OEF: AN ONLINE EXAMINATION CONTROL SCHEME FOR WEB BASED E-LEARNING

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ABSTRACT

E-Learning is an extension of distance education enabled by the new information and communication technologies. Web-based distance learning, empowered by the Internet and telecommunication technologies, supports significant improvement in the delivery of online courses and training and mainly examinations. Now a day taking the examination in the confidential way is main issue.

Its very difficult to keep a track on assignment related work and performance of the students. And there is possibility of biasness. To minimize the hectic job of setting the paper i.e. collecting the questions for different levels and then setting the paper, considering these drawbacks the   Online Evaluation Framework (OEF) system is introduced.

Using the framework Online Evaluation Framework (OEF) we can have a very confidential and smooth conduction of examination. We can create the question repository for all the question and in a proper ordered way for setting the question sets. The OEF also has the provision of multilingual question and answer display. Apart from that the facility of supervised and non-supervised examination is there and hence it gives more customization to the system. There is provision of hiding the learner identity at the time of evaluation, which takes away the biasness. Marks obtained and corrective feedback suggested by the evaluator is also available in the inbox of the learner and on the basis of that there is again the facility for re-submission.

Keywords: E learning, Online Evaluation Framework (OEF) system, Question repository

INTRODUCTION

India is one of the fastest enhancing countries in the field of education and information technology and education too. One of the major developments in field of education is E-Learning. Electronic learning (or E-Learning or E-Learning) is a type of Technology supported education/learning (TSL) where the medium of instruction is computer technology. Critically, according to Mr. Bersin "E-Learning refers to the use of internet technology for delivery management and measurement of any form of corporate training". In India, E-Learning is not as efficient as in other developed countries. This paper highlights certain factors, which affect E-Learning process in India, and also talks about the different measures that should be taken to flush out these problems.

Information technology is changing the fundamental ways people learn. Acquisition of knowledge is not restricted to taking place in traditional classrooms. Learning methods are becoming more and more portable, flexible, and adaptive.

E-Learning is an extension of distance education enabled by the new information and communication technologies. E-Learning most often means an approach to facilitate and enhance learning by means of personal computers, CDROMs and internet.

Web-based distance learning, empowered by the Internet and telecommunication technologies, supports significant improvement in the delivery of online courses and training. Today, advances in communication and multimedia technologies make providing multimedia learning content to remote students via the Internet a reality, enabling users to take advantage of diverse human senses and increase their interest.

Communication technologies used in E-Learning Communication technologies are generally categorized as **asynchronous** or **synchronous.**

Asynchronous activities use technologies such as blogs, wikis, and discussion boards. The idea here is that participants may engage in the exchange of ideas or information without the dependency of other participants' involvement at the same time. For example electronic mail (Email).

Synchronous activities involve the exchange of ideas and information with one or more participants during the same period of time. For example a face-to-face discussion.

LITERATURE REVIEW

eLearning has come a very long way since its early days of being text-based via the Web or CD-ROM.

"People in the field of e-learning began to realize that you simply cannot put information on the web without a learning strategy for the users. "...In order for technology to improve learning, it must 'fit' into students' lives…not the other way around. As a result, e-learning was born." (Clark, 2002)
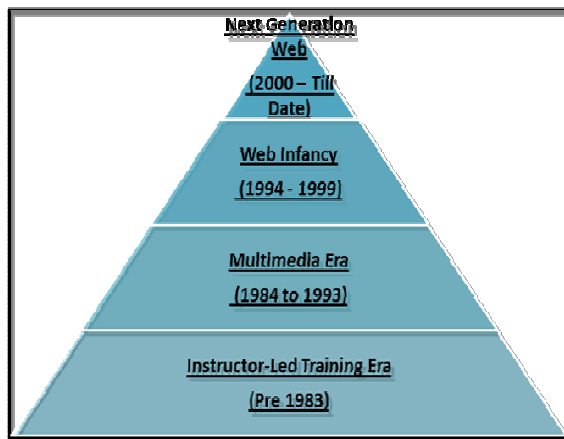

Figure: - Pyramid representation of how e-Learning has evolved.

Instructor-Led Training Era (Pre 1983): Before computers were widely available, instructor - led training (ILT was the primary training method. ILT allowed students to get away from the office to focus on their studies and to interact with their instructor and classmates.

Multimedia Era - (1984 to 1993): In the early 1990s, many companies were using videotape-based training for their employees. At this point, the industry "...represented a very small market and lacked the 'scalability' that is so important in today's applications." (Cooke, 2004)Windows 3.1, Macintosh, CD-ROMs, PowerPoint marked the technological advancement of the Multimedia Era.

Web Infancy - (1994 - 1999): The advent of email, Web browsers, HTML, media players, low fidelity streamed audio/video and simple Java began to change the face of multimedia training. Basic mentoring via email, intranet CBT with text and simple graphics, and Web-based training with low quality intermittent deliver Web costs emerged.

Next Generation Web - (2000 – Till Date): Technological advance including Java/IP network applications, rich streaming media, high-bandwidth access, and advance Web site design – are revolutionizing the training industry. Today, live instructor led training (ILT) via the Web can be combined with real-time mentoring, improved learner services, and up-to-date, engaging "born on the web" content to create a highly-effective, multi-dimensional learning environment.

The early 90's: Up until about ten years ago, training was not done in front of a computer, but in the classroom with a qualified trainer. As technology improved, companies began to integrate training with the computer and the field of e-learning began to take shape. In the early 1990s, many companies were using videotape-based training for their employees. At this point, the industry "...represented a very small market and lacked the 'scalability' that is so important in today's applications." (Cooke, 2004)

Video training : The idea of putting training on video was a good idea, though it was lacking in a few areas (1) customization based on needs of users, (2) expensive to maintain and (3) could not be upgraded easily. These videos often had limited interactions which lead to the nearly impossible task of tracking progress and assessment. (Cooke, 2004).

Computer Based Training (CBT)

Since it was obvious that video was not the best solution, a new form of training evolved, CBT or Computer Based Training. "Windows 3.1, Macintosh, CD-ROMs, PowerPoint marked the technological advancement of the Multimedia Era" (Kiffmeyer, 2004)[1]. CD-ROMs could be cheaply produced so that the problem of checking in and out videos was eliminated. Employees were also be able to simply pop in a CD to their personal computer at their desk and complete the training.

Although the CD-ROM Computer-Based Training made advances toward the better, it still lacked the ability to track employees' performance in a central database and was also not as easy to upgrade. All these problems would disappear with the use of the Internet as a means of delivering content. The problem was, when the content was placed on the web, it was simply text to begin with and maybe a few graphics. "No one really cared about the effectiveness of this new medium – it was just really cool." (Cooke, 2004)

eLearning

One of the first innovations in actual e-learning was the LMS or Learning

Management System. "The first Learning Management Systems (LMS) offered off-the-shelf platforms for front-end registration and course cataloguing, and they tracked skills management and reporting on the back-end." (Clark, 2002)[2] This enabled schools and companies to place courses online and be able to track students' progress, communicate with

students effectively and provide a place for real-time discussions.

The eClassroom evolved shortly after, which are "...web-based synchronous events with integrated CBT and simulations." (Clark, 2002)[3]

eClassrooms are often called Live Instructor-Lead Training or ILT. "Live instructor-led training (ILT) via the Web can be combined with real-time mentoring, improved learner services, and up-to-date, engaging "born on the Web" content to create a highly-effective, multi-dimensional learning environment." (Kiffmeyer, 2004)[4]

eLearning has come a very long way since its early days of being text-based via the Web or CD-ROM. So what does the future hold? There really is no saying where the field is headed. As long as training is continually geared towards the learners and strategies are used in the training, there is no end in sight for e-learning.

The evolution of online education (courses with at least 80% of the content being offered online) in recent years has been closely followed by an equally significant increase in the quality of e-learning platforms. In[5], Allen et al. show that online enrollment in the U.S. for the 2005–2006 courses had its largest percentage increase of 35%.

Learning management systems (LMSs) are at the technological core supporting this type of education. A few years back, the available platforms were mainly commercial with a few open source prototypes with limited functionality. But the landscape has changed significant[6]. A growing market is in demand for open-source LMSs which are being considered as viable alternatives to commercial tools.

In 2004, Wachholz identifies the components of E-Learning as Strategic planning and vision statement, Curriculum and content, Use of Internet and acceptable use policies, CT and Education Reform, managing changes, Quality assurance and Accreditation, Connectivity, infrastructure and network, Professional Development, Intellectual development and copyright, Intergovernmental Issues.

Recently in USA, a new concept of E-Learning called 'e-Doctors' have been discovered. In e-Doctors a person can consult his/her doctor through internet.

PROBLEM DEFINITION

There are some major deficiencies in the traditional classroom approach. The traditional classroom approach is teacher

centric and content centric pedagogy, the design, development and delivery is also more of teacher centered. Even the content flow is teacher centered. The personalization is minimum in the traditional classroom approach. Even the content is also related to information only.

Today, there is a need of an education system which is more of learner centric. The design, development and delivery should be learner centered. The content flow should be learner specific. In short the education system should be completely customizable and it should be more of performance based instead of information based only. There should be a borderless collaboration through services for collaborating with peers and learning facilitators.

In every learning process it is very important to conduct examination because evaluation of students is very important part of any education system. For any exam there are some evaluation criteria, some set of rules and some parameters which should be defined in advance.

In classical way all this task is done manually by all question paper setters for different subjects which consumes a lot of time as well as a lot of effort is also required. The storing and managing these questions also has their own limitations.

The other problem related to the system is that the questions are displayed or presented to the students in a single language. That again shows lack of customization. In classical system it is a bit hard to keep track of the assignments related work and performance of the students. The workflow to manage the tasks to be performed by individual users is also manual. Scheduling assignments, collecting it, assessing it, and then giving the marks or the feedback is again a very tedious and time consuming task for the current system. The system is manual so the possibility of biasness is also there. Getting information in time is also an issue in manual system.

To minimize the hectic job of setting the paper i.e. collecting the questions for different levels and then setting the paper, this project is introduced.

This system introduces a framework for providing a simpler and faster way for setting the paper for examination at different difficulty levels.

OBJECTIVE OF THE SYSTEM:

Considering problem statement we framed following objectives.

1. This system provides a global question repository with the

following features. Questions should segregate according to Question Type ,Difficulty Level,

2. Language
3. Questions should fetch dynamically from the repository during the examination.
4. The paper setter himself should not know the sequence of questions (randomization in selection of questions)
5. Papers for examinations can be set with easy process.
6. Get SCORM standardization of international QTI standards
7. Papers can be edited and can be deleted at any moment.
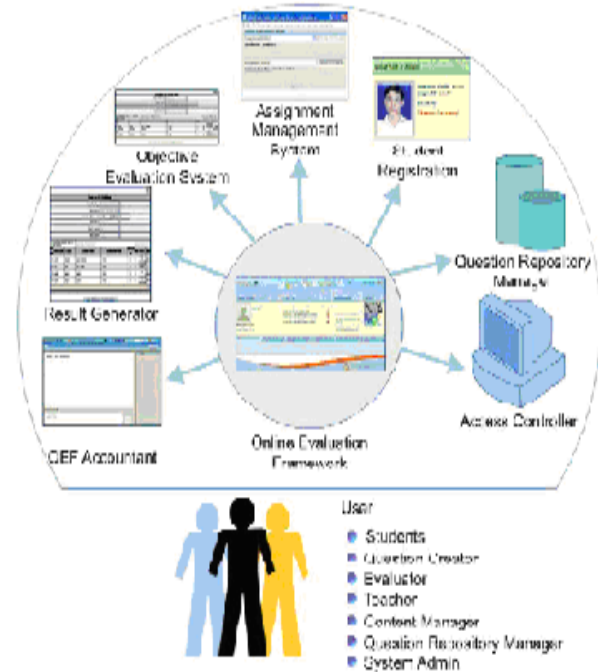
Online Evaluation Framework

Evaluation has a key role to play in the process of learning. Evaluation can be transformed into a Learning Experience by experimenting different types of questions based on individual's learning path, thereby transforming evaluation into a learning experience. Online Evaluation Framework (OEF) is a collaborative framework that facilitates Online Assignment Management and conduct of Objective Type Tests with various types of questions.

Components of the entire Online Evaluation Framework are as follows:

- Objective Evaluation System (OES)
- Assignment Management System (AMS)
- Question repository manager
- Result generator
- System Controller
- OEF Accountant

Feature of Online Evaluation System (OES):

Online Evaluation System (OES) also has an inbuilt engine to conduct Objective Type tests with functionality offered to evaluators to frame variety of questions to assess learners based on Blooms Taxonomy. There are different types of questions like Multiple choice single correct, Multiple choice multiple correct, Match the following ,Fill in the blanks, Picture Identification ,

Jigsaw puzzle, Crosswords, Hotspots, Second Level Reasoning, Concept Map.By following international QTI

standards prescribed by SCORM, to maintain the question repository, different question parameters are stored, viz difficulty level, type, marks, and associated learning unit. Continuous up-gradation of the question repository enables the question paper setter to go for varied combinations while designing the paper structure. Also, framework supports random paper generation. Learner authentication features such as photograph and signature display on the screen are also best supported by the system. Some of the important distinguishing features include test attempt record, result, and crash and recovery system.

Features of Objective Evaluation System

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- Different types of questions include - Multiple choice single correct, - Multiple choice multiple correct, - Match the following, - Fill in the blanks, - Picture Identification, - Jigsaw puzzle, - Crosswords, - Hotspots, -

Second Level Reasoning and - Concept Map

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Assignment Management System (AMS)

Authenticated Personal Interfaces: Teachers (Faculty), Evaluators (Assistant Faculty), Tutor (Lab instructor) and administrators can post assignments for the learners based on the course structure through authenticated personal interfaces.

Assignment Randomization**:** Various assignments can be given to multiple learners randomly by using assignment randomization.

Submission and Evaluation**:** Learners can download, complete and then submit the assignments online for approval and feedback from the assistant faculty or local tutor which, after approval are made available to the evaluators. In case of Supervised Final Examinations, assignments can directly be routed to the evaluators for final evaluation.

Workflow: The automated workflow in the system keeps track of every assignment of individual learner. Framework also offers the facility to the learners to get the assignments evaluated from best of the evaluators.

Learning Content Management System

Learning Content Management System (LCMS), which is a multi-user environment to create, store, reuse, manage, and deliver digital learning content from a central object repository. LCMS allow users to create and reuse small units of digital learning content. LCMS manages the process of creating, storing and delivering learning content.
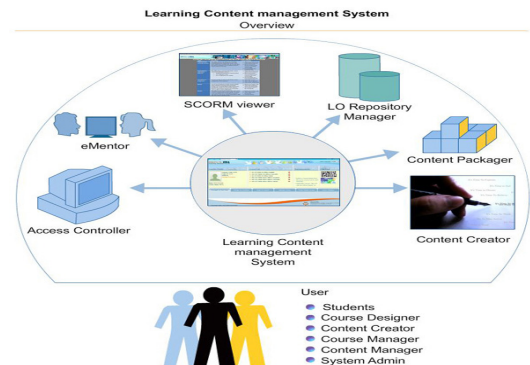
SCOPE OF THE SYSTEM

Hence with the help of Objective Evaluation System (OES) this entire task can be minimized to a very atomic one. Using the framework Online Evaluation Framework (OEF) we can create the question repository and this repository will be the global question bank (source) for all the question setters and in a proper ordered way for setting the question sets. The OEF also has the provision of multilingual question and answer display. Apart from that the facility of supervised and non-supervised examination is there and hence it gives more customization to the system. The proposed system also keeps track of every learner's assignment progress automatically. Automated workflow is

there to manage the task to be performed by individual users. Scheduling of assignments, submitting, and assessing have been automated in the proposed system. There is provision of hiding the learner identity at the time of evaluation, which takes away the biasness. Marks obtained and corrective feedback suggested by the evaluator is also available in the inbox of the learner and on the basis of that there is again the facility for re-submission.

All the manual work will be automated and with very simple steps one can create the question sets with appropriate difficulty levels for different learning units and with a small amount of time.

Using OES the task speed will be much faster and all the drawbacks with the existing system will be eliminated as the question repository is available with different levels of features and are created and monitored by different hierarchy of expert users. With continuous up-gradation in question repository, question paper setter will get a large combination of question sets to design the question paper structure.

MERITS OF THE SYSTEM

- An inbuilt engine to conduct Objective Type tests with functionality offered to evaluators to frame variety of questions to assess learners

- It follows international QTI standards prescribed by SCORM, to maintain the question repository, different question parameters are stored, viz: difficulty level, type, marks, and associated learning unit

- Continuous up-gradation of the question repository enables the question paper setter to go for varied combinations while designing the paper structure. Also, framework supports random paper generation

- The automated workflow in the system keeps track of every assignment of individual learner. Framework also offers the facility to the learners to get the assignments evaluated from best of the evaluators.

- Support for different types of objective questions

LIMITATIONS OF THE SYSTEM

- Full dependency on computers might hamper the reliability of the system.

- The system will require a higher configuration of hardware and software resources

- The requirement of internet connection bandwidth increases with the increase in number of users

- The system may face problems in implementations because of unavailability of high speed internet connections at many centers.

CONTRIBUTION OF THE SYSTEM

Using the framework Online Evaluation Framework (OEF) we can create the question repository and this repository will be the global question bank (source) for all the question setters and in a proper ordered way for setting the question sets. The OEF also has the provision of multilingual question and answer display. Apart from that the facility of supervised and non-supervised examination is there and hence it gives more customization to the system. The proposed system also keeps track of every learner's assignment progress automatically. Automated workflow is there to manage the task to be performed by individual users. Scheduling of assignments, submitting, and assessing have been automated in the proposed

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CONCLUSION

The key to efficient E-Learning process in a broader sense lies in the hands of ISPs, institutions and the instructors. They are the one who can make any E-Learning process efficient and complete. Apart from this basic computer knowledge should be

made compulsory at the very beginning. E-Learning is the future of learning process and we have to be all prepared to stand tall among masses.

Learning management systems (LMSs) are at the technological core supporting this type of education. A few years back, the available platforms were mainly commercial with a few open source prototypes with limited functionality. But the landscape has changed significantly. A growing market is in demand for open-source LMSs which are being considered as viable alternatives to commercial tools.

This demand stems not only from the increasing number of online students but also from the need for sustained innovation in the functionality offered by these platforms. The open-source paradigm is known to fit nicely into this type of environment.

E-learning systems also represent a fundamental means to offer educational services to people with disabilities, who typically have difficulties to attend traditional on-site learning programs or to gain access to traditional printed learning materials. Moreover, mobile e-technologies represent effective means to match skills of disabled learners and requirements/demands of the environment

surrounding them, because of devices limited capabilities.

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