An Doubly Linked Tree Approach for Webservice Based E-Learning

Venu Madhav Kuthadi, and Raja Lakshmi Selvaraj

***Abstract*—**Now-a -days, E-learning has become an important trend for education based on distance learning. The institutions of higher education have raised their interest in the educational services which is based on the internet and that is defined as E-learning. Virtual classroom is an e-learning system which is an open classroom for the distance learning people. It integrates with the WS (Web Service) technology to give the benefits of incorporate interfaces in the education environment. The main problem which is raised in the e-learning system that too classroom based is Scalability and the Extensibility. Also the e-learning mechanism initially begins with extracting and reviewing of web information from web logs. An efficient assessment of scalability and the extensibility will give a positive result for improving the systems of distance learning in future. E-learning is an effort which helps to learn with the help of electronic technology like internet. It also helps to follow the behaviors results of the learner and also from the review results. E-learning has become very famous because of its positive attitude which gives more flexibility to satisfy the learners. With the help of E-learning a candidate can get trained easily at any time as their wish and also at any place in the world. Moreover there are also some disputes like extensibility and scalability in e-learning which is optimized by utilizing the WS technology. The scalability is been monitored continuously based on the accessing of web information by different users. Also with the help of web log information the activities of the E-learning is been reviewed and is been extracted with the latest approach

Called Doubly Linked Tree. The purpose of utilizing this approach will make the system more Extensible. Therefore the

Information of mining is mostly utilized for tracking the candidates and also for decision making activity.

***Keywords*—** Systematic Evaluation, WS (Web Services), Virtual, Scalability and Extensibility.

I. Introduction

IN the latest generation, the usual learning method of Web based learning is a real time where the candidates and the teachers will have a live communication with each other in the similar classroom which gives unrivaled benefits. Various Web based Learning method agrees asynchronized process where the teacher can directly publish the materials for learning in the internet so that the candidates can learn at any time and at anywhere as they wish. The learning method of virtual classroom follows a synchronized method where the candidates who are inside as well as outside of the class can hear the live instruction which is given by the teachers. In most of the case the synchronized method attracts the concentration and the interest of many participants in an efficient manner than the asynchronized method. So the practice of real time communication of virtual classroom with the tele-education gives a vital importance in the distance learning system. Moreover, the growth of pervasive computing technologies aims by giving an human computer edge with a multimodality interactions. By combining these technologies in the classroom results in an enhanced way where both the candidates and the teachers get more advantage. It also allows the teacher to communicate directly with the local candidates and also with the remote candidates so that the candidates can also give their individual feed backs to the teachers. Many learning methods are surrounded with these characteristics and they are mostly of like Class Talk [14], Smart Classroom of Tsinghua University's, Communication workspace [2] and the Active class [11]. These methods are looking for a better training and also for a better learning environmental mode, that should be of an usual virtual classroom education and these are methods known to be as an E-Learning methods for a Classroom Based.

A. Recent Challenges and their Requirements

In E-Learning there are several Methods which supports for a classroom based learning i.e for both the candidates and the teachers and also the system is proposed to achieve more successful results. Many E-Learning methods of Classroom Based offer a human computer edge naturally and also it offers the interaction of multi-modality by combining the technologies of pervasive computing into the classrooms. Moreover, by the growth of pervasive computing the latest needs are been increased for the system honesty, Scalability and also for the extensibility. Any individual can utilize the learning contents at any time, at any directions and at any places with the help of an internet connection. The main problem in building the online learning system is due to its surroundings which are attached with some important features like Synchronicity, interactivity, centralizing as well as decentralizing, multimedia and the hyper textually. Additionally, many obsolete methods are been utilized in the distance learning which can reformulate the technological progress for representing it in a reliable and an effective manner. The security architecture is needed to increase the learning surroundings which help to face the needs of

Venu Madhav Kuthadi, Department of AIS Faculty of Management University of Johannesburg South Africa.

Raja Lakshmi Selvaraj, Department of Computer Science Botswana International University of Science and Technology, Gaborone Botswana

validation and approval. The activity of online learning requires to be reviewed for making decision and also for increasing the personalization.

B. Recommended Approach

A new prototype approach known as Smart Learning is proposed to tackle the challenges which are been stated above. A Smart Learning is an E-Learning system of a classroom Based which utilizes more Scalability and also more Extensibility in e-learning surroundings. Many advantages are there in the Smart Learning environment where it has a union of the candidates who can directly give their feedback and that feedback can be viewed by the other students who are all in the e-learning surroundings. Apart from this a feedback system and a voting mechanism is utilized for the candidates which can help them to view the ordered rank of the professors uploaded study materials given by different candidates. This system also helps the candidates to refer the professors uploaded study materials with a student voting mechanism. The assignment marks are given to the candidates based on the attraction or the involvement of the candidates on the e-book materials that they view. The WS (Web Service) technologies are utilized for accessing different materials by various students at a same time by improving the Scalability of the system. The activities of E-Learning is also monitored by the web log documents which are been mined by the doubly linked tree algorithm for the purpose of making decision and also for tracking the activities of the candidates.

II. Related Work

This part contains the survey of previous work which is done with various types of techniques. The latest challenges are the Scalability and the extensibility where most of the E-Learning system of Classroom based fails to tackle this challenge. By combining the WS (Web Service) technology, the E-Learning system gives more benefits where it can be easily connected to the other systems [1]. E-learning is defined as an education which is learned without a human tutor and with the help of the internet at anywhere in the world and at any time as per their wish. The latest proposed WS architecture is evaluated with the most of the architecture and utilized a system of Intelligent Tutoring to work on the Web. The WS which is based on the learner modeling establishes an enhanced communication among the server and the client applications. This system is been evaluated with the usual architectures [5]. After finishing the learner model updates, generally the communication with the systems begins. This method is repeated again and again till the learner log off the system (If the learner is on online). In this way only the server updates the latest gained information on the systems. This approach allows the candidates to access the activities in online learning with the help of Web Log mine. The learner navigation activities and the courseware association are evaluated to typify the online learning [4]. The raw logs are clipped and developed in the user sessions to study the Web Usage. The Courseware page and the learning contract supports to remove the candidates based on their performance data from the Web Logs. The removal of Web usage appears at the Web access log. In the Web Log, the Web server has the report of the each and every access of the Web Pages. When the access is increased in the Website the entry numbers is also increased in the Web Logs. When these web logs are extracted well, it offers valuable information for making decision. To extract the Web Log well, an algorithm is proposed. The issues of managing the large amount of access prototype is approached well [2]. The result contains 2 phases. The arrangement of the access series is compressed by utilizing doubly link tree, in the first phase. A Mining algorithm is utilized to extract the common access series well in the second phase.

III. Smart Learning Scenario

A system is utilized and also discussed briefly for a smarter learning approach which highlights the openness and also offers the fresh experience for both the candidates and the teachers. This paper also proposes a WS technology and a Data mining method which automatically removes the implicit information of the book which is updated by the tutors. It also helps to track the activities of the candidates in an effective way. A Doubly link tree based Data mining technique is used in students web logs for making the decision in an efficient and a faster way. When compared with the earlier work, the doubly link tree makes the decision in an efficient manner. The approaches functions are as follows:

A. Constructing of an E-Learning System

E-Learning system is the primary process where it begins by controlling the repository and by maintaining the log files of the candidates and also it maintains the details of course work materials which is prepared by the tutor. Therefore, the information and the materials of the tutors are also been updated in the e-learning system when they initial login into the system. The tutors will verify the votes and the regular attendance of their subject's candidates to assign the mark based on their individual votes and the attendance of the candidates. The candidates can verify the content based on their subject requirement and can vote to those particular materials according to their satisfaction. The administrator can login successfully into the system with the help of their individual login ID to verify the information of the tutors, candidates and the materials which is updated by the tutors. Later on the votes will be checked to give ranks and then the ranking process will be completed. In this way the E-learning system of Classroom based supports both the candidates and the tutor in the education process and it has achieved successful results. Moreover, by the growth of pervasive computing the latest needs are increased for the systems scalability and extensibility.

B. Applying Web services

The general technique for accessing web data in an e-learning environment is very general and normal. The WS

based approaches are a dispersed middleware Technology which utilizes a very simple protocol based on the XML to permit the applications to get data and also to send the data across the WS platform and is explained clearly in terms of interactions that are obtained and the response that are been sent. In this, the education mechanism can also be established for the preferred digital learning assets by sending a Simple Object Access Protocol (SOAP) Query to the Universal Description, Discovery and Integration (UDDI) Registry. The request is been created based on the query recovered from the Universal Description, Discovery & Integration Registry to the Web Services Description Language repository that is been sent through the transportation layer protocol such as HTTP, to obtain the preferred learning assets. The Web Services Description Languages documents which has the explanation of the preferred learning materials is recovered and also forwarded to the candidates by sending with a Simple Object Access Protocol request through the HTTP Server. By utilizing the WS (Web Services) technology, it automatically permits "n" number of users to view the updated information of the tutors without any disturbances. Moreover it shows well scalability to the application. Many workloads which involves in the server is transferred to the active WS technology for reducing the energy and also for reducing the time of the server and it quietly relates with the internet servers to interact and to parse the WSDL (Web Services Description Language) documents. The WSDL documents is been parsed to access a WS actively, by the application of e-learning which will communicate directly with server. This paper also explains clearly about the successful architecture which permits the users to get the required information through the active WS detection process by just giving the method dispute value and the search phrases into the actively created Graphical User Interface (GUI). Figure 1 represents the clear framework of the proposed design.

C. Doubly Linked Tree Generation

It is created to find the web logs of the candidates and also to calculate the weightage of the course materials of a specific tutor. In the doubly link tree, the log files of the users and the possible events that are been grouped to provide as an input to the tree. The implementation of doubly link tree algorithm will results in obtained entire information as requested by the e-learning web services system in a strong form.

The system also does not need any additional or sustaining repository to extract any prototype. In the database, the tree length will also be of a manageable length to maintain its normal series. In this, the double link tree is utilized for identifying the outputs like tracking the activities of the candidates and their attendance and also for identifying weightage of the course content which is been updated by the tutors.

D. Algorithm Psedocode

Steps 1

Input: Users Web log information and their events E.

Output: Generating of the doubly linked tree T.

Steps 2

2. For each and every log generate a sequence called S of a log file

2.1. Each event as E

2.1.1. Each event access sequence of the log database. If a selected event of access sequence is equal to selected event of E then

a. count event = count event + 0.5

b. continue with the next event in E.

3. For each event in E if event qualify the threshold add that event in the set of frequent event FE.

3.1. Root node is generated with T

After the implementation of this Algorithm, the Doubly Link tree is obtained for the candidates Web-Log details.

By utilizing the Mining Algorithm of Doubly link tree, offers more advantages rather than the Apriori Algorithm and they are mentioned below:

(1) Generality

The Mining Algorithm of Double Link tree doesn't restrict the number of items in a common Sub Item sets and it doesn't need any of the rule patterns. Moreover, the items are not essentially adjacent in assisting the item set in a common Sub Item set, that is, it can be far away from each other.

(2) Time efficiency

Normally, the algorithm of data mining like the Mining Algorithm of Doubly-Link tree is very proficient as it struggles to avoid the scanning data several times by removing the unneeded computation as potential. Moreover, as this mining algorithm (Doubly-Link Tree) creates particularly closed common patterns and it can also avoid creating an Sub-Items of an Exponential numbers.

(3) Space efficiency

From the Mining Algorithm of Doubly-link tree, we can find closed rules and also the rules which include lots of other rules with the similar support. The closed rules not only save the

Space, but also it drastically decreases the number of rules

Which needs to be examined or referenced. In addition to these, it also boosts up the judgment in an efficient manner

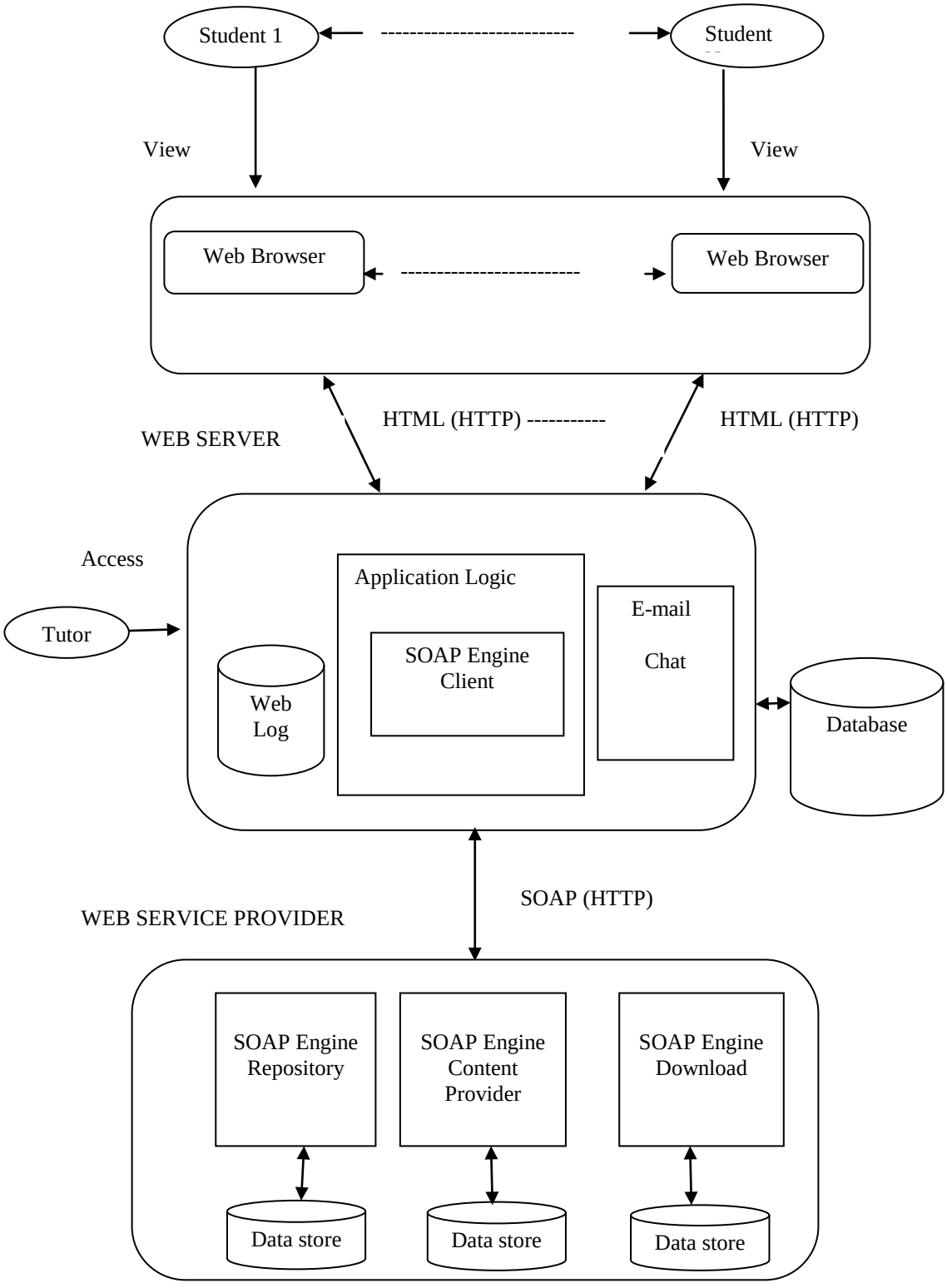

Fig. 1 Process Flow Diagram of the Proposed Approach

IV. Results & Discussion

There are numerous of measures that are been taken to evaluate the effectiveness of the Doubly-Link tree approach for E-learning based on the WS technology. In this paper, we have utilized the processing time and the resource accessing time as the two parameters for measuring the effectiveness of the system. Many researches has been done and is been classified in this paper to evaluate the performance of the Doubly-Link tree Mining Algorithm. This approach gives an extreme novel mechanism in assisting and also in evaluating the online educational activities in an effective way. The

proposed approach works on the principle of providing the e-learning materials to the candidates in a very suitable manner and also it support the e-learning system to create more scalability and more communicative. The activities of the candidates are followed by the Web-Log mining which creates the system more precise and also provide more beneficial to observe the activities of the candidates.

V. Conclusion

The latest challenges and the latest needs which is increased by the e-learning system of classroom Based is mentioned clearly. The proposed system is been used for tackling the e-learning system activities well by an advanced approach called smart learning is been proposed. This smart learning is an open platform which is used for accessing of intercultural classes and also intercontinental classes with more enhanced characteristics like WS technology and Data mining approach for an easy and comfortable form of operation. E-learning visualizes a future learning process where it links and work together with each and every one in an open network. In this system the teachers and the candidates with various background utilizes various subjects from various countries are been educated together in this e-learning system. It also utilizes an efficient WS technology and the Double link tree based approach to make E-Learning system as an open platform for all students.

References

[1] Mario Muñoz-Organero, "Analyzing Convergence in e-Learning Resource Filtering Based on ACO Techniques: A Case Study With Telecommunication Engineering Students," IEEE, NOVEMBER 2010.

[2] Yue Suo, Naoki Miyata, Hiroki Morikawa, Toru Ishida, "Open Smart Classroom: Extensible and Scalable Learning System in Smart Space Using Web Service Technology" IEEE, JUNE 2009.

[3] Hong Qing Yu, Carlos Pedrinaci, Stefan Dietze, and John Domingue "Using Linked Data to Annotate and Search Educational Video Resources for Supporting Distance Learning", IEEE, JUNE 2012.

[4] Ratnesh Kumar Jain , Dr. R. S. Kasana, Dr. Suresh Jain, "Efficient Web Log Mining using Doubly linked list" 2009.

[5] Akram Alkouz and Samir A.El-Seoud, "Web Services Based Authentication System for E-Learning" August 2007.

[6] WANG Tong, HE Pi-lian "Web Log Mining by an Improved AprioriAll Algorithm", 2005.

[7] F. Tao, P. Contreras, B. Pauer, T. Taskaya and F. Murtagh, "Users Interest Correlation through Web Log Mining", 2001.

[8] M. Birattari, G. Di Caro, M. Dorigo, Toward the formal foundation of ant programming, in: M. Dorigo, G. Di Caro, M. Sampels (Eds.), Ant Algorithms, Proc. ANTS 2002, Third Internat.Workshop, Lecture Notes in Computer Science, Vol. 2463, Springer, Berlin, Germany, 2002.

[9] C. Blum, Theoretical and Practical Aspects of Ant Colony Optimization, Dissertations in Artificial Intelligence, Vol. 282, Akademische Verlagsgesellschaft Aka GmbH, Berlin, Germany, 2004.

[10] C. Blum, Beam-ACO—Hybridizing ant colony optimization with beam search: an application to open shop scheduling, Comput. Oper. Res. 32 (6) (2005) 1565–1591.

[11] Taran, Carmen, "Motivation Techniques in eLearning,", Fifth IEEE International Conference on Advanced Learning Technologies (ICALT'05), 2005.

[12] Maristella Agosti and Giorgio Maria Di Nunzio , "Web Log Mining: A Study of User Sessions",2007.

[13] Distance Education survey results, "Tracking the impact of e-learning at community colleges" , 2008

[14] E. Allen and J. Seaman, "Class Differences Online Education in the United States," http://sloanconsortium.org/publications, 2010.

[15] J.W. Brackett, "Satellite-Based Distance Learning Using Digital Video and the Internet," IEEE Multimedia, vol. 5, no. 3, pp. 72-76, July-Sept. 1998.

[16] T.-D. Wu, Y.-Y. Yeh, and Y.-M. Chou, "Video Learning Object Extraction and Standardized Metadata," Proc. Int'l Conf. Computer Science and Software Eng., vol. 6, pp. 332-335, 2008.

[17] M. Hausenblas and M. Karnstedt, "Understanding Linked Open Data as a Web-Scale Database," Proc. Second Int'l Conf. Advances in Databases Knowledge and Data Applications (DBKDA), pp. 56-61, Apr. 2010