A TECHNICAL SURVEY ON E-LEARNING APPROACHES

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ABSTRACT

Education is a means of empower the lives and future within workplace. Number of the new technologies have made great impact on learning and education. Internet has shown new paths to learning. Internet usage has been rising steadily, with a growing number of Internet users. People of all ages are becoming more and more familiar with the Internet. The educational resources are accessible to students. Learner needs are increasingly as continuous throughout the working life. E-learning is an opportunity to raise the bar and move forward-learning is an opportunity to make more effective use of scarce resources [1]. In India, e-Learning systems and online courses has already been started. This paper, discuss about E-Learning and their different approaches. Each approach have represent their own Knowledge Base(KB),which are helpful to utilize the knowledge and learning concepts as worldwide via the internet, intranet/extranet, audio or video tape, satellite TV, and CD-ROM.E-learning systems, which are made up through knowledge base, enable the students to extend their learning beyond the borders of the classroom by using various technologies.

Keywords- Multimedia KB, KB-NLP, multilinguistic, virtual learning environment, virtual classroom.

Introduction:

E-learning systems are advanced systems that are used to improve students' learning capabilities as well as their accessibility by utilizing information and communication technology tools. These systems usually involve activities to increase the interaction among students and between instructors and students. E-learning systems enable students to extend their learning beyond the borders of the classroom by using various technologies. Education has evolved from a material based process where the instructor (teacher) focused on presenting information to students with no regard to the differences in their learning capabilities, and on the other side, student had the role of a receiver, to a learner (student) centered process where students are able to learn at their own pace, and the instructor role changed to being a mentor guiding students to acquire knowledge and improve their learning skills. In addition, the rapid evolution and growth of information and communications technologies (ICT) has lead the development of new services and applications that created value in almost every aspect of life. Education fields have witnessed major development because of ICT services and applications. E-learning systems are educational systems that utilize ICT resources including Internet, computer networks, multimedia and other resources to enhance the learning process and provide students with the necessary tools to acquire knowledge and professional experiences. There are many approaches to implement e-learning systems which enables students in different continents to obtain graduate and post graduate degrees remotely and with no need for attending lectures physically. In addition e-learning systems can also be used in conjunction with traditional learning (blended or integrated learning) to expand the resources available for students, and help them focus on their learning objectives.

E-Learning Approaches:

There are number of e-learning approaches are available. In this paper we will discuss the various approaches.

1. Mutimedia Knowledgebase E-learning Approach

Representation of knowledge and learning materials in a computer-based system must be done effectively and efficiently to facilitate the learning process. In e-learning systems, it is important to provide strong support for lecturers to develop lessons in order to improve the quality of the lessons and reduce the cost of repetitive tasks. However, the lessons should be easily retrievable by students so as not to disrupt the learning process.Initial research of Virtual Learning Environment architecture has been adapted into the current MKBe-Learning environment [2]. It is a computer-based interactive environment that supports the process of learning and teaching university courses and combines functional blocks to provide facilities for students to learn a university course, either on their own or with the assistance from lecturers or instructors. Fig. 1

illustrates the different 'layers' of the environment. The lowest layers consist of a collection of media such as image, text, video, audio, animation, etc. The 2nd layer is the knowledge base here concepts are organized using object-oriented approach while the 3rd layer uses the knowledge base to structure courses and lectures and it also deals with the management of the course as a whole. The top layer is the user interface. The MKB e-Learning System [3] is an integrated E-learning system consisting of intelligent interface, inference engine, presentation generator, authoring tool, knowledge base and learning management system.
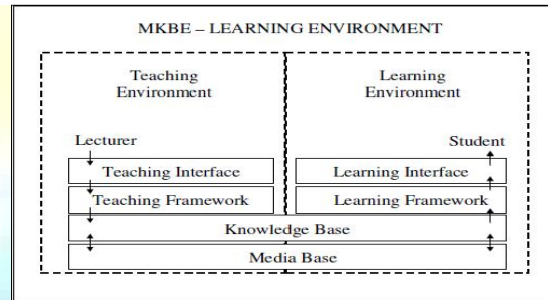

Fig:1 MKB e- Learning Environment

The components and their relationship are shown in Fig. 2

The major components of the system are:

- Intelligent Interface that provides access to modules, lectures, concepts and medium.

- Inference engine that personalize the learning process according to the specific needs of students.

- Presentation generator that creates the multimedia presentations for students based on personalization parameters from the   inference engine.

- Authoring tool that provides facilities for lecturers to create learning modules to be

presented to students.

- Knowledge base that forms a reusable storage of concepts to be learnt by students and to be prepared by lecturers.

- Learning Management System that maintains personal details of students and
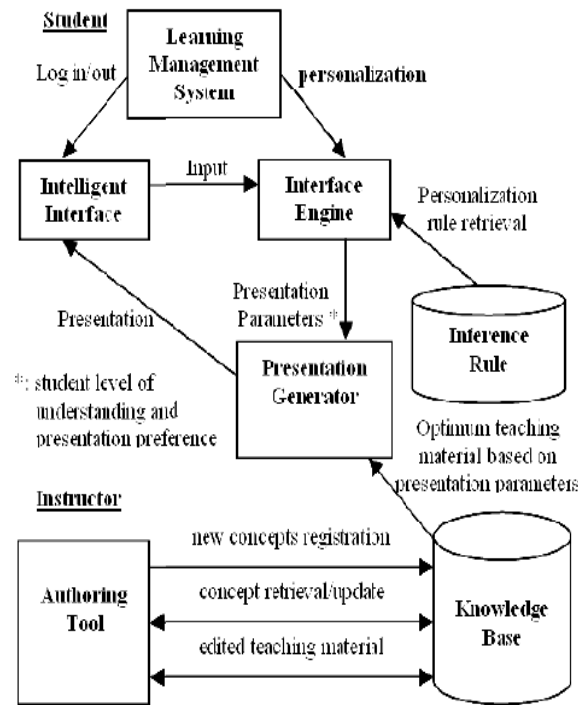
records of their learning process.

Fig:2 MKB e -Learning System

The MKB e-Learning System is a multimedia e-learning system created to store, manage and retrieve concept-based multimedia education material. With multimedia content, the learning process can be stimulating and engaging. Students will access the course materials using the system either for synchronous or asynchronous lectures while lecturers will use it to organize and store education materials such as tutorials, lectures, animations, videos, etc. The multimedia technology has played an important role as basic demand of the e-learning market. Thus, the solution for multimedia interactivity and fast content development are imperative to e-Learning developers. Significantly shorten the time for developing content that is now perceived as one of the greatest obstacles to broader the dissemination of e-Learning.

2. Natural Language processing Knowledge base E-learning Approach

People use natural languages, such as English, to communicate. There are several good reasons for getting computers involved in that process. The one important reason is that reason there is an abundance of natural language material. Computers are useful tools for organizing that material, retrieving it, and translating it into other languages. The other is that people need to communicate with machines and people find natural languages. So NLP approach is use in the E-learning systems. Natural Language Processing (NLP) is the use of computers to understand human (natural) languages such as English. "to understand" means that the computer can recognize and use information expressed in a human language .The structure of a human

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language contain five levels: Phonology (sound), Morphology (word formation), Syntax (sentence structure), Semantics (meaning) and Pragmatics (use of language in context). A large variety of information processing applications deal with natural language texts.Many such applications require extracting and processing the meanings of the texts, in addition to processing their surface forms. For example, applications such as intelligent information access, automatic document classification, and machine translation benefit greatly by having access to the underlying meaning of a text. In order to extract and manipulate text meanings, a natural language processing (NLP) system must available to it a significant amount of knowledge .The knowledge-based approach to NLP concerns itself with methods for acquiring and representing such knowledge and for applying the knowledge to solve well-known problems in NLP such as ambiguity resolution[5]. A natural language text can be viewed as a set of cues to the meaning conveyed by the text, where the cues are structured according to the rules and conventions of that natural language and the style of its authors. Such cues include the words in a language, their inflections, the order in which they appear in a text, punctuation, and so on. It is well known that such cues do not normally specify a direct mapping to a unique meaning. Instead, they suggest many possible meanings for a given text with various ambiguities and gaps. In order to extract the most appropriate meaning of an input text, the NLP system must put to use several types of knowledge including knowledge of the natural language, of the domain of discourse, and of the world in general[6]. Every NLP system, even a connectionist or ''purely'' statistical one, uses at least some knowledge of the natural language in question. Knowledge of the rules according to which the meaning cues in the text are structured (such as grammatical and semantic knowledge of the language) is used by practically every NLP system. The term Knowledge-Based NLP System (KB-NLP) is applied in particular to those systems that, in addition to using linguistic knowledge, also rely on explicitly formulated domain or world knowledge to solve typical problems in NLP such as ambiguity resolution and inferencing.

The Processing Components of KBNL are :

1.Lucy is a knowledge-based English understanding system.

2.Koko is a knowledge-based English generation system.

3.Luke is a lexical acquisition tool that exploits regularities in the way language relates to a knowledge base to assist in building a robust lexicon (dictionary) that can be used by Lucy and Koko.

KBNL is intended to be a complete language processing system for typewritten English. It is composed of a set of processing components and a set of knowledge bases that those components use.

Knowledge-based have influenced the field of NLP in significant ways providing a viable alternative to approaches based only on grammars and other linguistic information. In particular, knowledge-based systems have made it possible to integrate NLP systems with other knowledge-based AI systems such as those for problem solving, engineering design, and reasoning [9].Efforts at such integration have moved the focus away fromnatural language front-ends to more tightly coupled systems where NLP and other tasks interact with and aid each other significantly.KB-NLP systems have provided a means for these AI systems to be grounded in real-world input and output in the form of natural languages. KB-NLP systems have also brought to focus a range of applications that involve NLP of more than one natural language. Knowledge-based systems are particularly desirable in tasks involving multi-lingual processing such as machine translation, multilingual database query, information access, or multilingual summarization. Since linguistic knowledge tends to differ in significant ways from one language to another, such systems, especially those that deal with more than two languages, benefit greatly by having a common, interlingua representation of the meanings of texts. Deriving and manipulating such language-independent meaning representations go hand in hand with the knowledge-based approach to NLP [12]. NLP can be construed as a search task where the different possible meanings of words (or phrases) and the different ways in which those meanings can be composed with each other define the combinatory of the space. All knowledge-based systems can be viewed as search systems that use different types of knowledge to constrain the search space and make the search for an optimal or acceptable solution more efficient. In designing a KB-NLP system one must first determine how to represent the meanings of texts. Once such a meaning representation is designed, knowledge about the world, meanings of words in a language, and meanings of texts can all be expressed in well-formed representations built upon the common meaning representation [10].Knowledge in KB-NLP systems is typically partitioned into a lexical knowledge base and a world KB. A lexical KB typically contains linguistic knowledge, such as word meanings, the syntactic patterns in which they occur, and special usage and idiosyncratic information, organized around the words in the language. It is, in general, a good practice to keep language specific knowledge in the lexical KB and domain or world knowledge in a separate world KB which is sometimes also called ontology, especially in multilingual systems. In such a design, the world KB can be common across all the natural languages being processed and can also be shared potentially with other knowledge-based AI systems.
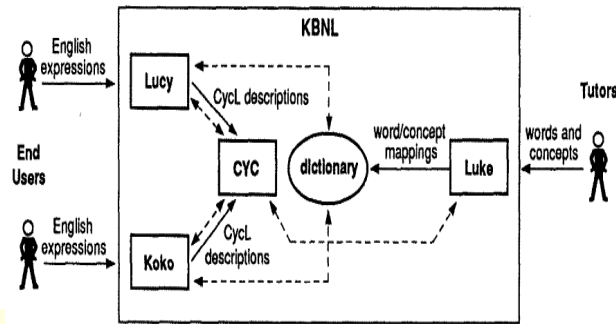
Fig:3 The components of KBNL

3. Virtual Learning Environment E-Learning Approach

The other important e-learning approach with is used now a days is VLE (Virtual Learning Environment). It is a software system developed to facilitate teachers in the management of various higher educational courses. It is a virtual environment for learning where only the environment is 'virtual' and the learning is like any other classroom education [4]. Many VLEs are placed on a web server. A VLE might use PHP as its web language/program, with MySQL as a database. These systems usually run on servers and the course is shown through internet pages to the students. Templates for content pages, discussion forums, chat, quizzes and exercises with multiple-choices are all part of such a system. New features in these systems include blogs and RSS. Services generally provided include access control, provision of e-learning content, communication tools and administration of the user groups. A concept of Virtual learning System that has developed as a result of improved technology is the virtual classroom. The virtual classroom has become a reality due to the availability of broadband internet through mobile data cards or mobile phones. Busy executives can now attend live two way programs on their laptops or offices without having to travel to an academic campus. Similarly, faculty can teach in a virtual classroom over a web camera and phone from the comfort of their offices. A typical virtual classroom session involves the professor explaining the concepts on slides with the participant listening on headphones. Both the professor and the slides are seen on the computer screen by the participant who can ask questions on a separate chat window. Virtual classrooms draw the best faculty from across institutes in India and abroad. Virtual classrooms present viable and lucrative training options for corporate houses. They can impart new skills to their employees at various locations at the same time, saving time and cost. To implement the concept of virtual class room there are two most basic arrangements : Instructor to a Classroom and Instructor to a Group of Geographically Dispersed Students[8].Arrangements that are more complex may include a combination of the a local classroom from which the instructor delivers the class to both local and remote students. Fig. 4: shows the topology of Instructor to a Classroom setup and Fig. 5 shows the topology when the students, instead of being gathered in

one of few classrooms, they can attend the class from individual workstations located at random places two basic topologies and, possibly.
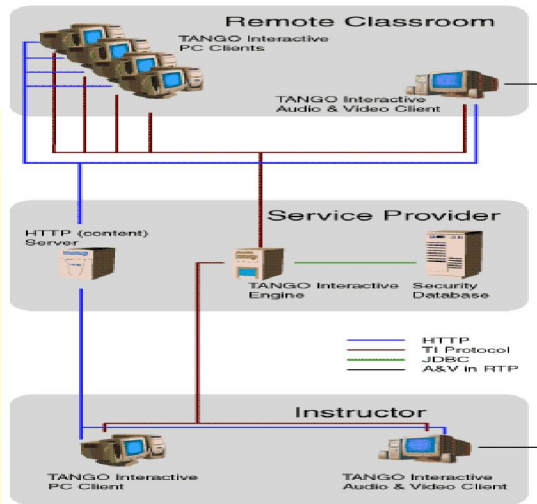

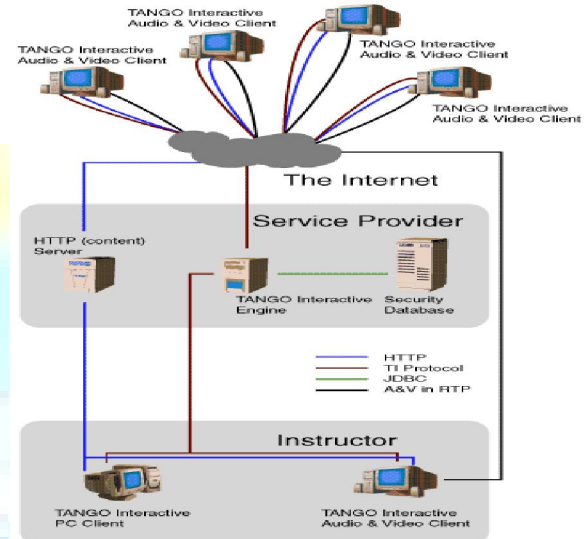
Fig:4 Instructor to a Classroom setup   Fig:5 Students located at different places

Conclusion:

E-Learning systems have an important role in many areas. It has various benefits as it eliminates wasted time and money, condense training which allows participants to focus on the information they really need, improve consistency and effectiveness which makes sure that all of your trainees are getting consistent instruction that is easy to document, evaluate learning retention which provides built-in measurement of employee knowledge. Both pre- and post-assessments can be incorporated into any program, provide risk-free simulations which can simulate real-life situations, so you can train your employees how to use complex software or handle touchy situations in a risk-free environment. Any Approach discussed in this paper can be used.

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