data. So, all the works in CMS are functional and there are some composite function working to develop the content management system .CMS plays an important role in the Electronic commerce (e-commerce, or EC) which describes the buying, selling, and exchanging of products, services, and information via computer networks, primarily the Internet. In this scenario, content management system plays an important role to allow publishing, editing, and modifying content. Word Press,Drupal,Joomla are example of content management system . WordPress is an open source blog software package that works exceptionally well as content management system, a blog system, or a traditional website. Drupal is a free software package that allows anyone to easily publish, manage and organize a wide variety of content on a website. Joomla is a content management system, which enables us to build Web sites and powerful online applications.

A web content management system (WCMS) enables a user to create or amend a web page without the need for the requisite technical skills. The management of content is an important issue in web content management system. Editing, managing and publishing of a content are three pillars in the web content management system which will enhance the beauty of a web CMS . In the present paper, it is tried to study the life cycle of a web content management system mathematically where a function on a set plays an important role. Content is collection of information which is either created or acquired from the given source. So, content may be considered as a set and there is need to do some functional work on the content so that a beautiful website will be published.

II.   MATHEMATICAL   FUNCTIONING OF WEB CONTENT MANAGEMENT SYSTEM

A basic content management system is comprised of templates, a programming language, a dashboard and a database. A subsection of Content Management is Web Content Management. A Web Content Management System is a program that helps in maintaining, controlling, changing and resembling the content on a web-page. Content management system is working on functional dependency among contents (collection), management and publication of final modified contents.

A strategy of Web Content Management [13] may be as follows:

  (i)   *Identifying Content requirement*
  (ii) *Creating consistency structure content for reuse*
  (iii) *Managing Content in a definitive source*
  (iv) *Ensuring Content Compliers with corporate and government standards and guidelines*
  (v)   *Assembling content on demand to meet your customer's need.*

Keeping the above strategy a web CMS may consists of three phases in which information passes through the collection system, where it is transformed in content components, then through the management system, a kind of complex database where components are stored, and, lastly, through the publication system, where information is automatically transformed into publications[2] . Web content management system can be divided into three stages:

Stage 1: Primary Stage
Stage 2: Secondary Stage
Stage 3: Final Stage /ternary stage

A.   Stage 1 :Primary Stage

The etymology meaning of content is 'Contentum' i.e. to Contain or 'Continere' –to hold together or Enclosed.
 Content means everything that is included in a collection and that is held or included in something .In a CMS, content is data or information embodied. Primary stage is that stage where content is prepared by collecting the data /programming code. Content is combination of suitable programming code. In this stage information is either created or acquire from an existing source. Depending on the source, it may or may not need to convert the information to a master format. A Content management system template is a series of files that contain the basic layout of website or blog. These files are used in conjunction with the selected program language and a database to publish the websites..So, primary stage in web CMS is considered as collection of information. Mathematically,

Let C_i denotes content set in which information is either created or acquire from an existing source. i.e. C_i ={ information : information is either created or acquired from existing source   }, i=1,2,…..,n. Finally, it is needed to aggregate the information into the given system by editing it, segmenting it into chunks (or components), and adding appropriate metadata which is a set of data that describes and gives information about other data. Metadata is commonly described as "information about information." For Web sites, content usually has categories, keywords, authors, publishing dates, and template assignments that control how the content is displayed and used. Metadata is a set of fields and values used to describe and categorize content and managed objects [17].

B.   Stage2 : Secondary Stage
In this stage the there may need to do some modification (if required) from the given content. This is an important stage and this stage makes difference from the preparation of different types of websites.   In this stage a content may be prepare / manage by making appropriate combination of functional works on a given contents   as per requirement.The 'Management' refers to the process of storing content via rules and process (or a combination of the same) - often with associated workflows - so that the content is deemed to be 'managed' rather than 'unmanaged' where it is located.[18] In the web content management system the following terms are frequently used which are as follows [14] :

TERM	MEANING
WEB CONTENT EDITING	CREATING AND CHANGING WEB CONTENT AND ACCOMPANYING METADATA
WEB CONTENT STORAGE	ENSURING THE AVAILABILITY OF WEB CONTENT
WEB CONTENT PUBLICATION	MAKING WEB CONTENT AVAILABLE
WEB CONTENT PERSONALIZATION	ADAPTING WEB CONTENTS TO THE PREFERENCE, ROLE AND BEHAVIOUR OF PEOPLE
WEB CONTENT SYNDICATION	MAKING WEB CONTENT AVAILABLE AT DIFFERENT LOCATION
WEB CONTENT STATISTICS	PROVIDING INSIGHT INTO THE ACCESS TO WEB CONTENT.

Fig1 : The works which may be done on a content [3]

The secondary stage is working like repository i.e., a central location in which data is stored and managed. The created repository may consist of database records and/or files containing content components and administrative data (data on the system's users). For example, the dashboard of the content management system is where authorized users (people authorized to make changes to the website) make changes to the website.

So it may be considered that there exist a function f which is working on the content C of primary stage and obtain mange data.

i.e., function f : Content $\rightarrow$ management of data

$f(c) = d$ where c is member of content and d is member of managed data.

C.   Stage 3 : Final Stage /ternary stage

In this stage websites, printable documents, blogs, newsletters emails are published. In this stage content available by extracting components out of the repository and constructing targeted publications such as Web sites, printable documents, and e-mail newsletters. The publications consist of appropriately arranged components, functionality, standard surrounding information, and navigation. Publication of content is the final stage which is obtained after management of data/ function. Mathematically, let a function g may be defined as

g : Modify /management set $\rightarrow$ publication set.

III.   WORKING OF DATABASE IN WEB CONTENT MANAGEMENT SYSTEM

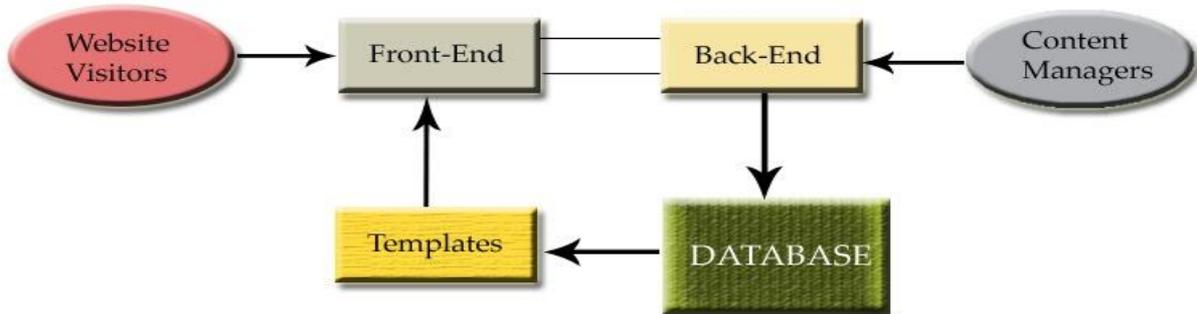The web content management system works in the following way:

Fig 2: working of website visitors and web CMS [5]

Working on Publication part is taken into mainly two parts:

(i)User /client parts
(ii)Server parts- database attached here.

A Web content management system uses a programming language to fetch the information stored in the database, format it and then present it to the viewer. There are various programming languages that can be used in the background of a website. A web content management system is usually run using a database. There are different databases available and some are only compatible with certain operating systems (online and offline). The site might also use what is called a flat file system (a text file containing database information without any program specific formatting that can be used by and manipulated by other applications).

In the following diagram it is shown working of client, server and Database relationship in web Content management System
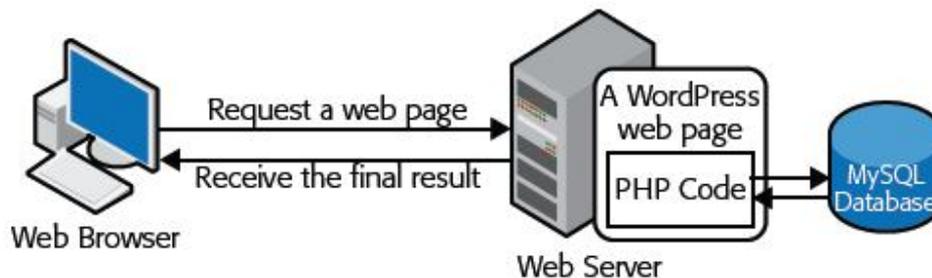

Fig3 : Working relation of client ,server and database in webCMS [6]

There is important point to note in the above figure are

(a)Php code is subset of wordpress webpage
(b)Database name of PhPMySql Database is same as Wordpress Database name.

There are virtual illustration stands that both (WordPress and PhpMyadmin/Phpcode) are different. But Phpcode are so arrange /mange that it will works as subset of wordpress. In the above diagram MySQL is database server and it is Open source and free. MySQL is supported by thousands of lowcostLinux (and Windows!) hosts, which means a very low barrier to entry for anyone wanting to start a WordPress (or database driven) website. Also phpMyAdmin is a tool written in PHP intended to handle the administration of MySQL over the Web.

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Therefore, a function f is working like

$$f: \text{set PhpMyadmin} \rightarrow \text{database mysql}$$

Then this function will be extends to the set wordpress and works like

$$f: \text{wordpress} \rightarrow \text{database mysql}$$

So, while writing name of Database in PhpMyadmin and Wordpress, the name of database PhpMyadmin and Wordpress are taken to be same.

IV.   ADVANTAGE OF WEB CONTENT MANAGEMENT SYSTEM

A. *Time saving*

To prepare a web based CMS there is need of some time. In the web CMS there is an option to make modification/ extension in the given theme to prepare the website as per requirement of users. So a web content management system is time saving in the sense that from one content it is possible to prepare different types of website.

B. *Security*

Web based CMS may be remain secure if latest plugins or themes are used. That is, there is need in the secondary stages of web CMS to be managed regularly. Also there is scope to in secondary stage of web CMS to delete default admin usernames (e.g., 'admin') and may create an option to use strong passwords (at least eight characters long).[7]

C. *Flexibility in web CMS*

A web CMS may be flexible as data are managed in the secondary stage. Themes, plugins or widgets etc. may be used to in the secondary stage to change the look of websites.   So a web CMS may be flexible.

D. *Financial management*

A financial management system is the methodology and software that an organization uses to oversee and govern its income, expenses, and assets with the objectives of maximizing profits and ensuring sustainability. In the web CMS the looks of a sites can be changed by using themes, plugins and widgets etc. There is no need to do more work on the content part. Only management on the content is more important to change the outlook of websites. So, financial management can be done on the web CMS.

V.   CONCLUSION AND FUTURE SCOPE

A web content management system (WCMS) is a software system that provides website authoring, collaboration, and administration tools designed to allow users with little knowledge of web programming languages or markup languages to create and manage website content with relative ease [15].So, a website developers will be able to prepare a beautiful website if he has good ability to manage the content. Web Content Management system allows developer to publish content to the web without having advanced knowledge of web technology or programming of any sort. Now, web content can include text, images, audio and video. Also a modern WCMS can also include workflow features like creating, storing, and updating of web pages.. So a mathematical approach of a function on a set can be helpful to manage content and will publish a very high standard and excellent website. Also, there is future scope to study the financial management of CMS in Maintenance and dealing with vast amount of data.

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