# Role of CMS Services in fulfilling the basic requirement of an ideal E-Learning website

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*Abstract*- **During the past decades, researchers, schools, and governments around the world have supported enhancing student learning by using digital tools, i.e. the e-learning. E-learning is essentially the computer and network enabled transfer of skills and knowledge. Now a day's most of the educational centers (universities, institutes, colleges and schools) are using some e-learning tools as an integral part of their learning system. An E-learning system uses the combination of Learning Management System (LMS), Content Management System (CMS), and Learning Content Management System (LCMS). In this paper we discuss about the basic services provided by CMS fulfilling supported e-learning website requirements.**

**Keywords: Content Management System (CMS), LMS (Learning Management System), HTTP (Hyper Text Mark-up Language)**

## I. INTRODUCTION

There are several challenges in supporting students' learning activity in e-Learning systems. With the use of internet technology and its phenomenal growth, has provided several automated tools for learning and sharing knowledge. As the course materials composed by the instructor are changed constantly and also commented and edited by student too. So the collection of course materials in E-Learning environment should be flexible and adaptable in content representation and management. For the purpose of content management of a website in E-Learning platform, it provides tool content management system for managing the contents available on website.

### *A. E-Learning*

E-learning comprises all forms of electronically supported learning and teaching. The information and communication systems, whether networked learning or not, serve as specific media to implement the learning process [1]. E-learning is essentially the computer and network-enabled transfer of skills and knowledge. E-learning applications and processes include Web-based learning, computer-based learning, virtual education opportunities and digital collaboration.

According to Rosenberg [2] the most important feature of e-learning is that it takes place in network environment. This means that computer of learner is in constant communication with a central server. E-learning materials are accessible via an Internet browser on learner's computer.

An ideal e-learning website must provide interactive interface and validated contents to learners, so as to provide quality education to the learner. So while developing an e-learning website more focus must be given to the management of contents. The basic requirements of e-learning website associated with CMS's services are :

1. Login ID & password
2. Faculty details
3. List of programmes
4. Scheduling tests
5. Maintaining contents/ Course material
6. Online library
7. Collecting feedback
8. Discussion forum

CMS plays an important role in managing the various contents of e-learning website. Content management system is responsible for managing course material, organization of content and securing content from unauthorized user access. Contents are most important part of e-learning system, so it should be manage, secure, maintain and organize properly in an e-learning website. In this paper we will discuss about the basic requirements of an ideal e-learning that are fulfilled with the help of various CMS services.

This paper is organized as below: the second section describes the literature survey required for identification of various services. The third section explains the relationship among the requirement and services of CMS.

## II. LITERATURE SURVEY

### *A. Content Management System*

A CMS helps instructors catalog, track, and manipulate corporate information. For an individual instructor or a person working alone, content management is usually not a critical element. A CMS is effective when large amounts of information must be tracked and managed. Such as system is not as useful for eLearning, because it lacks the end-user delivery and tracking mechanisms found in the LMS.

CMS or a Content Management System is basically designed to support educative or academic courses. It allows the instructor to create a course website, where documents can be uploaded in popular formats such as word, power point, etc. Without having to convert them to a web format such as HTML[5]. This requires few specialized skills, thus making a CMS the ubiquitous choice of instructors. It also efficiently supports distance learning because of its robust discussion board application. Instructors post the essence of the course that leads students through varied learning activities, after which the instructors supervise course discussions through the discussion board.

"A Content Management System is a collection of procedures used to describe processes in an environment that requires collaboration between different actors".

CMS offer following unique features:

- Add and/or edit web pages
- WYSIWYG Editor
- Add and edit articles
- Add, edit or delete albums
- Banner Adv management
- Job management
- Site usage tracking management
- Customer management
- Admin management

Content management systems are designed to manage data access, based on user roles, content redundancy check, collecting and sharing information. There are several researchers have given the different ideas about the role of CMS in E-learning environment. In paper [3] the author explained the extension of CMS as component based system of E-learning. In paper [4] the composition of course material based on ontology is discussed. A content management system must provide authoring, routing, updating, publishing, disseminating, archiving and security for different types of contents [6].

### *B. CMS Services*

Content management system plays numerous roles because each user of CMS sees a different function. CMS is able to play the lead role or a supporting role. CMS is software that automates human centric functions, seems to be a straightforward service. A person writes something and software puts it on the website. Services provided by Content management System are:

1. Security.
2. Learner assessment.
3. Communication.
4. Content validation.
5. Online posting of course material.
6. Manage forum.

1. Security

   In online environment security is the main issue in order to protect data. A little change in information can degrade the reliability of the website. Content security is the protection of information and system from unauthorized access, use, disclosure, modification or destruction in order to provide integrity, availability and confidentiality of the information processed in website. Content security is determining what needs to be protected and why, what it needs to be protected from, and how t protect it as long as it exists. A content risk evaluation must identify both organizational and technological issues to be effective. It must address both the computing infrastructure and the way in which learner use it as they learn. One way to provide security mechanism is providing login ID to various users. The user is divided into three categories learner, instructor and system administrator. Depending upon the type of

user different privileges is given. The system administrator is responsible for generating login id and password for user, defining their levels and operations.

2. Learner assessment
   Assessments are the foundation of effective instructional practices. The power of tests and assessments become exponentially more important with the advent of content management systems. Indeed, data from assessment help to derive the development of solid content and advanced instructional practice. As Moore(1999) noted: "In e-learning whatever the communications media used and the content level is that a good monitoring and evaluation system is likely to lead to a successful program, and a poor system is almost certain lead to failure."Moore describes the three key features of a good system as follows:
   1. The preliminary specification of good learning objectives, with this crucial question at the heart: Did each learner produce evidence of having learned what was required as specified in the learning objectives? If not, why not?
   2. The construction and handling of assessments, which are the learner's evidence of learning and an important source of feedback for the program.
   3. A good gathering and reporting system and a solid review of all the data by both instructors and program administrator.
3. Communication
   Communication is carried out through announcements of classes and other tools to communicate individually. E-learning website provides various information regarding the course schedule, list of programmes, and faculty details etc. to the learner. Content management system helps to manage these contents and provide information to the learner timely. CMS delivers communication services between learner, instructor, and programmer.
4. Content Validation
   Validation is the task of ensuring that the media content of a service is correct. There are two items needed for validation, one is an unknown piece of content and the other a set of criteria against which that piece of content can be compared. There is a wide variety of types of questions that a validation service might be expected to answer. The most important of these concern the content of the content. For example, is this the right graphic for the accompanying text? A validation service can also be used to ensure that the content is complete and uncorrupted. For example, is this video of the right length and resolution for display on the current client? Other useful features can include checking the content for any breach of copyright or unauthorized alteration to the original. In order to achieve a validation service that is functional in large scale multimedia services, validation must proceed with minimal manual intervention. The ultimate reference against which to judge the abilities of any computer based validation process is a person who inspects each piece of content manually. It is important to remember that a human faced with a new piece of content of which he or she has no prior knowledge cannot learn everything about it by examining the content itself. Therefore, we use metadata information to describe both the content and the validation criteria. Validation service has four parts. First, syntactic validation checks the technical correctness of the content, for example that media is in the correct format, or that all links in a web page are valid. Second, semantic validation determines if the content matter is correct in its current use context. Intelligent media processing will slowly replace the human user. For example, the sound analyzer can quickly indicate that a track supposed to be music, is in fact people talking. The third part adds additional metadata to the content to record the results of the syntactic and semantic validation. The final part is to secure the content for onward travel, using encryption and digital signature techniques. This means that if the content is transferred to another organization or process, the metadata can be trusted and potentially the content used without any further need for validation.
5. Online posting of course material
   Material such as power point slides and reading books can be made available online apart from the schedule of the course and its syllabus. Content management system provides service of online posting of material that help instructor to update contents of the specified subject and submit on website. It provides methods to collect feedbacks of learners and help to improve the effectiveness and quality of the content. Good quality content leads to the more satisfied learner and success of website. Learner's feedbacks play an important role in improving the standards of course material and their way of representation of content on the website.
6. Manage Forum
   The online forum content and format ensure real learning, resulting in professional development and improved job performance. Discussion forums are the most significant trend in the computer supported learning in delivery of education. Hence, there is a need to develop innovative approaches to the medium of discussion forum that are pedagogically sound, engaging for participants and more time

effective for instructors. The widely acknowledged value of learner to learner or learner to instructor interaction in promoting engagement with content and learning , initiatives that draw learner into online learning processes

## III. RESULTS

The table shows the relation of CMS services with an ideal e-learning website. It explains which requirements are fulfilled under a specific CMS service. The above services can be related to basic requirements of an ideal e-learning website as given in table shown below:

TABLE I. CMS'S SERVICE VS. IDEAL E-LEARNING WEBSITE'S REQUIREMENTS

| **Services → / Requirements ↓** | **Security** | **Learner Assessment** | **Communication** | **Content Validation** | **Online posting of course material** | **Manage Forum** |
|---|---|---|---|---|---|---|
| **Login ID & password** | Yes | | | | | |
| **Faculty details** | | | Yes | | | |
| **List of programmes** | | | Yes | | | |
| **Scheduling tests** | | Yes | | | | |
| **Maintaining contents** | | | | | Yes | |
| **Online library** | | | | Yes | | |
| **Collecting feed back** | | | | | Yes | |
| **Discussion forum** | | | | | | Yes |

The matrix representation of above table is given as below:

TABLE II. E-LEARNING WEBSITE REQUIREMENTS AND CMS'S SERVICES MATRIX REPRESENTATION

| **Services → / Requirements ↓** | **Security** | **Learner Assessment** | **Communication** | **Content Validation** | **Online posting of course material** | **Manage Forum** |
|---|---|---|---|---|---|---|
| **Login ID & password** | 1 | 0 | 0 | 0 | 0 | 0 |
| **Faculty details** | 0 | 1 | 0 | 0 | 0 | 0 |
| **List of programmes** | 0 | 1 | 0 | 0 | 0 | 0 |
| **Scheduling tests** | 0 | 0 | 1 | 0 | 0 | 0 |
| **Maintaining contents** | 0 | 0 | 0 | 1 | 0 | 0 |
| **Online library** | 0 | 0 | 0 | 0 | 1 | 0 |
| **Collecting feed back** | 0 | 0 | 0 | 1 | 0 | 0 |
| **Discussion forum** | 0 | 0 | 0 | 0 | 0 | 1 |

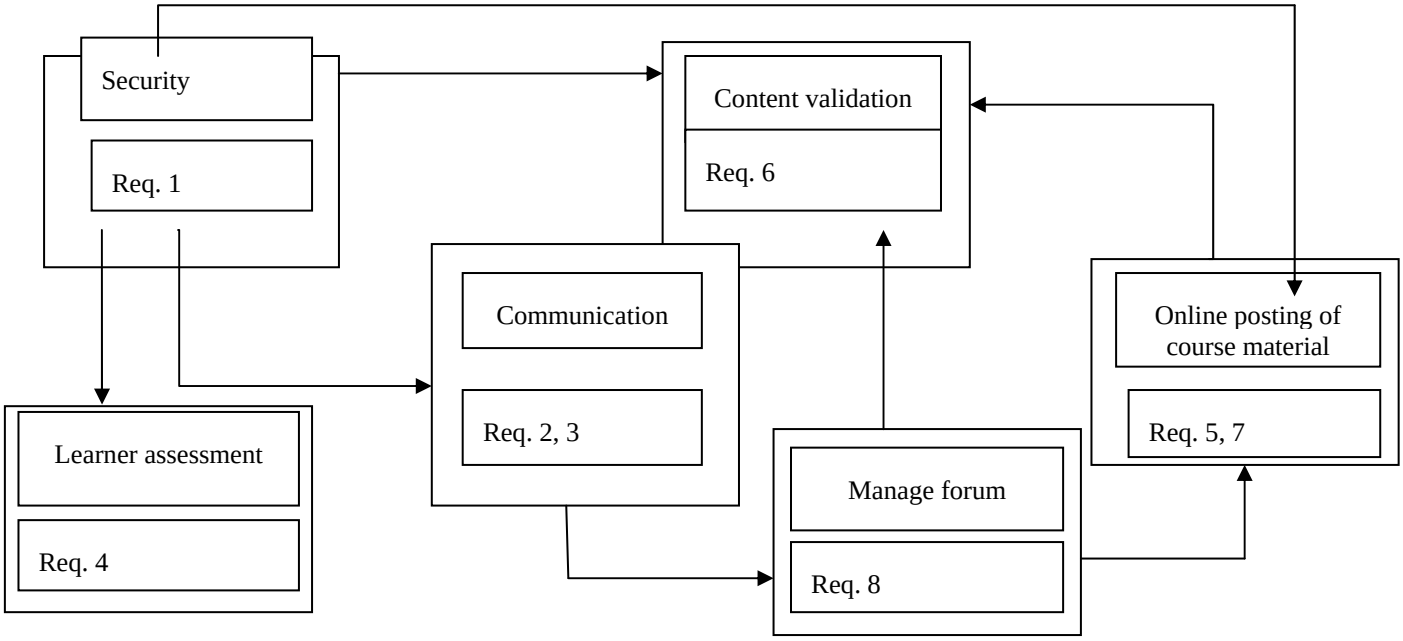


Figure 1. Service Diagram

The above matrix representation of e-learning website's requirement vs content management system's services can be represented through service diagram as shown in figure 1. In this figure, each block shows the service and related requirements to that specific service. It also represents how the content management system's services are related to each other. As shown in figure, first block contains service security and related requirement Req. 1 i.e. login id and password and this service is further related with the services content validation , learner assessment, communication and online posting of course material. After passing the security check in an e-learning website learner or instructor can use the further services

## IV. CONCLUSION

This paper focused on role of CMS services which fulfill some basic requirement of an ideal e-learning website. here in this paper we discussed about various services of a content management system which can act as aid to ideal e-learning website's requirement. There are various CMS in the market that are commercially available. If you've decided that CMS is what your organization needs, you should be applauded for understanding the power and flexibility that a CMS can provide. Further research should be focused on identifying LMS services and join these services with CMS services and develop a system that provides all these services at single platform.

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