

A Proposed Architecture for E-learning System to Address Learner's Psychology

Pranay S. Mahajan

Rahul R. Ingole

Dr.S.P.Deshpande

Abstract: Although there has been more research on E-learning in educational domain, but less or more has been written about E-learning. E-learning system has great enhance on modern IT industry. An E-learning system should present personalized optimal content to user anytime and anywhere and encourage collaborative learning. Therefore there is a need to modify and redesign the educational system to meet the needs more efficient as well as better, this paper introduces the current E-learning systems and then analyses the learner behaviour and psychology and describes the architecture of E-learning which is based on psychology of learner. Psychology is a scientific study of human mind and behaviour. Educational Psychology is the application of psych & psychological principles, methods to study of human development, motivation, instruction, assessment and related issues that influence the interaction of teaching & learning. We have tried to introduce E-learning system based on learner psychology and make an active research and exploration for it from the following aspects architecture, learner behaviour and psychology, construction methods and interface with system.

Keywords: E-learning, learner psychology, architecture, behaviour.

I. INTRODUCTION

At current personalized learning services is the key point in the field of online learning as there is no fixed learning path which appropriate for all learners. However traditional learning systems ignore these services requirements and deliver the same learning content to all learners. This approach may not be effective for learners with different psychology and abilities. Ability refers to how well someone can do something and Style refers to how someone likes to do something. No two persons are exactly alike in ability, typical behaviour and psychology. Accordingly in this paper we propose a behavioural and psychological based modelling technique to designing an effective and improved e-learning system in which learner knowledge, abilities, learning style, behaviour and preferences are considered in the learning process. In this system user profile is updated based on the abilities that learner achieved.

II. RELATED WORK

Mahmoud Neji and Mohamed Ben Ammar [1] Had proposed the architecture of agent-based collaborative for effective e-learning. It analyse the concept of communication in virtual environment and explore the capacity of virtual environments to communicate affective state, i.e. those aspects of communication concerned with emotional response.

By analysing the concept of VEs and described the framework for e-learning i.e. Agent-based collaborative e-learning by combining the feature of VEs and e-learning.

Hong M. and Cho D [2] presented a conceptual ubiquitous learning architecture based on a context- aware manager. This ontology-based context model is called CALA-ONT (Context Aware Learning Architecture Ontology) which supports user centric ubiquitous learning services. It consists of four top- level classes and sub-classes, and contains twelve main properties which describe the relations between individuals in top level class and its sub properties.

C. Pahl. [3] Had proposed the content driven architecture of e-learning. It analyse the concept of content driven design and describe the architecture by combining feature of e-learning and content driven design to developed framework for effective e-learning system.

F. P. Rokou et al. [4] distinguished three basic levels in every web-based application: the Web character of the program, the pedagogical background, and the personalized management of the learning material. They defined a web-based program as an information system that contains a Web server, a network, a communication protocol like HTTP, and a browser in which data supplied by users act on the system's status and cause changes. The pedagogical background means the educational model that is used in combination with pedagogical goals set by the instructor. The personalized management of the learning materials means the set of rules and mechanisms that are used to select learning materials based on the student's characteristics, the educational objectives, the teaching model, and the available media.

Many works have combined and integrated these three factors in e-learning systems, leading to several standardization projects. Some projects have focused on determining the standard architecture and format for learning environments, such as IEEE Learning Technology Systems Architecture (LTSC), Instructional Management Systems (IMS), and Sharable Content Object Reference Model (SCORM). IMS and SCORM define and deliver XML-based interoperable specifications for exchanging and sequencing learning contents, i.e., learning objects, among many heterogeneous e-learning systems. They mainly focus on the standardization of learning and teaching methods as well as on the modelling of how the systems manage interoperating educational data relevant to the educational process [5].

IMS and SCORM have announced their content packaging model and sequencing model, respectively. The key technologies behind these models are the content package, activity tree, learning activities, sequencing rules, and

navigation model. Their sequencing models define a method for representing the intended behaviour of an authored learning experience, and their navigation models describe how the learner and system initiated navigation events can be triggered and processed. Recently, researchers in computer science have acknowledged that models of emotions presented by psychologist are very useful to variety of computerized applications such as: personal assistance application, intelligent interfaces [6], intelligent tutoring systems, etc.

Reilly and Bates, within the OZ project, create an environment for simulating believable emotional and social agents; each agent has a set of goals trying to achieve. Based on the event-appraisal model of Ortony et al., these agents are able to express emotions after evaluating the impact of an event on the agent's goals [7]. Many researches in this domain are still trying to make the content representation standard. They are trying to make the learning style more powerful from the learner's point of view which is more important area of research where learner's preferred pace is getting more interest than other areas.

III. PROBLEM DEFINITION

E-learning is combination of advance technology and learning services which provide us high value integrated learning anytime, anywhere but not everyone. By analysing previous e-learning systems, most of the e-learning systems only deliver learning content, as there is no every learner has same psychology, learning style and ability so most of e-learning systems not much effective in online learning context. In this paper we have proposed effective e-learning framework based on learner psychology, style and attitude learning. Learner can actively interact with e-learning system. The use of learner ability and psychology is more beneficial to communicate with e-learning system. The design of architecture includes technological components as well as interactive components. Depends on computers, flexibility of e-learning course and the quality of e-learning course, its apparent usefulness, the apparent easiness of use, and the variety in assessments are critical factors affecting learner satisfaction. Learner's want a program that is easily navigable, and one in which they can have access to feedback from the instructor and other learner's.

IV. ARCHITECTURE OF E-LEARNING SYSTEM

Overview:

Mainly, the number of people is interacting in an E-learning system, i.e. learners, authors, administrators, trainers. Authors and learners are main parties. In traditional E-learning system, there is not focus on learner psychology and ability. In our proposed architecture introduce a new model which analyse the learner psychology and ability of learning. Therefore, the E-learning systems with its architecture are more effective, flexible and can be enhance wherever required. As shown in figure, the proposed E-learning system architecture contains several basic modules as follows.

Login module: User login module. Once the user login to the system, it will search the user profile in database then navigate to user agent.

User Agent: React to login module and activate other module, the user agent will decide whether to communicate.

Search module: this module use for searching proper content according to learner.

Content Management module: This module can communicate with the content providers or the authoring service, and then take responsibility of content transferring.

Content Module: It determines what types of content should be provided to user based on user information, and Provide the information to the user agent to record the user state.

Authoring module: This module informs authors to develop the learning content and transferring content to content management module.

Delivery module: The delivery module will deliver the proper content to the user.

Other module: Other module is assisting module for E-learning systems.

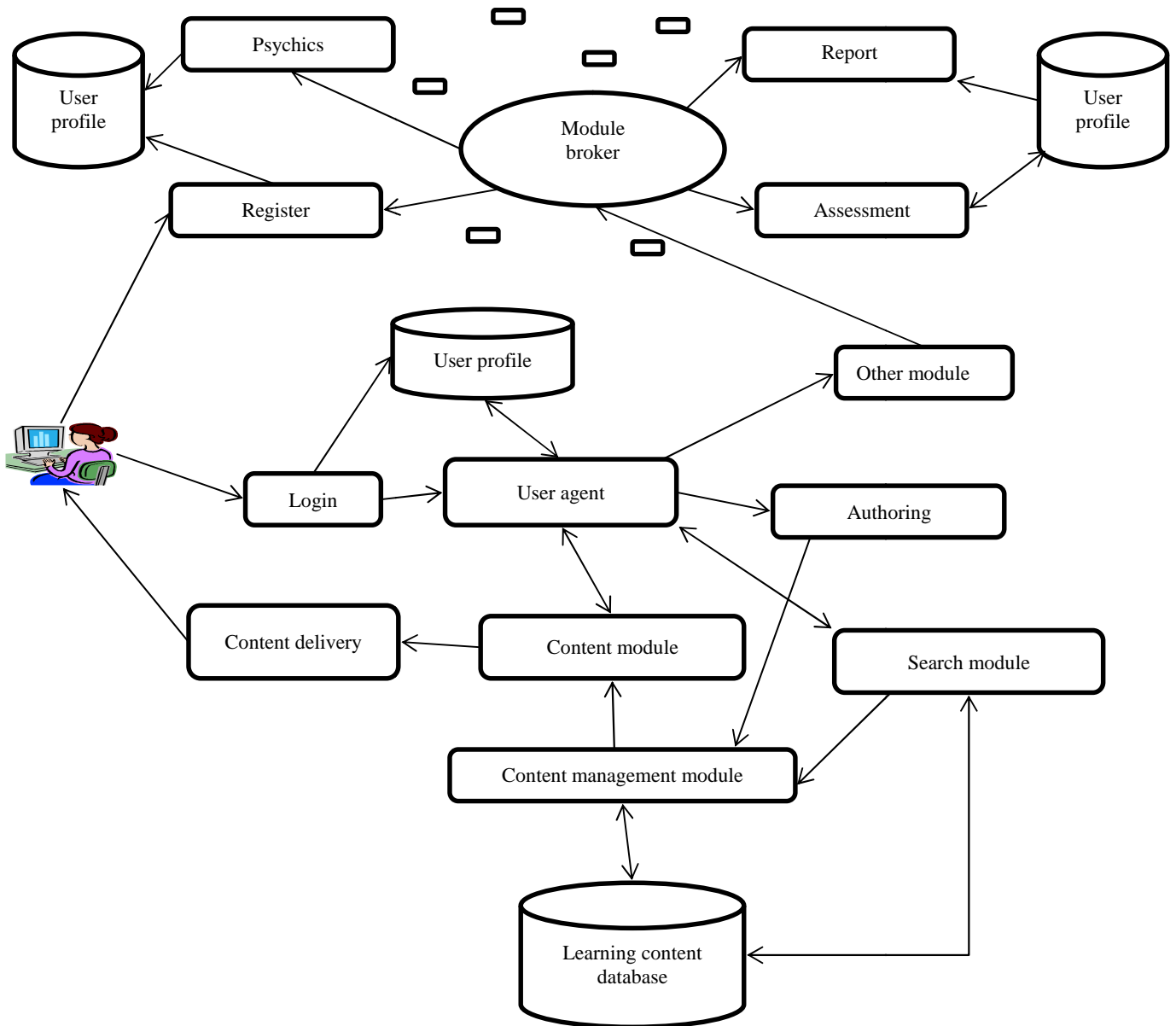


Fig 1: Architecture of E-learning System

As described in figure 1, user will login in the system. If user is valid then it will be navigated to user agent. User agent will take charge of user from user profile then user agent will invoked the psychic's module to record user psychology, learning style, and ability toward learning and it will update the user profile. It will be activated to search module. Search module find the related content from content database, if found then it will be return true value then the user agent send

necessary information to content management module, in the module retrieve content from the database by using user information, and this learning content moves to the content module this module customize that content according to the learner personal psychics state which is recorded and that content send to content delivery module and this module serves content to learner.

CONCLUSION

E-learning is new area in field of educational domain and training market, its challenging task to implementing the undergoing technological changes and development in E-learning. As we proposed E-learning framework based on learner psychology, the psychological analysis reveals different states (confusion, satisfaction, confidence) of learner and attitude towards learning, these states and attitude are more precise in an educational domain.

REFERENCE

- [1] Mahmoud Neji and Mohamed Ben Ammar "Agent-based Collaborative Affective e-Learning Framework" The Electronic Journal of e-Learning, ISSN 1479-4403, 2007.
- [2] Hong M. and Cho D. "Ontology Context Model for Context-Aware Learning Service in Ubiquitous Learning Environments" international journal of computers Issue 3, Volume 2, 2008, pp. 193-200.
- [3] C. Pahl. [3] "content driven design and architecture of E-learning applications" Advanced Technology for Learning, Vol. 5, No. 1, 2008.
- [4] F. P. Rokou et al., "Modeling web-based educational systems: process design teaching model," Educational Technology and Society, Vol. 7, pp. 42-50, 2004.
- [5] H. Adelsberger et al., "The Essen model: a step towards a standard learning process," <http://citeseer.ist.psu.edu/515384.html>, 2003.
- [6] Seif El-Nasr, M. Ioerger, T. Yen, J. PETEEI: A PET with Evolving Emotional Intelligence. Autonomous Agents'99, 1999.
- [7] Reilly, W. S. and Bates, J. Building emotional agents. Pittsburg, PA: Carnegie Mellon University, Technical Report CMU-CS-92-143, 1992.
- [8] Wei, X. & Yan, J. (2009). "An e-learning system architecture based on web services and intelligent agents" International Conference on Hybrid Intelligent Systems - Volume 2 (pp. 173-177). Shenyang, China: IEEE.

AUTHOR'S PROFILE



Pranay S. Mahajan received his PGDCS in computer science and BCA in Computer Application from SGB Amravati University. Presently student of MSc in Computer Science from HVPM an autonomous college, Amravati.



Rahul R. Ingole received his PGDCS in computer science and BCA in Computer Application from SGB Amravati University. Presently student of MSc in Computer Science from HVPM an autonomous college, Amravati.



Dr. S. P. Deshpande is currently working as Associate Professor for MCA at P. G. Dept. of Computer Sc. And Technology, DCPE, HVPM, Amravati, India. He did MCA and M.Sc.(Phy), Ph.D. in Computer Science and Engineering. He has published number of research papers in National and International Conference. His area of interest includes Software Engineering, Data base, Data Warehousing and Data Mining