Collaborative Web Design for E-learning

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Abstract-Hundreds of thousands of universities are today educating students with different methods for a vast variety of majors. This paper aims to introduce Knowledge Tree (KT) as an integrated virtual structure to be used in the educational systems. A collaborative structure is utilized to define a universal curriculum for various collages in Pune University to maximize e-learning capabilities. Then, a collaborative competitive approach is introduced to enrich the contents of course topics offered based on the mentioned structure. The results based on both educational facts fetched from the search engines and a questionnaire filled by a group of academics from different universities show that this system performs well in educational systems in terms of time, effort and cost. E-learning is the delivery of teaching material electronically with the added value of maintaining standards and quality without the limitation of a specific location. It involves the use of multimedia and is interactive. Multimedia includes more than one form of media such as text graphics, animation, audio and video conferencing. Interactivity (interactive learning) is a term that means a computer is used in the delivery of learning material in the context of education and training. In an interactive learning environment, a person can navigate through it, select relevant information, respond to questions using input devices such as a keyboard, mouse, touch screen, or voice command system, complete tasks, communicate with others, and receive assessment feedback.

Keywords-Finder and Provider, Parking Layout Design, Dynamic Fare Calculation.

I. INTRODUCTION

A soft error is a "glitch" in a semiconductor device. These According to previous research E-Learning will increase efficiency of academics. It involves Internet Technology as medium of various applications of an education system which integrate into a single system. The system infrastructure available to access and share the services for student and teachers are mobiles, digital assistance, tabs, laptops etc. It is well known fact that various applications of E-Learning are available such as Online Exam, Distance Learning, and Video Conferencing etc. To integrate them and make a single system which can accessible anywhere at any time through digital equipment like Smart phones, Tab, Computers.

The propose system has two types of approaches real-time approach and store-forward approach. In real-time approach all data processed online while store-forward approach data available offline. Online examination and Video conferencing using real-time approach and basic education system use store-forward approach.

The propose system has faced some technical challenges; these are student motivation, Course design, data storage and security. In Student motivation, E-Learning system has less face to face communication between student and teacher so to solve and analyze the problem of student is a difficult task for teachers. We need a more interactive means for studying. It is the educators' responsibility to allow them to choose new methods or ways of studying and guide them on most useful ways so that they learn fast and remember learned materials for a long time.

The percent of graduate students are increasing day by day. By this considering it career opportunity does not increase in the proportion of it. Students face many difficulties during start their career. Recently education system has focused on academic factors, but recruiters from organization want some extra factors from student rather than academics these are critical thinking, business intelligence, work ethics, communication skills, soft skills [1]. A student wants not only education, but also a job in the organization to stay in the competition. To achieve education and employment of student. E-Learning gives various key factors. The economic growth affects the educational institutes and family income does not increase in proportion of fees. Parents want to educate their children with stability and satisfaction in life. E-Learning offers educators clear, objective information about students' performance. These key factors are supplicant to academic education.

Propose E-learning system is interrogation of different educational applications. The client interacts with the system through a Graphical User Interface. For designing GUI, PHP code Igniter is used. HTML/CSS 3/Jquery is for designing user interfaces. Notepad++, Lime Editor, and Eclipse are editor' s use for developing the user interface. Wired or wireless connection will use to access application through GSM Module. Mysql database is used to store all

types of data specific application. The Apache server is used for updating on database runtime.

II. LITERATURE SURVEY

1 Theoretical Background

In this literature review section, we will present some ontology, semantic web and e-learning relevant research papers from which we could understand the importance of creating an ontology and how to design this ontology. There are different types of ontology language [2] for the semantic web. Many ontology languages have been developed, some of them are based on XML syntax while RDF and RDFS are languages created by the w3c working group. Two languages are built i.e. OIL and DAML+OIL. The strong point of their work is that they help developers find the most suitable language for their representation needs.

1.1 Standard-Based Education

Standard of process explain how learning process should align with defined learning structure in defined competency. It generates specific competencies into learning structure and scenario. In personalization, learning scenario should take into account learner's preference, ability, and character based on learner modeling. It also important that learning scenario enable adaptation process of the learning materialpersonalization to each individual learner [3].Standard of content defines scope of course and materials to be delivered based on competency and curriculum. It contains of standard of learning materials and activities that align to competency. It also become foundation of content repository development [4].

1.2 Personalization

In order to facilitate various way of learning, e-learning system can be enhanced with personalization. Personalized e-learning systems generate courses that are adapted to the learner's characteristics [5]. Personalization is commonly derived from selection and customization of learning content, learning activities and sequences of learning to readily suit the needs of particular learner[6]. Content, activities, and learning sequence can be varied for each learner according to learner's prior knowledge, competencies, and context[6]. Furthermore, [6] describe personalization as multiple activities and learning content that can be linked together by a learning sequence. To perform these tasks, personalized e-learning systems usually use several components such as learner model and pedagogical model.

1.3 Application Architecture

As John Zachman declared, "Architecture is that set of design artifacts, or descriptive representations, that are relevant for describing an object such that it can be produced to requirements (quality) as well as maintained over the period of its useful life (change)"[7]. Thus in the case of application, architecture would mean set of description that are appropriate to describe particular application. The objective of applications architecture is to ensure the application is manageable and meets the requirements. Application architecture describes the structure and behavior of applications being developed. Application architecture defines technological specification of solutions in support of the business. It provides a view on how services, module, and component should be bundled to support a business process [8].

2 Literature Survey

The IoT's is the potential impact of making education more relevant, engaging and motivating learners. However, to realize the benefits of connecting people, processes, data, and things, reliable connectivity and continuous access must be guaranteed. In the educational system, it requires training and disseminations of education, learner support, social mobilization, support services, quality assessment, planning and delivery oversight, inclusive education and curriculum policy, support and monitoring [1]. All these factors in a traditional education system are insufficient.

2.1 Schools In Ireland

One case study of top engineering schools in Ireland is described in [9] according to that the UCD Schools of Engineering are the top engineering schools in Ireland and their programmers are accredited for Chartered Engineer eligibility by Engineers Ireland and IChemE. Engineers are responsible for leading the way in finding solutions to real problems, in applying creativity to turn dreams into reality. UCD is an acknowledged leader in engineering studies internationally, providing a first-class education in a wide range of engineering disciplines. The program enables you to acquire skills in relevant areas of scientific research, technological development, product design and professional management in the lOT field. In the area of computer science, the challenge is in developing new forms of scalable education that accommodate large numbers of students around the world, attract potential students with various interests, and deliver an innovative curriculum that reflects the radical changes in computing technology [10].

2.2 WeFi Lab

The Paper [11] discuss WeFiLab (Web based Wi-Fi Laboratory). It is a virtual laboratory where students can access it any time anywhere. Laboratories are important part of science and engineering student and developing cost of it is more. WeFi Lab uses the structure of two-level operations to coordinate the communication between clients and wireless devices, allowing the students' experiment on real wirelessdevices [11]. The teacher maintains a schedule of student for accessing WeFi Lab. It improves student understanding and to help teacher weak areas of study.

2.3 Semantic Web

In e-learning domain [12] to design an e-learning system author deploy a semantic web. E-learning and knowledge are disparate from training and information respectively. The semantic web is a blessing for e-learning domain. The author puts in a nutshell variety of simple explanations of ontology and explains that for scholars the significant way for probing learning materials are content and context. The focus is on developing a semantic web foundation in e-learning system for the sports domain which include resource description framework, OWL and ontology model.

2.3 Historical Perception of Traditional Learning

Everyone in his or her life has experienced somehow traditional learning, the face to face learning. Traditional learning is an ancient method of learning that conducted by a teacher gathering students in places such as classes, labs or seminars to study and learn about different subjects. This method of learning has been practiced around the world in all levels such as kindergartens, primary, secondary, high schools, colleges and universities. In Traditional learning environment, teachers and professors have various teaching styles but the most popular traditional teaching style is teaching by telling [Schroeder (1993) quoted by Ebrahim Ali (2004)], Traditional learning method similar to any other method has its own advantages and disadvantages that are more or less similar in many cultures.

The traditional context of learning is experiencing a radical change. Teaching and learning are no longer restricted to traditional classrooms. It is obvious that in traditional learning the way teachers teach is very critical in students learning process. Delisle stated that it's how we teach, not what we teach that makes a lasting impact on our student [Smith (1990) quoted by Ebrahim Ali (2004)]. The strength of traditional classroom comes from face to face interaction among students and between students and instructors; this face to face interaction enables students to ask questions and make comments according to their understanding of the subject, allowing students to meet with other students in study groups and creating friendship between them that makes students more social. Some researchers argue that students generally want and need the access to the instructors, many times in a face to face environment, to ask questions and speak out their concerns. In traditional learning environment, instructors provide numerous opportunities to students during classes to ask questions or offer their opinions. In addition most instructors provide offices for students to stop by and chat, discuss problems and concerns. Like any other methods of learning, traditional learning has its strengths and weaknesses, one of the weaknesses of traditional learning or traditional class is that the numbers of students in the classrooms influence the performance of students. There are many researches on the factor of class size in student's performance. In 1960 Chant Royal Commission on Education in British Columbia reported that the size of the public school classrooms and teacher ratios were referred to in a number of briefings [that] invariably supported the view that class sizes should be reduced (Robertson and Kappan, 2005). According to the survey that was conducted in 2005 in the Ontario College amongst teachers and administrators, nine of ten teachers and administrators believed that reducing class sizes would have the greatest impact on improving student's achievements (Robertson and Kappan, 2005). Because the number of students in a classroom in a traditional learning affects the performance of the students in most primary and secondary schools; for students to get better results and to learn more effectively, the size of classrooms should be between 20- 30 students per classroom. In many colleges and universities also, when the size of classes is too big they are divided into two or more classes or taught by different lecturers to facilitate the students. However this reduction of classroom size is not always possible due to the limited number of qualified lecturers for particular subject and time limitation in colleges and universities. The other weakness of a traditional learning is that, the students need to travel to institutions during day, a few days a week. Depending on location of the classroom and time becomes inaccessible sometimes. Therefore to solve this issue the new learning method is called e-learning and also known better as distance learning. It has been enabled students to learn regardless of time and their location. Traditional Learning advantages and disadvantages is discussed below.

Advantages:-

➢ Immediate Feedback
➢ Being Familiar To Instructors And Students
➢ Motivating Students

   ➢   Cultivation of Social Community

Disadvantages:-

   ➢   Instructor-Centered
   ➢   Time And Location Constraints
   ➢   More Expensive To Deliver

2.4 New Learning Models

The quality of traditional learning always influences the size of classrooms (number of students) and knowledge of lecturers, its boundary to the time and location are the other weaknesses of traditional learning. With today's world population increasing, the people's trend to study is rapidly growing; education environments are changing and universities are looking to reach more and more students who bring them more marketing. Nowadays many college and university students are married, have children, involved in part time or full time jobs and other responsibilities to follow in their lives, the size of cities are growing and many students are living far distance from college and universities. The need of new learning method becomes really necessary to facilitate today's students learning and educational trends. The growth of the internet and its impact on education system has created a new learning model called e-learning that is considered as a new revolution in the world of education; e-learning refers to the type of learning that people take a professional or educational course without the use of traditional methods; taking a course or going to school remotely, using the web as a classroom. The purposes of study and education e-learning or electronic learning refers to the delivery of educational material via any electronic media such as internet, intranet, extranets, satellite broadcast, audio/video tape, CDs and computer-based training. E-Learning currently is a one of the popular models of learning, like any other idea it has its own advantages and disadvantages. The most important advantages of e-leaning are that participants can access programs anywhere at any time compared to the traditional learning students who are bounded to the time and location. Although e-Learning is becoming more widely spread for education and training still many online courses are poorly designed. Some are little more than electronic versions of paper-based materials; overall the reputation of online courses is not good and the exception of well-designed course that effectively teach a topic to its target students is high (Neal et. al., 2004). The most important strengths of e-learning courses for students comes from its indecency to the time and unbound to location, beside that, the number of students in virtual classrooms is not an issue since e-leaning courses are student oriented compared to traditional learning courses that are instructor oriented. Some researchers believe that interaction is an important element in learning Vygotsky, (1978), quoted by Hay et. al. (2004), was Indeed, interaction has been

proposed as one of the key parts of any learning experience, some other researchers suggest that on-line education adversely affects interaction, therefore lowering the quality of the educational experience (Abrahamson, 1998; Rahm and Reed, 1997; Sonner 1999, Hay et. al., 2004). Further studies on-line learning indicated that dissatisfaction with online courses resulting from feelings of isolation and lack of interaction with students and instructors (Hay et. al., 2004). According to Labay and comm (2003) e-learning produces the better learning outcomes than the traditional methods. The Internet and the World-Wide-Web have become the predominant media for distance education offering degrees at bachelor's, master's, and doctorate levels. Below is given the advantages and disadvantages of e-learning.

Advantages: -

   ➢   Learner-Centered
   ➢   Self-Paced
   ➢   Cost-Effective For Learners
   ➢   Potentially Available For Global Audience
   ➢   Unlimited Access To Knowledge
   ➢   Archival Capability For Knowledge Reuse And Sharing

Disadvantages: -

   ➢   Lack Of Immediate Feedback In Asynchronous E-Learning
   ➢   Increased Prepration Time For Instructor
   ➢   Not Comfortable To Some People
   ➢   Potentially more frustration, anxiety and confusion

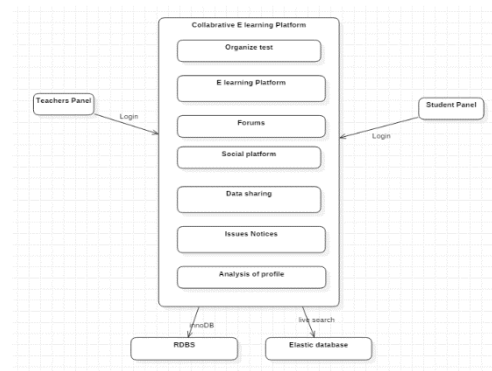### III. SYSTEM MODEL

A. System Architecture

Fig 1 Block Diagram

A diagram showing in schematic form the general arrangement of the parts or components of a complex system

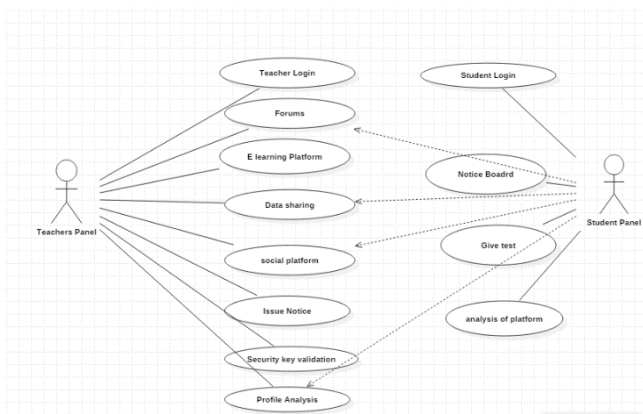or process, such as an industrial apparatus or an electronic circuit.

Fig 2 Use Case Diagram

Use Case Diagrms- Use case diagrams are usually referred to as behavior diagrams used to describe a set of actions (use cases) that some system or systems (subject) should or can perform in collaboration with one or more external users of the system (actors).
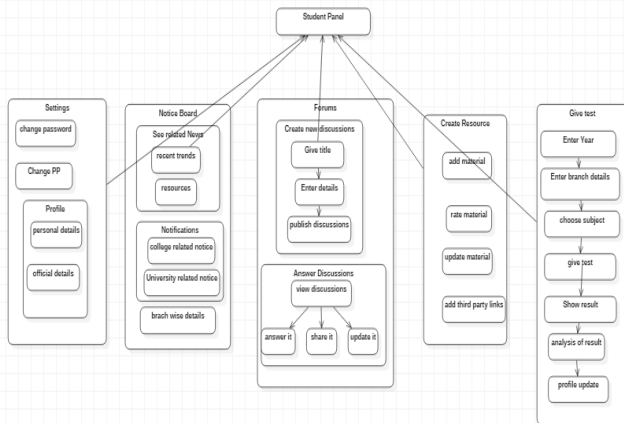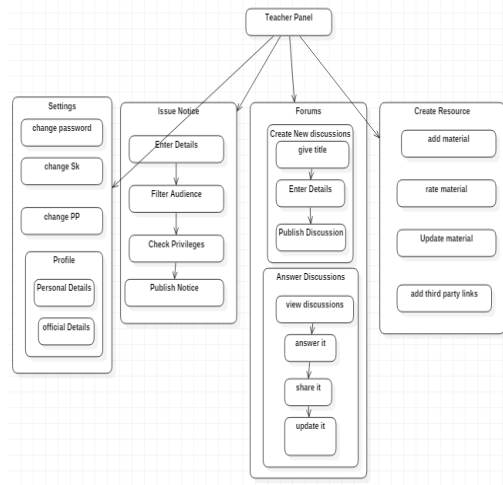

Fig.3 Student panel State Diagram

Fig.4 Teacher Panel State Diagram

Suppose you intend to learn "Quick Sort" as one of the subjects of the "Data Structure" course of software engineering programs. You have to start from the root of the tree and follow the right path through many options to find it. In order to reach this topic, you may select path in this order: Engineering, Computer Engineering, Software, Data Structures and then Quick Sort. In fact, there will be a list of different sort methods in the previous level from which you can select Quick Sort (Fig 5). In fact, these items are examples of final structures as Leaves in the Knowledge Tree and will be offered as course subsections namely topics.
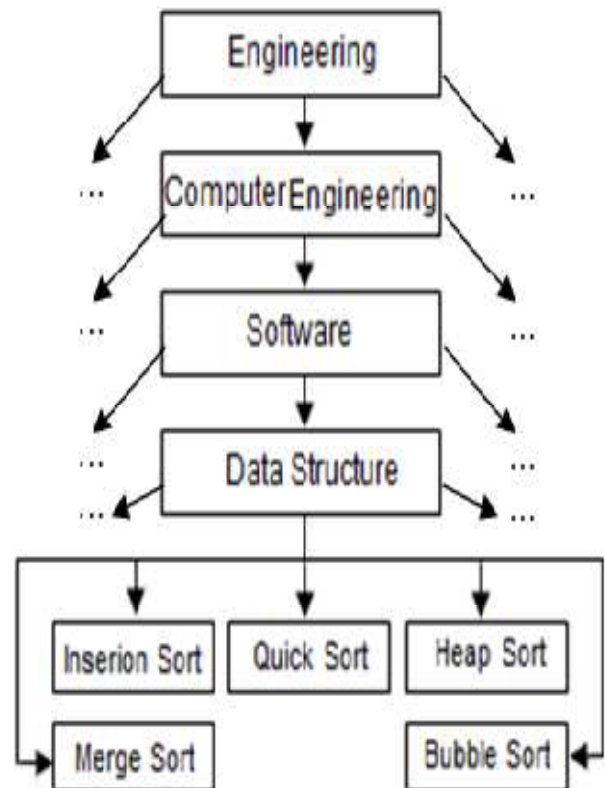

Fig5 Path and Final Topics

The structure of the Knowledge Tree on each leaf points to an ordered set of useful resources about that topic (Fig 6). These resources are one of the main subjects of this paper and will be discussed later in this context. The contents provided for each topic in the Knowledge Tree have to be considerable resources for that topic. Topics may refer to texts, presentation slides, pictures, films and other types of digital media file that should be kept on a gigantic database. There will be huge amounts of data; thus, large data centers will be needed to save them. These are to be referred to as the main resources for teaching or studying each topic. So any remarkable piece of information needed for studying or teaching a curriculum material is accessible from part of our Knowledge Tree.
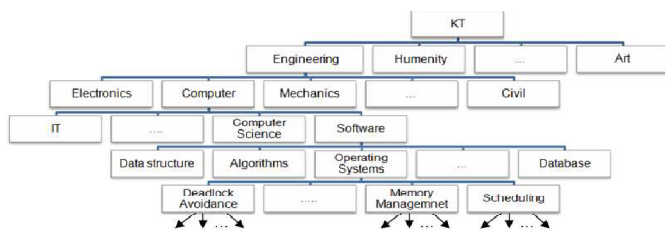

Fig 6 Knowledge Tree

IV. CONCLUSION

Today, the academic world has reached the conclusion that they need universal references for education to improve the quality and the maximize quantity of educational programs. Although some different books are offered by different universities as main references to guide students to go through the right path to learning, there is no global knowledge reference categorizing all fields of knowledge. Besides, despite the fact that books and e-books are good references for further studies, they cannot offer complete e-learning capabilities. Students usually do not interact with them easily and key concepts may be neglected. Furthermore, the appropriate curriculum along with enough resources and expert teaching skills are less completely assembled together or at least expensive to establish. These resources are now provided and customized locally. As a result, many aspects or subjects remain neglected in university curriculums, even in the top universities. Using Knowledge Tree, a sort of globalization helps universities to both develop e-learning capabilities of their offered courses and use appropriate curriculum with enough educational resources. This is useful especially in developing countries. One of the advantages of this system is gathering top professors and presenters together in all fields and giving them the chance of getting acquainted. The teaching methods for each topic are then accessible for all professors and students.

REFERENCES

[1] Sanjeev Wagh, Ramajee Prasad," Internet of Things: An Architectural Approach for Teaching Learning Process in Educational System",cElsevier journal ofICRTET (608), 2014.

[2] A. Gomez-Perez and O. Corcho, "Ontology Languages for the Semantic Web," IEEE Intelligent Systems, vol.17, no.1, pp.54-60, Jan./Feb. 2002.

[3] S. A. Gamalel-din, "An Intelligent eTutor-Student Adaptive Interaction Framework," in ACM INTERACCION '12 Proceedings of the 13th International Conference on Interacción Persona-Ordenador, 2012.

[4] I. Rytikova and M. Boicu, "A Methodology for Personalized Competency-based Learning in Undergraduate Courses," in ACM 15th Annual Conference of Information Technology Education, 2014

[5] S. Ghallabi, F. Essalmi, M. Jemni, and Kinshuk, "Toward the reuse of E-Learning personalization systems," in IEEE 2013 Fourth International Conference on Information and Communication Technology and Accessibility (ICTA), 2013.

[6] I. O. Keeffe, A. Staikopoulos, R. Rafter, E. Walsh, B. Yousuf, O. Conlan, V. Wade, and I. Okeeffe, "Personalized Activity Based eLearning," in ACM Proceedings of the 12th International Conference on Knowledge Management and Knowledge Technologies, 2012.

[7] J. A. Zachman, "Enterprise Architecture_: The Issue of the Century," Database Programming and Design Magazine, 1996.

[8] S. Aziz, T. Obitz, R. Modi, and S. Sarkar, "Enterprise Architecture_: A Governance Framework," 2005.

[9] Orla Feely, "BE the Internet of Things (loT) School of Electrical, Electronic and Communications engineering", Beijing-Dublin International college at BJUT, 2007.K. Elissa, 'Title of paper if known," unpublished.

[10] Michelle Selinger, Ana Sepulveda, Jim Buchan, White paper,"Education and the Internet of Everything", Cisco Consulting Services EMEAR Educational Team, October 2013.

[11] Lin Cui, Fung Po Tso, Di Yao, and Weijia Jia, "WeFiLab: A WebBasedWiFi Laboratory Platform for Wireless Networking Education", IEEE Transaction on Learning Technologies, Vol 5, NO.4, October/December (2012)

[12] Y.A. Alsultanny, "E-Learning System Overview based on Semantic Web," The Electronic journal of e-learning, vol.4, no.2, pp.111-118, 2006.