

The Tools and technologies needed for offering e-learning Under LCMS - A Survey

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Abstract- *E-learning can be defined broadly as any use of Web and Internet technologies to create learning experiences. A learning content management (LCMS) simplifies the task of creating, managing, and reusing learning content, that is, media, pages, tests, lessons, and other components of courses. Along the way, a lot of the LCMS products on the market have become more about a kind of authoring approached with content stored in a database that is transformed into courseware. This is valuable for large scale authoring and translation of content. In this paper, focus is on major categories of tools and technologies required for offering LCMS.*

Keywords- *E-learning, LCMS, LMS, Media servers, virtual school systems*

I. INTRODUCTION

E-learning is not just concerned with providing easy access to learning resources, anytime, anywhere, via a repository of learning resources, but is also concerned with supporting such features as the personal definition of learning goals, and the synchronous and asynchronous communication, and collaboration, between learners and between learners and instructors.

E-learning can be defined broadly as any use of Web and Internet technologies to create learning experiences [1]. E-learning tools, technologies and applications have gained a lot of attention in various levels of education over the last years. It resulted in the development of a several e-learning tools. A large amount of e-learning tools therefore now exist and often can be accessed free-of charge over the internet [2]. E-learning technologies continue to expand. Today, computer and Internet technologies are more integrated with professional, academic, and personal lives. Instructional designers have access to more and more new flexible technologies, as do learners have a multitude of choices and a Masters in Instructional Design is one avenue of getting there. These technologies are opening ways for courses, seminars, discussion forums and other approaches to learning to be delivered online with innovative ways to interact with instructors and other students. The following are different learning technologies in use today. Various tools are used in e-learning environments [3].

II. E- LEARNING

E-Learning system has its origin in computer-based training (CBT), which attempt to replicate autocratic teaching styles and develop self-paced learning. Standard or traditional learning processes can be characterized by centralization of authority (content is selected by the educator), strong push delivery (instructors push knowledge to students), lack of a personalization (content must satisfy the needs of learner) and the linear/static learning process (unchanged content). These type of learning processes results in an expensive, slow and too unfocused (problem independent) learning process. But the focus of E-Learning is to extend and improve the users and business' needs and to remove the barriers of time and distance. Key to success is the ability to reduce the cycle time for learning and to adapt "content, size and style" of learning to the respective user and their business environment. This can be solved with E-Learning, i.e. with a distributed, student-oriented, personalized, and non-linear/dynamic learning process.

A. Benefits

There are several benefits to e-learning. Some of the benefits are listed below.

1) Availability

Learners can access the e-learning contents anywhere, any time.

2) Cost effective and saves time

When delivered through technology based solutions, training is less expensive per end user due to scalable distribution and the elimination of high salaries for trainers and consultants.

3) Just-in-time access to timely information

Web based products allow instructors to update lessons and learning materials across the entire network instantly. This keeps content fresh and consistent and gives students immediate access to the most current data. Information can be retrieved just before it is required, rather than being learned once in a classroom and subsequently forgotten.

4) Higher retention of content through personalized learning

Technology-based solutions allow more room for individual differences in learning styles. I also provide a high level of simulation that can be tailored to the learner's level of proficiency.

People can learn at their own pace and review course materials as often as needed. Students can have more control over their learning process and can better understand the material.

5) *Improved collaboration and interactivity among students*

In times when small instructor-led classes tend to be the exception, electronic learning solutions can offer more collaboration and interaction with experts and peers as well as a higher success rate than live alternative.

B. *Types of participants and processes*

There are three different types of participants in e-learning.

1) *Producers*

Include the designers, authors, writers, illustrators, photographers, animators, videographers, and other creative souls who collectively bring e-learning products into being.

2) *Learners*

They are typically called students. If the e-learning is designed as an online document or knowledge-management system, they are referred to as users or readers.

3) *Host*

It is the organization that makes e-learning widely available over a network, so the learning product is accessible by learners and those who must administer, maintain, and support it.

The process involved are:

The process of *creating* covers the activities of producers as they author and integrate components into an e-learning product and transfer that to the host, which offers the e-learning. Likewise, *accessing* refers to activities performed by the learner who locates, logs into, and experiences the e-learning.

In a nutshell,

- Producers create e-learning
- Hosts offer e-learning
- Learner's access e-learning

Each of the participants requires three forms of technology: hardware, a network connection, and a software.[1]

III. TYPES OF E-LEARNING

There are several ways e-learning is used today.

A. *Learner-led-e-learning*

It aims to deliver highly effective learning experiences to independent learners. Content may consist of web pages, multimedia presentations, and other interactive learning experiences housed and maintained on a web server.

B. *Facilitated e-learning*

It combines the reliance on Web content found in learner-led e-learning with collaborative facilities found in instructor-led e-learning. It works well for learners who cannot conform to the rigid schedule of class room training but who want to augment learning through discussion with other learners as well as with a facilitator.

C. *Instructor led-e-learning*

It uses Web technology to conduct conventional classes with distant learners. These classes use a variety of real-time technologies, such as video and audio conferencing, chat, screen-sharing, polling whiteboards, and the plain old telephone.

D. *Embedded e-learning*

It provides just-in-time training. It is usually embedded in computer programs, Help files, Web pages, or network applications. The table 1 shows the technology learner-led e-learning might need, grouped by the type of people involved. [1]

IV. FUNCTIONS OF TOOLS FOR OFFERING E-LEARNING

Tools for offering e-learning make sure that the created e-learning can be accessed by learners- conveniently and efficiently.

Functions of tools offering e-learning are:

A. *Making e-learning available over a network*

This activity is referred to as publishing a course. As its name suggests, publishing makes the course public.

B. *Administering e-learning offering*

Common tasks include enrolling learners in courses, assigning administrators and instructors to courses, collecting fees, and churning out required reports.

C. *Controlling and tracking access taken and completed*

Controlling and tracking access to the course, lessons, and individual objects of the offered e-learning. Tools may be needed restrict access to registered learners and log which modules they have taken and completed. Offering may also require recording scores on individual tests and the graded activities.

V. CATEGORIES OF OFFERING TOOLS

A. *Web servers*

It is using to deliver Web pages and other media requested by a Web browser.

- B. *Learning management systems (LMS)*
LMS is to administer courses and students
- C. *Learning content management systems (LCMS)*
LCMS is to assemble and offer courses made up of reusable content modules.
- D. *Collaboration tools*
It is to enable fluid communication among distributed learners
- E. *Virtual-school systems*
It is to conduct instructor-led learning over the network
- F. *Media servers*
It is to deliver sound, video, and other dynamic media efficiently over the network.

TABLE 1: TECHNOLOGY FOR LEARNER-LED E-LEARNING

PRODUCER	HOST	LEARNER
<ul style="list-style-type: none"> ➤ Video and audio capture equipment. ➤ Multimedia workstations for creating and editing video, audio, graphics, and animations ➤ Moderate speed network ➤ Web-site authoring tools, for creating individual Web pages, organizing Web sites, and maintaining links ➤ Course authoring tools ➤ Multimedia tools, for editing video, audio, photographs, etc. 	<ul style="list-style-type: none"> ➤ Server hardware ➤ Server operating system ➤ Fast internet connection firewall ➤ Modems for remote users if the content is hosted behind ➤ Streaming media server software ➤ LMS for enrolling and tracking learners. ➤ LCMS for reusing content modules 	<ul style="list-style-type: none"> ➤ Multimedia-capable computer ➤ Internet connection ➤ Web browser ➤ Media players for playing media types not handled by Web browser

VI. LEARNING CONTENT MANAGEMENT SYSTEMS

A LCMS simplifies the task of creating, managing, and reusing learning content, that is, the media, pages, tests, lessons, and other components of courses.

I. *What an LCM does?*

LCMSs manage learning content by maintaining items of content in a central repository. From this database, instructional designers can organize, assemble, approve, publish, and deliver courses and other learning events. An LCMS lets authors create, store, and refine learning objects or other units of content. It helps learners locate and take just the learning they need at the moment. LCMSs are closely related to content creation and display tools. With a full featured LCMS can,

- Efficiently create semi-custom courses.
- Manage complex projects involving many authors and different types and levels of content. Create derivative courses and other forms of content
- Track course access at the level of the individual module or learning object.
- Deliver content in different formats, such as via the Web, on CD-ROM, on mobile devices, and as paper workbooks.

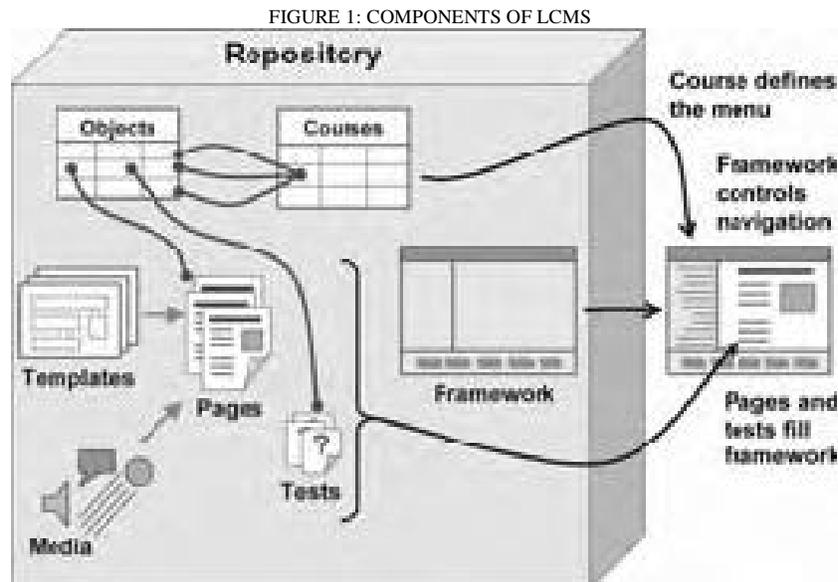
II. *How an LCMS works?*

No two LCMSs are exactly the same, but central to most of them is a repository of components needed to courses. LCM may contain the items like,

- Raw ingredients of courses, such as HTML pages, XML data, media components, and other raw materials.
- Test questions that can be used measure accomplishment of a learning objective.
- Definitions of learning objects that combine raw ingredients and tests to completely accomplish a learning objective.
- Definitions of lessons and courses that specify how to combine learning objects and other ingredients.
- Templates and style sheets to control the appearance of a course and customize it for various delivery mechanism.
- A framework for navigation and user interface, including menus and course maps.

For each of these items, the LCMS may also store metadata, which describes the items in detail. Figure 1 shows the how the components are related to one another. Authors and other content developers create the media, tests, and other raw ingredients and enter them into the repository. Using templates or starting from scratch, they combine media to form pages. Then they define learning objects in terms of a learning objective and the ingredients needed to accomplish that objective. Lessons and courses are defined in terms of the learning objects they contain.

Authors may also define a framework to control navigation and provide a user interface for the course. When a course is needed a copy of the framework is made. From the course definition, a menu is generated for course. As learners select from the menu, pages, tests, and other components are displayed in the framework. [4]



VII. POPULAR LCMS PRODUCTS

The list of learning content management system is long and includes tools with a wide range of capabilities. Some of the LCMS products are listed table 2.[5][6]

TABLE 2 - LCMS PRODUCTS

PRODUCT	WEB ADDRESS
eXact learning solutions	www.exact-learning.com
CD2 learning	www.cd2learning.com
Carlo LCMS	www.dominknow.com
IBM Kenexa LCMS Premier	www.kenexa.com
Learnative	www.learneactiveuk.com
360training.com	www.360training.com
Brightwave	www.brightwavegroup.com
LEO	www.leolearning.com
AccessPlantIt	www.accessplanit.com

VIII. CONCLUSION

E-learning technologies continue to expand. Today, computer and Internet technologies are more integrated with professional, academic, and personal lives. Instructional designers have access to more and more new flexible technologies, as do learners have a multitude of choices and a Masters in Instructional Design is one avenue of getting there. These technologies are opening ways for courses, seminars, discussion forums and other approaches to learning to be delivered online with innovative ways to interact with instructors and other students. The following are different learning technologies in use today. Various tools are used in e-learning environments. New e-learning technology continues to become increasingly accessed and implemented by people of all walks of life. Increasingly, the technologies are becoming more integrated as an invisible and ubiquitous part of a global system. Choosing an LCMS is hard work and requires a broad perspective. For this task, pull together a team drawn from your instructional designers, media developers, and IT specialists. Include potential learners, too.

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- [5] <http://www.mlevel.com/best-of-elearning-2015-finalists-revealed/>
- [6] <http://www.elearninglist.com/elearning-services?service=LCMS+Software>