International Journal of Enhanced Research in Science Technology & Engineering, ISSN: 2319-7463
Vol. 2 Issue 5, May-2013, pp: (24-28), Available online at: www.erpublications.com

Importance Applications Mobile Agent technology for Virtual E-learning Environment: Proposed Model

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Abstract: In current era Mobile Agent (MA) technology is engaging so much attention as an urgent request. Many applications for Mobile Agent goes via the web like commercial transaction, sale room, and job finder, etc.. Mobile Agent Technology may contribute in solving many problems for several companies because Mobile agent technology is a very appealing solution for this kind of problem. Of later E-learning attracts most recent technologies seeks to model and to display the most perfect and suitable solution to cover the majority of the processes needed in its web_based virtual environment. Mobile Agent occupied of e-learning to facilitate the mechanism with the learning environment among the diverse parties. This study highlights some of the important problems that appear in the web_based virtual learning environment (VLE), and showed a model with one of the recent and the main technologies as a solve for the Mobile Agent' problems. This study presents the interactive and collaborative, and vital role of the Mobile Agent in connecting intellectual efforts between students and instructors working in a secure VLE bearing in mind agents' roles, tasks and interactions in the analysis.

Keywords: Mobile Agent (MA), E-learning, Collaborative Agent (CA), Guarding Agent (GA).

Introduction

Networks considered as wide-area grows through the internet and intranets; Mobile Agent (MA) technology is engaging and attracting more attention. Therefore, Mobile Agent goes via a lot of Applications through the web like auction room, commercial transaction, etc... . Mobile Agent (MA) technology may contribute to solve many problems for numbers of projects. Importance of Mobile Agent technology growing rapidly day after day, they retain the security of mobile agent became a must, because it include contains all types of security topics [10]. Numerous studies of e-learning in internet epoch evaluation have neglected the spoofing problem for instance reports that professors who do e-learning in the internet era don't see spoofing as a main problem, but if a high percentage like 95% of the students cheating are out of control and not being caught, a lot of professors are very poor judges of fraud frequency. Spoofing that is not caught, only as there are many of times more break-ins by hackers and spies to computer systems than those that are noticed. Since several problems of information security over networks are very common today, it is not surprising to notice that problem of "educational security" could be common also. Majority of information stored in the current virtual learning environment is the production of a lot of instructors' job with high and robust technological mechanism by numbers of students and administrators [1, 9].

Virtual Learning Environment

Characterized virtual learning environment (VLE) contains of possibilities clearly in all aspects of collaborative learning. We hear a lot of other approaches and expectation concerning the advantages of collaborative learning, and over anticipation always have inverse effect .Mobile agent applications came to be a suitable solution to many problems for creating influential web- based virtual learning environment for example seldom of particular instructors in the specified field and lack of knowledge and skills for learners that been needed in more often in the field of their work or research. The learning environment comprises many services and tasks. Service self-registration on educators led Training. Training workflow included (User questions and notifications, manager approval, arrangement and waits list management, etc... [15].

The provision service online learning (e.g. Computer–based training and learning, Write, Read& Observations), Management of continuous many of professional education (CPE), collaborative learning such as (application sharing, meeting online through a synchronous among students and instructors, discussion threads through answers and pose questions) and training resources manage (e.g. Instructor facilities included, PowerPoint, or chatting, video and different equipments). Moreover both of students and instructors can use the a lot of tools available through the application to virtually raise their hand, chat rights send messages, or answer some of the questions on the screen given by the instructor or student presenter, also students are expected to complete lessons and assignments independently through the system called "self-paced" learning. Figure (1) displays the interaction between students and instructors into the main components of the LCMS [3, 13].

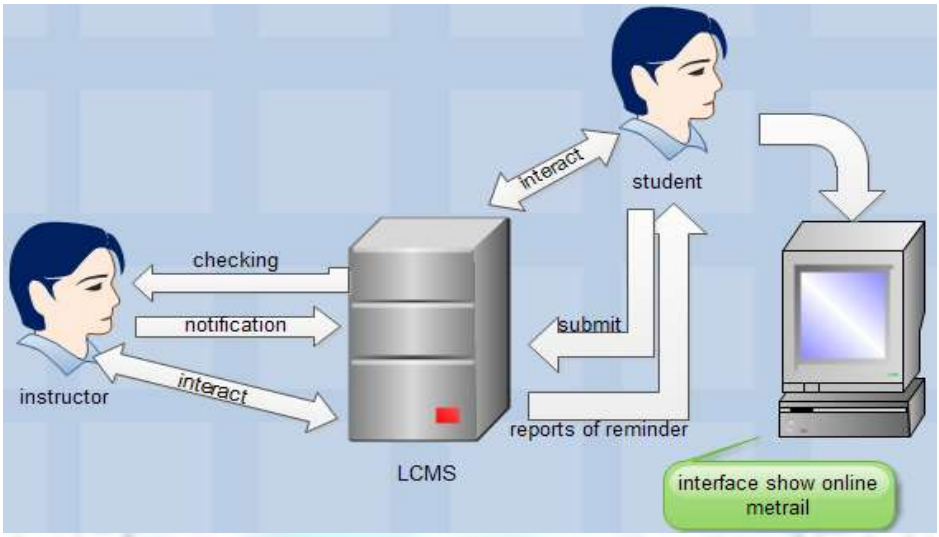

Figure 1: shows Interaction Diagram into the main components of the LCMS

The Majority of the distance learning courses are no more than developed harmonization courses, in which student stands alone in front of computers to take some of information to be transferred via the internet. This study presents a solution for evaluating of the assessment and assigning Collaborative Learning Service (CLS) that is related to creating web- based services for the Virtual Learning Environment (VLE) to prevent the breaches which represented through e-spoofing, the collaborative learning service will simplify collaborative course evolve and cross institutional enterprise and research work which adapted[14] . The aim of study for engaging the students in CLS, therefore of the following factors: describe the cooperation between students with multi cultural backgrounds for direct interactions cross cultural interface within the virtual learning environment (VLE), in which the student engage a much wider domain of communication tools such as (e-mail, chat, web -page creation, PowerPoint presentation, and different multimedia tools) [7,2]. In addition into participation of the students in course instructor there are many of interactions via national collaboration in order to successfully implement the course in a high secure environment with effective performance.

The Proposed Model

There are two services in our model has been started first: The Evaluation Agent (EA) that is sent through the network dedicated to the assigned student server and assess his/ her answers. The (EA) frame contains the instructors Questions and the suitable choice of the answers and model answer form. Second: dedicate the Collaborative Agent (CA) for Collaborative Learning Service (CLS).And Guarding (GA) devoted in suitable live in constant status at the starter server. The sharing entities are locked in case of interacting with those entities for high security issues. The main components in this model included student individual or group (Learning Entity), the instructor (Teaching Authority), assessment type (Compulsory Testing, Self- Assessment), exam, nature of the question, Question, suitable answer, evaluation procedure (as an Evaluation Engine) the student is able easy access available tests, to implement a test and equip their answers. Moreover the students should also receive feedback occasionally regarding their performance (the grade, the evaluating, the correct answers, etc.). Figure (2) displays the Evaluation tasks agent during its send in the VLE.

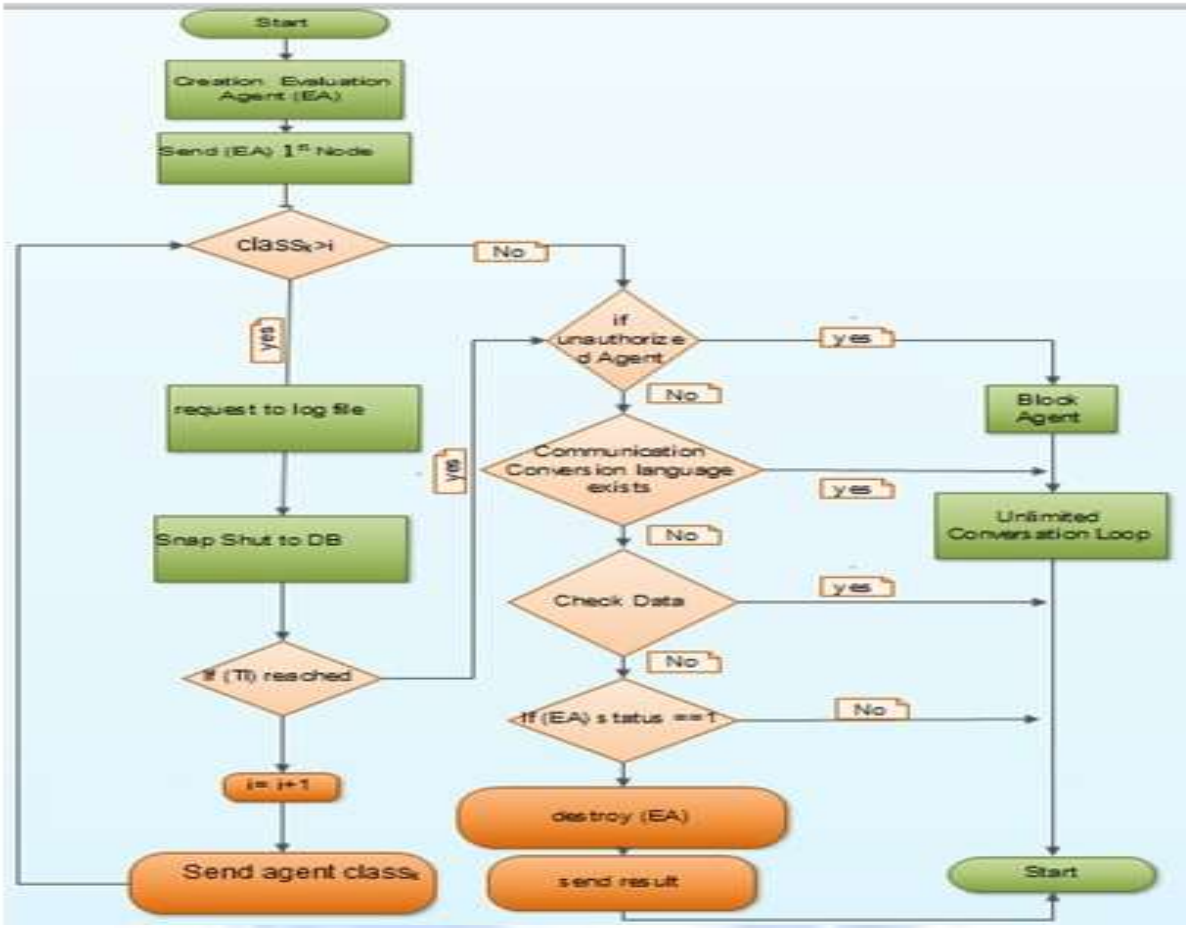

Figure 2: displays the Evaluation tasks Agent (EA) during its send in the VLE.

The main assessment engine equips the knowledge for evaluating the student's answer opposite the correct answer connected to the question. Students answer must be limited scope; meanwhile the long natural language essays will not be analyzed. The Teaching Authority provides the examination. A test may be included in different assessments (apply compulsory examinations, self-assessments, etc.) as well as to numbers of questions. A question is associated to nature of question type, to one or more of correct answers and also to an evaluation procedure. The current proposed model display in figure (3) where agents implement is arranged of communication tools, a task workplace, and a lot of learning resources. Usually asynchronous communication tools include many functions for checking the collaboration and connection of group members and the status of group process. The main tasks workplace consists of the following tasks: mission preparation, individual learning, group learning and task evaluation. While the learning resources, which include class contents and reading materials, are provided and designed to conduct research reports and group result [8, 11].

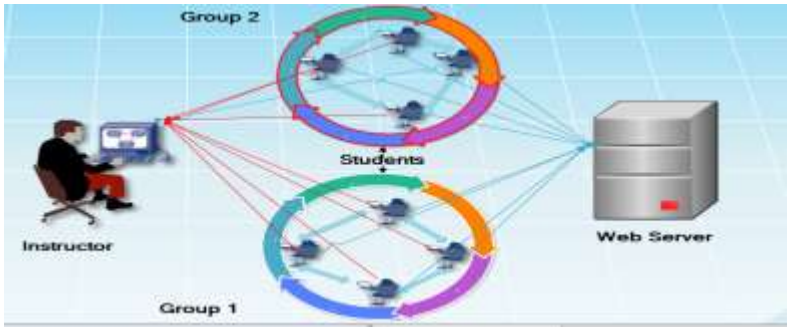

Figure 3: displays Web-based Collaborative Learning

Coordination Tasks Scenario

This study presents a solution for evaluating the assessment and customizing Collaborative Learning Service (CLS) that is interested in creating Web-based services for the virtual learning environment (VLE). Meanwhile the collaborative service learning will facilitate collaboration course sophistication and via institutional enterprise and research work. Taken into consideration an important issue related to the agent role is the specification, coordination, collaboration, and communication between agents and each other. In addition Virtual Learning entity has to be locked when someone is editing it. In this respect the (EA) is therefore responsible for roaming to student's site in collaboration with the existing Personal Assistant Agent in order to achieve the assessment, for showing the questions through a friendly graphical interface to the student, for allowing the students subscribe to enter his answers, for evaluating the answer and selecting neatly and accordingly the next question (adaptive manner) and eventually providing a result of the evolution. Bearing in mind the flow of the documents with the virtual learning environment (VLE) is as follows: the document produced by X must be sent to be approved and verify to Y and Z before to be shown. The Server (X) is the starter server where the GA found and lives the EA roam and send through the network till it find the Server (Y, Z) trying to evaluate the answer for set of students and taking the assignment. Meanwhile the transmission is either an external message sent to another agent, or an internal event sent to another mission of the same agent. In this model, each synchronous task is modeled as a case chart diagram associated with the agent.

There are two types of the test (Pull and Push): A Pull test (Self-Assessment) Scenario started by the student, who learned certain section of the specific topic and wants to assess his/ her knowledge and comprehension. Thus, this case in which test type is constituted by the student and no record of the evaluating is registered in the VLE. While a Push test (Exam) Scenario started with the instructor, who enforced a certain test type for assessing the students' knowledge level. In this case the arrangement is done by the instructor and the result of the evaluation is recorded in the VLE. According into our scenario allows each protocol and its applications to proceed and implemented in mobile agent and disseminated to remote computers via the migration of agents supporting the protocol. Once the runtime system starting can pull and push the code of an agent and its case separately to remote nodes, and can control automatically catch the code of the visiting agents in order to enhance performance. Meanwhile the CLS Process begins as follows when a student starts the loading CLS agent over the runtime directly and then the loaded agent display a window to allow to input the name of the CLS student' colleague .In addition the agent asks the runtime system to generate its clone at the same node. Next step, the clone will agent asks the runtime system to migrate itself consecutively to the node of the other participant. After dissemination of them the original agent and the clone agent can start autonomously to create suitable communicate with each other [4, 16].

Security Issues

In this study we proposed model covers the three main security characteristics: safety and integrity, easy availability and boost confidentiality.

A. Safety and Integrity

In this case the trust put into the all information withheld by the stored student's reports? Digital signatures are very necessary and security mechanisms that equip the safety and integrity of a report by enabling the expose of unauthorized, if the digital signature not find with report contents then this report is marked as participant unauthorized.

B. Easy Availability

The easy availability of student information and accessing of this information for the purpose the registration of users within the system must be covered. With state of system failures the system can be without difficulty recovered via restore points, backups. The mission of the system is monitored by a number of reports which provided with all detailed repository, meanwhile the number of reports daily retrieved and compared to what anticipate and the number of sessions of different participants in monitored. Any deviation from anticipated values will trigger a notice message directly to the system administrator.

C. Boost Confidentiality

Important and sensitive information stored or transferred within the system must be very confident. This confidentially is often obtained by controlling access to information and from available protecting it over the network communications.

Conclusion

In this study we had analyzed and designed a model in specific areas of (VLE) by using the very suitable technologies. Mobile agent added a new dimension for VLE that available appropriately to facilitate collaborative course evolve and cross institution enterprise and research work. Mobile Agent helps in creating the joint intellectual efforts between students and instructors working in a secure VLE. In our study we had taken a lot of advantages of a goal-driven approach; taken in accounts the agent specific issues like tasks, roles and interactions in the analysis.

Perspective Work

- In this study the proposed model will be more reinforce e-learning content and contribute in enriching the experience via connected knowledge and skill bases. That will help to give suitable advice to learners and real-time feedback.

- Design and develop an agent for appropriate synchronous communication, especially by using collaborations' ways like chatting and shared whiteboards.

References

[1]. Aggarwal, A. K., & Bento, R. (2000), "Web-based education. Web-based learning and teaching technologies: Opportunities and challenges", 2-16.
[2]. Andronico, A., Carbonaro, A., Casadei, G., Colazzo, L., Molinari, A., Ronchetti, M. (2003), "Integrating a multi-agent recommendation system in a mobile learning management system. proceedings of Artificial Intelligence in Mobile System", 123-132.
[3]. Castro, F., Vellido, A., Nebot, À., & Mugica, F. (2007), "Applying data mining techniques to e-learning problems, In Evolution of teaching and learning paradigms in intelligent environment", (pp. 183-221). Springer Berlin Heidelberg.
[4]. Daneshgar, F., Van Toorn, C., & Chan, S. C. E. (2008, December), "E-Learning in workplaces. In Information & Communications Technology", 2008. ICICT 2008. ITI 6th International Conference on (pp. 65-70). IEEE.
[5]. Dieterle, E., & Clarke, J. (2007), "Multi-user virtual environments for teaching and learning. Encyclopedia of multimedia technology and networking", 2, 1033-44.
[6]. Kawamura, T., & Sugahara, K. (2005), " A mobile agent-based p2p e-learning system", IPSJ Journal, 46 (1), 222-225.
[7]. Laouris, Y., & Eteokleous, N. (2005, October), "We need an educationally relevant definition of mobile learning", In Proceedings of m Learn (Vol. 2005).
[8]. Liang, P. H., & Yang, J. M. (2011), "Virtual personalized learning environment (VPLE) on the cloud", In Web Information Systems and Mining (pp. 403-411), Springer Berlin Heidelberg.
[9]. Lin, F. O. (2005), "Designing distributed learning environments with intelligent software agents", Information Science Publishing.
[10]. Mencke, S., & Dumke, R. R. (2007), "A Framework for Agent-Supported E-learning", In Proceedings of the International Conference of 'Interactive computer aided learning' ICL2007: EPortofolio and Quality in e-Learning.
[11]. Metaxiotis, K., Psarras, J., & Papastefanatos, S. (2002), "Knowledge and information management in e-learning environments; the user agent architecture", Information Management & Computer Security, 10 (4), 165-170.
[12]. Monahan, T., McArdle, G., & Bertolotto, M. (2008), "Virtual reality for collaborative e-learning. Computers & Education", 50 (4), 1339-1353
[13]. Motiwalla, L. F. (2007), "Mobile learning: A framework and evaluation. Computers & Education", 49 (3), 581-596.
[14]. Nawaz, A., & Kundi, G. M. (2010), "Digital literacy: An analysis of the contemporary paradigms", Journal of Science and Technology Education Research, 1 (2), 19-29.
[15]. Pankratius, V., & Vossen, G. (2003), "Towards e-learning grids: Using grid computing in electronic learning", (pp. 4-15). Department of Management Systems, University of Waikato.
[16]. Sicilia, M. A. (2005), "Ontology-based competency management: Infrastructures for the knowledge-intensive learning organization", Intelligent learning infrastructures in knowledge intensive organizations: A semantic web perspective, 302-324.
[17]. Stankov, S., Glavinic, V., & Rosic, M. (2010), "Intelligent Tutoring Systems in E-learning Environments: Design, Implementation, and Evaluation", IGI Global Snippet.