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An Efficient e-Learning System Using Web Services

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Abstract: Nowadays, Web based platforms are quite common in any university, supporting a very diversified set of applications and services. Ranging from personal management to student evaluation processes, Web based platforms are doing a great job providing a very flexible way of working, promote student enrolment, and making access to academic information simple and in an universal way. Students can do their regular tasks anywhere, anytime. Sooner or later, it was expected that organizations, and universities in particular, begin to think and act towards better educational platforms, more user-friendly and effective, where students find easily what they search about a specific topic or subject. Profiling is one of the several techniques that we can use to discover what students use to do, by establishing their user navigation patterns on Web based platforms, and knowing better how they explore and search the sites pages that they visit. With these profiles Web based platforms administrators can personalize sites according with the preferences and behaviour of the students, promoting easy navigation functionalities and better abilities to response to their needs. Web based platform. E-Learning or Learning Management System (LMS) is a web based application which enables its users to learn new subjects, evaluate the user through online tests and assess the overall performance of the user. The system also provides a feedback mechanism for making the system more useful and efficient

Keywords: e-learning, web services

I. INTRODUCTION

The development of a web site by an organization may not be enough to obtain the success it expect on the Internet. Being the web a market with a large facility to publish contents, certainly will exists other sites, with the same or very similar contents, that users can use as an alternative. Thus, its necessary to ensure that the site is in line having what its potential users want, in order to avoid they abandon it after some time of using, going to another site with better contents proposals, a more adjusted organization to their needs, or incorporating strong user friendly navigation facilities.

During the last few years, the number of students using web based platforms for learning activities grew a lot, reaching a level quite interesting to analyse the way how and when they use those platforms and their resources. Goals are very clear: to optimize quality of service, to increase resources availability, to attenuate the effect of services (and resources) not used, and to facilitate access to didactic material 24 hours a day. Today, we see universities promoting the development and maintenance of very effective sites, being their administrators quite concerned about their use and effectiveness. Some of them use to monitoring the activities performed on their sites, especially the ones that support eLearning platforms, in order to provide better quality of service, to supply better information (on time) and to avoid eventual systems downtimes. Additionally, this way of looking for web usage has been improved in the sense to discover critical periods of site navigation and exploitation, trying to prevent service bottlenecks and lower rates of service quality these are two of the most critical aspects that lead students to avoid or abandon eLearning oriented Web sites. systematic activity, involving massive exploitation of all the available clickstreams, storing, transforming and analysing them with the most recent techniques to do that. With these profiles established we could personalize a site according with the needs of students, promoting easy navigation and better ability to response to customers needs.[4]

To establish student profiles, identifying their behaviour when using a eLearning site, we need to monitoring their daily usage and collect all information we can about their activities inside the site, knowing what kind of links they use to follow, services or documents they use to access, their frequency of usage, or simply what are their usual entry points. All of this can be done observing the access logs of the site, and analyzing things such as the IP number of the machine used during the navigation process, the pages visited (their links, and data and time of access), time of permanence in a particular page, and the resources used, just to name a few. Taking as the IP address as the basis to characterize student navigation, we can ordered the pages by date and time of access and group them into sessions, considering a predefined navigation period, which will define the period to group the visited pages, and a period of inactivity that will define the end of a particular session. Then, analyzing all the student sessions we can establish navigational patterns, representing the most regular paths that students use to follow during a session, and consequently generate a profile to personalize (if necessary) the contents of a site.

A. Objectives:

The objectives to be achieved from the project are…

a. An efficient e-learning system
b. Learner's assessment through evaluations
c. Adaptive nature of system according to learner's assessment

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II. RELATED WORK

Web based platforms are expanding their influence in many sectors. From services to industrial plants we can find several applications in the area. ELearning (Carliner & Shank 2008), as we know, it is not an exception. For many years educational institutions began to install and explore Web based platforms, frequently only as a simple way to promote themselves or to receive documents repositories. Quickly they discover the huge attractively and flexibility of Web based platforms, a great freedom in courses contents managements and maintenance, and as a practical way to improve learning processes, share knowledge and expertise, augment student enrolment, and of course reduce operational and maintenance costs. Application of Markov chains in the establishment of such profiles for a target eLearning oriented Web site, presenting the system we implemented and its functionalities to do that, as well describing the entire process of discovering student profiles on an eLearning Web based platform.

[13][14]Brian Thoms presents In his research, examine the design, construction, and implementation of a dynamic, easy to use, feedback mechanism for social software. The tool was integrated into an existing university's online learning community (OLC). In line with constructivist learning models and practical information systems (IS) design, the feedback system provides members of the OLC with the capability to rate blog posts and provide instant feedback on the content of their peers. [17]The software was implemented at a US university in an introductory course on IS with the goal of fostering higher levels of learning and social interaction. A content analysis showed higher levels of system usage corresponded with higher course grades. A survey analysis supported these results showing statistical significance between levels of system use and perceived levels of learning.[15][16].

In "Microblogging in a Classroom: Classifying Students' Relevant and Irrelevant Questions in a Microblogging-Supported Classroom" MICROBLOGGING, is a type of blogging that lets the users post short text messages (usually less than 200 characters) to their community in real time via several communication channels such as the web, mobile devices, e-mail, and instant messengers. Depending on whom a user follows (i.e., communicates with) and is followed by, a microblogging tool such as Twitter, can be effectively used for professional networking Recently, microblogging tools have been used in classroom environments as a communication tool between a student and the instructor [19] as well as between students themselves Utilizing microblogging in classrooms has several advantages and disadvantages. An important issue with large microblogging supported classrooms is that the number of questions comments an instructor receives from the students can be many more than what she/he can answer in a limited time.

Therefore, there exists a need to differentiate the relevant questions/messages that should be addressed by the instructor from the irrelevant messages that need not or should not be addressed To the best of our knowledge, there is very limited prior work on the categorization of relevant and irrelevant.

Christoph Hermann and Thomas Ottmann present the integration of a Wiki with lecture recordings using a tool called aofconvert, enabling the students to visually reference lecture recordings in the Wiki at a precise moment in time of the lecture [12]. This tight integration between a Wiki and lecture materials allows the students to elaborate on the topics they learned in class as well as thoroughly discuss their own aspects of those topics. This technology can enable students to get actively involved in a collaborative learning process.

Mihaela Cocea and Stephan Weibelzahl proposed approach "Disengagement Detection in Online Learning: Validation Studies and Perspectives"[9] for disengagement detection is potentially system-independent and it could be generalized to other systems. These results provide the blueprint for a component for automatic detection of disengagement that can be integrated into elearning systems to keep track of the learner's engagement status. Such a component offers the opportunity to intervene when appropriate—either automatically or through a tutor disengagement detection represents the first step toward more detailed motivation elicitation. For example, once disengagement has been detected, the system may enter into a dialog with the learner in order to find out more about his/her motivation [7]. Furthermore, this information could be used for more targeted personalized intervention [8].In both systems, iHelp and HTML-Tutor, two different categories of disengaged learners were distinguished based on their patterns of behavior: 1) disengaged students that click fast through pages without reading them and 2) disengaged students that spend long time on a page, (far) exceeding the needed time for reading that page. . Mario Amelung, Katrin Krieger, and Dietmar Rosner present approach[13],In that theye are using the web-based content management system (CMS) Plone1 to deliver learning material (e.g., slides, notes, or reading lists) to our students, it appeared obvious to employ this CMS as a portal for the management of assignments, tests, and submissions.. As a result, students are often emotionally strained. Faced with sadness, worry, shame, frustration, or despair, people lose access to their own memory, reasoning, and the capacity to make mental associations [7].

Carsten Ullrich, Ruimin Shen, Ren Tong, and Xiaohong Tan in china present approach "A Mobile Live Video Learning System for Large-Scale Learning—System Design and Evaluation"—In China, the number of university students has quadrupled in only six years. How can technology support the access to education of these and future students? In this describe the mobile live video learning system developed at the Shanghai Jiao Tong University. Motivated by the observation that in developing countries, mobile phones have a much higher penetration rate than laptop and desktop computers, we developed a mobile learning system that streams live lectures to the students' mobile devices. The lectures are held as usual in university, not requiring the costly preparation of especially authored mobile learning materials. The system takes care of compressing the video and audio data efficiently so that it can be live-streamed, while maintaining high visual quality of the slides. Due to the synchronous (live) nature of the system, students can interact with the teacher during the lecture, using a set of preprogrammed interactions

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that facilitate feedback with mobile devices with limited input facilities. students.[4] Large-scale evaluations in two lectures with 1000 students each show that students find using the system beneficial. In sum, the mobile live video learning system offers a convenient and cost-effective way of making higher education accessible to large number of students.

Pokpong Songmuang and Maomi Ueno(july-2011) presents "Bees Algorithm for Construction of Multiple Test Forms in E-Testing"

Support, project management tools, data import and export services, personalized access based on role definitions, activities reports, evaluation tools, or heterogeneous document types hosting, just to name a few (Tucker et al. 2002). There is an evidence that Web-based ELearning systems (Schewe et al. 2005) are a clear reality with a significant impact in our lives. We face them practically in any educational institution supporting current activities and adding new value to personal education and student enrolment (Hosan et al. 2006). Day after day, educational managers give more attention to these platforms stimulating and supporting their design based on student profiles, and creating flexible and friendly navigation structures, as well are creating methods and processes to model new Web based educational systems (Rokou et al. 2004). Profiling is one of the best ways we have to go towards an adaptive Web-based eLearning system.

Recent (2011) research at the University of Hertfordshire was able to show that learners and tutors accept and value our automated feedback approach based on objective tests and Computer Adaptive Testing. The research reported in this paper is an important extension to this work. The automated feedback system developed for objective testing has been extended to include practical testing and essay type questions. The automated feedback system, which can be used within any subject area, is based on a simple marking scheme created by the subject tutor as a text file according to a simple template. Marks for each option and a set of feedback statements are held within a database on a computer.

Metaphors (2011) are figures of speech in which a word or phrase that denotes a certain object or idea is applied to another word or phrase to imply some similarity between them. Due to their ability to make speaking and writing more lively and interesting, metaphors have always been popular among students. While metaphors provide significant enhancement of contexts and build upon the sense of community, they can limit the boundaries of the communication between students and teachers. In order to carry out student oriented courses, teachers ought to consider the metaphors students use. In an effort to understand and fill in this communication gap, the authors of this paper have initiated a study that aimed to drive out the e-education students" metaphors in order to suggest a vision for future e-courses.

All of them work towards helping educators to create, manage and maintain online courses, and all their related services, for large communities of students, having abilities to cover educational topics from primary schools to universities. To do their jobs well, Web-based eLearning platforms provide a set of features very powerful, which includes today things such as integration of multimedia objects, multilingual support, project management tools, data import and export services, personalized access based on role definitions, activities reports, evaluation tools, or heterogeneous document types hosting, just to name a few [2]. There is evidence that Web-based ELearning systems [3] are a clear reality with a significant impact in our lives. We face them practically in any educational institution supporting current activities and adding new value to personal education and student enrolment [4]. Day after day, educational managers give more attention to these platforms stimulating and supporting their design based on student profiles, and creating flexible and friendly navigation structures, as well are creating methods and processes to model new Web based educational systems [5]..

III. P PROPOSED SYSTEM ANALYSIS

A. Proposed System:

The system proposed through the current study involves the development of a web based e-learning system to train students with different subjects and technologies. The major features of the said system can be enumerated as below:

a. Detailed lessons on a subject distributed, level-wise:

Each course would consist of number of chapters or lessons. Each lesson will consists of text material, images, program examples, expected output etc. The chapters will be categorized on the basis of difficulty level in range 1 to 3. Initially ever learner will be tutored with level 3. A learner can go forward and backward to read and assess the topic.

b. Student evaluation using a test at the end of each lesson:

Every lesson will be completed by learner by taking a test on that lesson. If a student sores 75 or more marks, then the student will be eligible for next chapter. But if student fails to get 75 or more then the student will be provided with second level of the lesson and the student is re-tested. A student may go up to first level. Same cycle is continued.

c. Generation of results for each test:

The answers given by learner will be evaluated using web service and a distributed database. The application will call a web service by passing the student answers and the web service will return the score back to application.

d. Assessment of student on the basis of score in the test:

Student will be assessed on the basis of marks and accordingly student is promoted to next lesson of given the next level of same chapter.

e. Adoption of the system to a new learning path if students fails in test:

The system will adopt itself based on the score achieved by the student changing levels or the chapters.

f. Feedback sessions at the end module:

The learner will post the feedbacks, comments and reviews about the system and the learner's based on which the application can be modified.

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B. XML based web services:

For the development of the proposed project work, a web application would be developed using web technologies like HTML, ASP.Net and C#. Along with the dynamic web pages, we propose to develop and consume web services based on XML and other features of web services like WSDL (Web Services Definition Language), UDDI (Universal Discovery and Description Integration) and SOAP (Simple Object Access Protocol).

XML Web services are the fundamental building blocks in the move to distributed computing on the Internet. Open standards and the focus on communication and collaboration among people and applications have created an environment where XML Web services are becoming the platform for application integration. Applications are constructed using multiple XML Web services from various sources that work together regardless of where they reside or how they were implemented. There are probably as many definitions of XML Web Service as there are companies building them, but almost all definitions have these things in common: XML Web Services expose useful functionality to Web users through a standard Web protocol. In most cases, the protocol used is SOAP.

XML Web services provide a way to describe their interfaces in enough detail to allow a user to build a client application to talk to them. This description is usually provided in an XML document called a Web Services Description Language (WSDL) documentXML Web services are registered so that potential users can find them easily. This is done with Universal Discovery Description and Integration (UDDI).[16]

One of the primary advantages of the XML Web services architecture is that it allows programs written in different languages on different platforms to communicate with each other in a standards-based way. The first difference is that SOAP is significantly less complex than earlier approaches, so the barrier to entry for a standards-compliant SOAP implementation is significantly lower. The other significant advantage that XML Web services have over previous efforts is that they work with standard Web protocols—XML, HTTP and TCP/IP. SOAP: Soap is the communications protocol for XML Web services. There are other parts of the SOAP specification that describe how to represent program data as XML and how to use SOAP to do Remote Procedure Calls. These optional parts of the specification are used to implement RPC-style applications where a SOAP message containing a callable function, and the parameters to pass to the function, is sent from the client, and the server returns a message with the results of the executed function. new XML Web services take advantage of this flexibility to build services that would be difficult to implement using RPC. The HTTP binding is optional, but almost all SOAP implementations support it because it's the only standardized protocol for SOAP. For this reason, there's a common misconception that SOAP requires HTTP. Some implementations support MSMQ, MQ Series, SMTP, or TCP/IP transports, but almost all current XML Web services use HTTP because it is ubiquitous. Since HTTP is a core protocol of the Web, most organizations have a network infrastructure that supports HTTP and people who understand how to manage it already. The security, monitoring, and load-balancing infrastructure for HTTP are readily available today.

Because SOAP is much smaller and simpler to implement than many of the previous protocols. DCE and CORBA for example took years to implement, so only a few implementations were ever released. SOAP, however, can use existing XML Parsers and HTTP. When SOAP expanded to become a more general-purpose protocol running on top of a number of transports, security became a bigger issue.

WSDL: WSDL (often pronounced whiz-dull) stands for Web Services Description Language. For our purposes, we can say that a WSDL file is an XML document that describes a set of SOAP messages and how the messages are exchanged. . UDDI: Universal Discovery Description and Integration is the yellow pages of Web services. As with traditional yellow pages, you can search for a company that offers the services you need, read about the service offered and contact someone for more information. You can, of course, offer a Web service without registering it in UDDI, just as you can open a business in your basement and rely on word-of-mouth advertising but if you want to reach a significant market, you need UDDI so your customers can find you. A UDDI directory entry is an XML file that describes a business and the services it offers.

There are three parts to an entry in the UDDI directory. The "white pages" describe the company offering the service: name, address, contacts, etc. The "yellow pages" The way services are defined is through a UDDI document called a Type Model or tModel. In many cases, the tModel contains a WSDL file that describes a SOAP interface to an XML Web service, but the tModel is flexible enough to describe almost any kind of service. The UDDI directory also includes several ways to search for the services you need to build your applications. For example, you can search for providers of a service in a specified geographic location or for business of a specified type. The UDDI directory will then supply information, contacts, links, and technical data to allow you to evaluate which services meet your requirements.

UDDI allows you to find businesses you might want to obtain Web services from. The WS-Inspection specification allows you to browse through a collection of XML Web services offered on a specific server to find which ones might meet your needs.

IV. CONCLUSION

Online Learning systems or web tutorials are the new age learning tools supported with the student evaluation system. These tools aid in the distant learning programs whereby the learners have no constraints of time, locations, age or qualifications. A candidate desiring to take a course can register online, learn, take tests and get the certificate online which saves lot of time and money. The online learning systems are very useful for the candidates who pursue advanced courses or non conventional courses which are not locally available. With the use of video conferencing systems these tools can have a great value addition.

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