Object Oriented Design of E-learning System for Distance Education

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Abstract: E-Learning, an important component of E-Education, is a novel system for communication between learners and teachers. In this paper we have tried to design an Object Oriented UML based E-Learning system for distance education of an institute with the objective to enhance the quality of teaching learning process in distance mode. The various objects participating in the system have been identified and shown by USE CASE diagrams and the object oriented development process, object to object communication among the objects, is shown by sequence diagram.
Key words: E-Education, Distance Education, Digital library, O-O Design

I. Introduction

E-Learning allows learners to study from home, minimizes the distance between learners and teachers, and enables institutes to provide a high quality education with minimum cost through distance mode.

Distance education is really a golden opportunity for those who are not in a position to continue their education in normal mode, attending classes regularly, due to some reasons. Some disadvantages of distance education which does not include direct provision of regular interaction between a student and a teacher, no question of revision, etc may be solved by e-learning. In e-learning, a component of e-education, instructions are imparted with the help of computer and communication technology.

The ultimate objective of e-learning is to guide the learners in every corner including remote place of the country and thereby providing education for all.

E-Learning covers a wide set of application and processes. It involves delivery of content of resources for learning via different communication protocols. It is a continuous process where the learner deprived to attend formal mode of education.

E-Learning mechanism involves a variety of professionals such as Instructional designers, Course Writers/ Content Creators, Reviewers, Graphic Designers and Knowledge Organizers/Library, and Information Professionls. Vental and Prakash [4] have described the following figure of e-education environment for higher education.
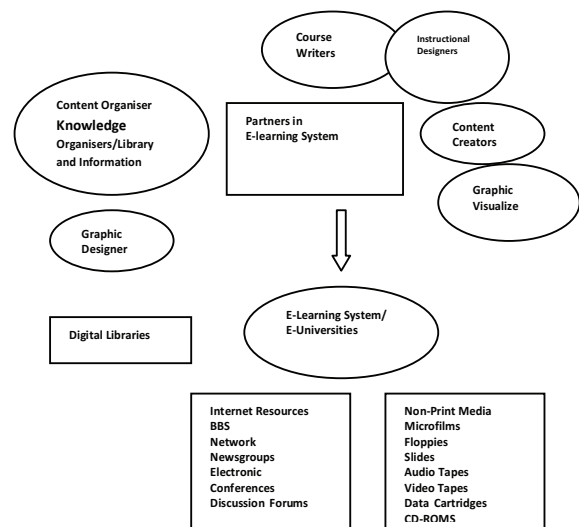
The web is a powerful information delivery mechanism. It has lots of information, which can get to the learner fast. The crucial issue is there must be a real value to the information that is being posted on the web. The web is conceptually a kind of library, so called Digital Library, a storehouse of information to go to, in order to get something to read and something to do.

Information collection, organization and dissemination greatly affected by technology thereby making/the predictions of Lancaster's paperless society to reality. Digital Library collection contains fixed , permanent documents. Not only that current Libraries have more dynamic collections, but digital environment will enable of quick handling. Digital Libraries [1] are based on digital technologies. These will break all the physical barrier of data transfer. It can store the large amounts of information in various form i.e. text, audio, video and graphic material. Learners can make effective search for the information in digital libraries with sophisticated search engines. Learner can browse required material and can easily download into his/her system. Overall the Digital Libraries will greatly support the e-Learning environment.

Typical e-learning web content one normally finds on the web:

Read text: press button for next page.

Read text: make choice from numbered list; receive score.

Read question: answer; get feedback; read next question.

Read lots of text; answer questions at end.

Take test immediately; learn score; get feedback.

These examples are simply imitating the commonly accepted notion of what education looks like-which does not involve the way people really learn. "People really learn by doing a task they care about, failing and redoing it until they get it right".

Object oriented system design using UML [2,3] is an important research activity now-a-days. Different steps of O-O design are design of classes, identification and construction of different objects, and ultimately establishing object to object communication.

II. Objective of E-learning

The main objective of e-learning is to guide the student / learner of every corner of the country. E-learning provides education all times so there is notes question of day and night . Students are free to access their notes / tutorials and assignments any time.

III. Benefits of E-learning in Distance Education

The benefits of e-learning in distance education is summaried below

- Minimize the distance between the learner and teacher . e-learning allows people to study from home.
- e-learning provides a high quality and efficient educations with minimum cost.
- e-learning provide education in 24X7 mode.

IV. Objects for e-Learning system and Use cases

Learner: End users of the system as shown in Use Case 1 of learner.

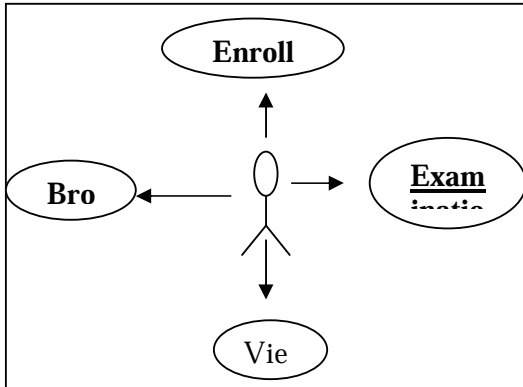Course Designer: Responsible for designing course curriculum.

Content writer: Responsible for writing the course materials for a particular course.

E-Course library/ Digital Library: Output of Course Designers and Content writers.

Administrative Manager: He/She is in-charge of over all administrative functions.
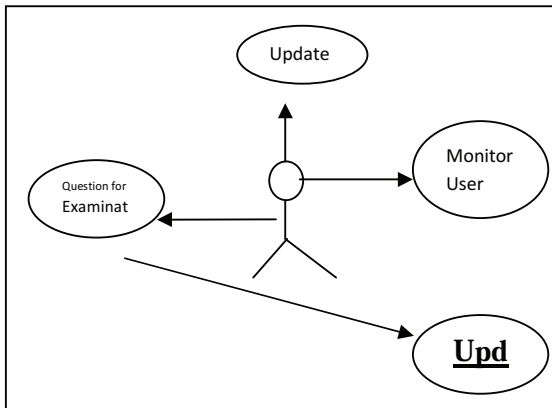
Briefly we describe the use cases as follows:

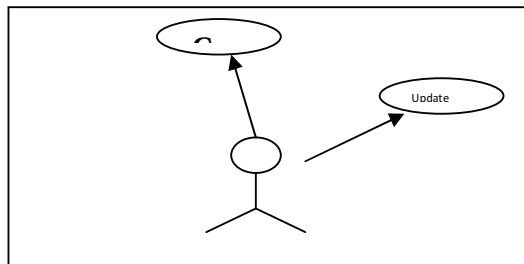Use Case 1: Learner-Different Cases are Enrollment, View course, Browse, and Examination.

Use Case 4: E-Course Library/ Digital Library - Five possible Use Cases are provided here, namely, Login, course, Internet resource, non print media and Update Library. Learners have to login to the system first. Digital Library contains several course materials in digital form may be available in CDs/Pen drives or through Internet. Digital Library must be updated regularly.

Use Case 1

Use Case 2: Course Designer- Four different cases for course designer are Update course, setting question papers, updating model questions, monitor users (learners) performances.
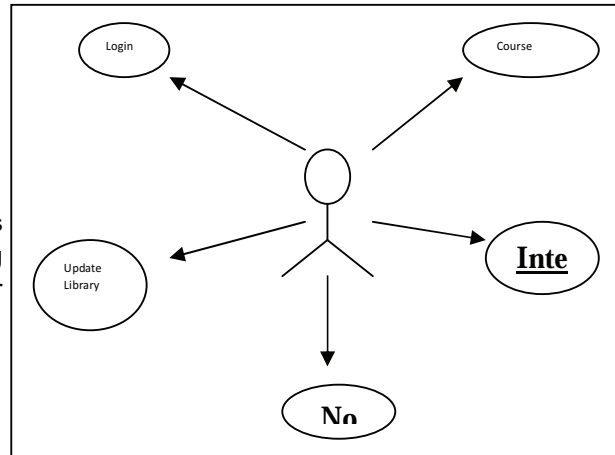

Use Case 4

Use Case 5: Administrative Manager- Six different Cases have been proposed for administrative manager. These are Guideline to be given to the learners, Form Design, supervise the course may be named as Course Monitoring, fees collection, controlling examination activities, presenting results.

Use Case 3: Content Writer- Two cases are related to Content Writer. These are write contents of the course and updating the contents as and when needed.
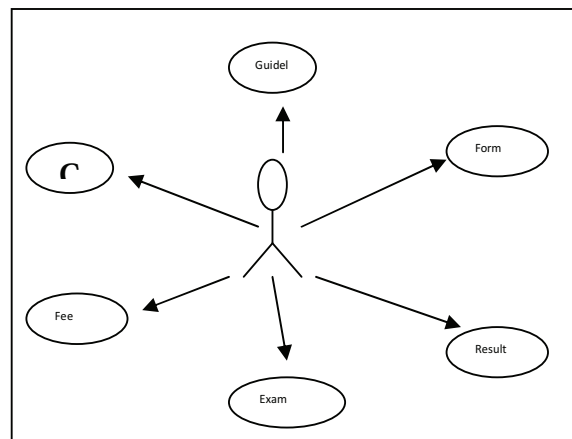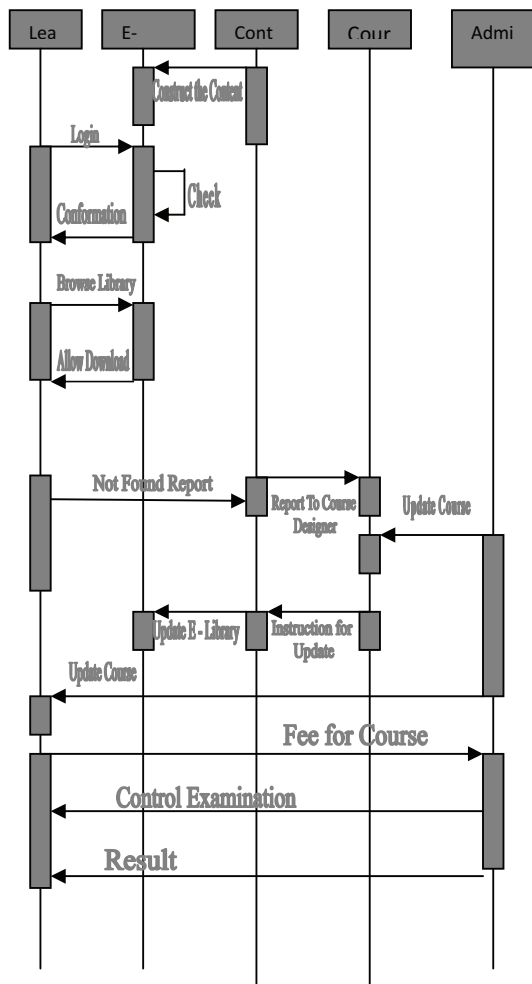

Use Case 2

Use Case 3

V. Sequence Diagram

Sequence Diagram demonstrates the dynamical behaviour of objects in the system in a use case by describing the communication among objects by message passing. In our proposed system content

VI. Conclusion:

E-Learning is an important component of E-Education and education for all is possible if e-Learning is implemented in distance education. O-O implementation of E-Learning is simple and easy to implement for software development point of view.

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writer constructs the contents of digital library. Learners log into the e-course library, login is verified and a confirmation is passed to the learners. Then learners can browse from the E-Library and access tutorial sessions. If a learner does not find the desired information, reports to the content writer. Then content writer communicates with course designer for update the library. Request may also come from administrative manager from time to time to the course designer for updating the library. Course designer then updates the course and instructs the content writer for updating. Content writer then updates the e-Library and reports to the designer.

Course designer reports to the Administrative Manager. Finally Administrative Manager informs the learners about updation.