

Advance E-Tutor: ‘E-Programming Hut’ Based on E-Learning

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Abstract- The issue of e-learning as an advance system for training and educating number of people using information and communication technology. It has been received an increasing level of interest in recent few years. This report overcomes design and development issues of an online education for enhancing programming skills of the user. Existing system “E tutor” has an issue of interaction between student and teacher as in the traditional classroom. It is difficult to solve the doubt for student if they don't have any interaction with the instructor or teacher. The purpose is to design an “advanced layer based e-tutor : "E programming hut" based on elearning”. This system will provide an efficient knowledge of programming and will help user to enhance their programming skills. It will also provide certificate to the student who will complete the course successfully and passes the exam.

Keywords- E-learning, eTutor, E Programming Hut, knowledge,

I. INTRODUCTION

E-Learning is learning where we can use electronic technology to access educational lecture room. It can refer to a course, program or degree delivered completely online. E-learning includes the use of a computer or electronic device e.g. a mobile phone in same manner to provide training, educational or learning material.

II. DOMAIN TECHNIQUES

The classification of various techniques the domain is given in Figure 1

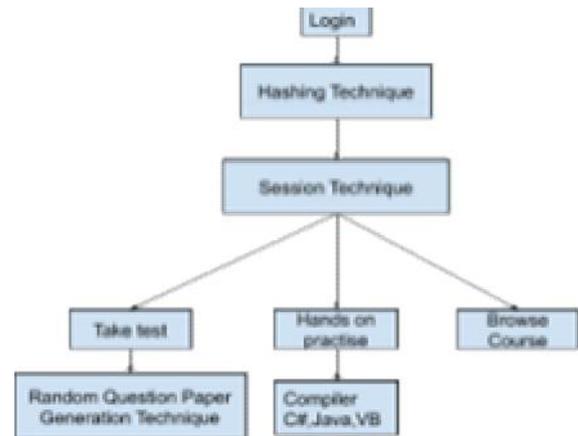


Fig. 1 Classification of domain techniques

This system helps user to find information by providing them with personalized suggestions. Based on above problems of researchers, recommendation techniques will have great influence in all aspects of our life.

Existing System:

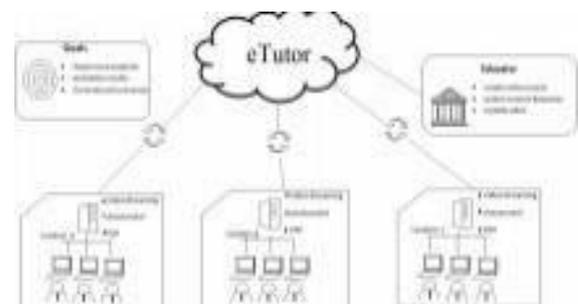


Fig. 2 Existing system used for Content based Systems

Above figure which is an online web based education system and learns how to teach a course, a concept or remedial materials to a student with specific context in the most efficient way.

Basically for the current student, eTutor learns from its past interaction with students with similar context, the sequence of teaching material that are shown to these students, and the response of these students to the teaching material including the final exam scores, how to teach the

course in most effective way. This is done by defining a teaching effectiveness metric, referred to as the regret, that is the function of the final exam score and time cost of teaching to the student, and then designing a learning algorithm that learns to optimize this metric. This tradeoff between learning (exploring) and optimizing (exploiting) is captured by the eTutor in the most efficient way, i.e., the average exam score of the students coverage to the average exam score that could be achieved by the best teaching strategy. We illustrate the efficiency of the proposed system in a real-world experiment carried out on students in a DSP class. The following fig 3

Proposed System Architecture

In order to achieve better domain results, researchers combined both techniques to build Hybrid domain systems, which seek to inherit vantages and eliminate disadvantages. In general, hybrid recommenders are systems that combine multiple recommendation techniques together to achieve a synergy between them. Although there exist a number of recommendation approaches that are practical to merge (i.e. Collaborative, Content-based, Demographic and Knowledge-based Recommender), our work will mainly focus on the combination of CF and CBF techniques. The proposed architecture is shown in Figure 3.3

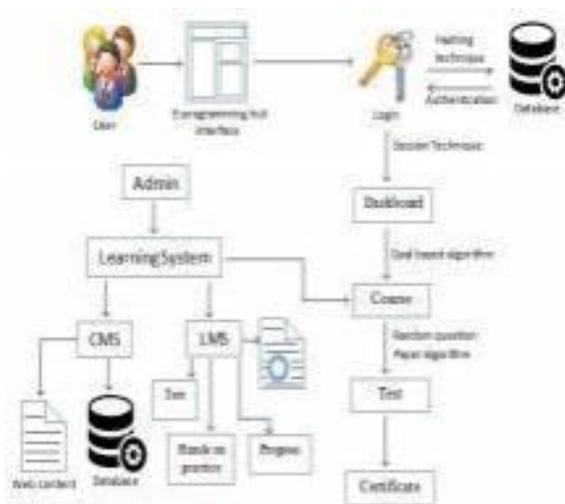


Fig. 3 Proposed system architecture

There are three main entity's in E Learning system are as follows:

The administrator, instructor, or user requests the login page and enters the username and password. The system verifies the credentials and checks whether the user is authorized or not. If the user is authorized then he can access the pages, otherwise a notification will be displayed to inform that the access is failed. The web classes contain the methods

and functions used to access the database. The web configuration component is used to configure the system functionality and to specify the application settings.

Requirement for implementation Techniques

1. Session Technique:

Session Tracking is a way to maintain state (data) of an user. It is also known as session management in servlet. Http protocol is a stateless so we need to maintain state using session tracking techniques. Each time user requests to the server, server treats the request as the new request. The techniques in this category are adapted to the individual needs, interests and preferences of user or society. They are tools for suggesting items to users in this domain. Various techniques in this category are listed here. These techniques have various advantages and are used extensively in literature. Basically there are four techniques which can be used to identify a user session.

- a. Cookies
- b. Hidden Fields
- c. Session Tracking API

Cookies, Hidden Fields involves sending a unique identifier with each request and servlets determines the user session based on the identifier. Session API uses the other three techniques internally and provides a session tracking in much convenient and stable way.

a. Cookie

Cookie is a key value pair of information, sent by the server to the browser and then browser sends back this identifier to the server with every request there on.

There are two types of cookies:

1. Session cookies - are temporary cookies and are deleted as soon as user closes the browser. The next time user visits the same website, server will treat it as a new client as cookies are already deleted.

The following fig 3.4a [8]

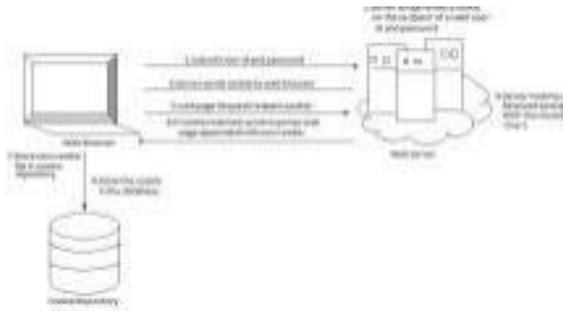


Fig. 3.4(a) Cookie for session tracking b. Hidden Field

Hidden fields are the input fields which are not displayed on the page but its value is sent to the servlet as other input fields.

For example

```
<input type="hidden" name="sessionId" value="unique value"/>
```

is a hidden form field which will not displayed to the user but its value will be send to the server and can be retrieved using `request.getParameter("sessionId")` in servlet.

c. Session Tracking API

Servlets provide a convenient and stable session-tracking solution using the HttpSession API. This interface is built on the top of above discussed approaches. Session tracking in servlet is very simple and it involves following steps
 Get the associated session object (HttpSession) using `request.getSession()`. To get the specific value out of session object, call `getAttribute(String)` on the HttpSession object. To store any information in a session call `setAttribute(key,object)` on a session object. To remove the session data , call `removeAttribute(key)` to discard a object with a given key. To invalidate the session, call `invalidate()` on session object. This is used to logout the logged in user.

2. Automated question paper

generation Examination is the process which tests users on what knowledge they have gained during the course of time. This exams tells us how much the user have stacked the e-knowledge along with hands on practise and can remember it for a longer period of time. To test the users on the course they have done, a set of multiple choice questions have been added to the database by the instructor. This database is called when the user finishes the course completely, i.e. the user has to complete the course 100% only then, the user can appear for the exam. Once the user applies for the exam, user will have to face few mcq's. These mcq's

contain theoretical as well as programming related questions. These mcq's are called on the users exam page in a random format. This is done using the Random Question Paper Generation technique. This technique randomizes the questions and are put forward on the users exam page. After the submission of the exam, the user will come to know the result if the user is passed or failed. Thus the quality of the exam questions produced by the instructor would determine the quality of the students produced by the institutions. Preparing exam questions is a challenge in traditional system, but it is way easy due to random question paper generation algorithm. This technique does not allow duplication or repetition of the question of paper for the users. So this technique generates unique question paper for all the users. This system consists a highly efficient random algorithm which uses an array to store randomly generated numbers. The questions are then selected against these array elements, hence ensuring unique question papers for all the users. This technique can be seen in the following fig 3.5b [10]

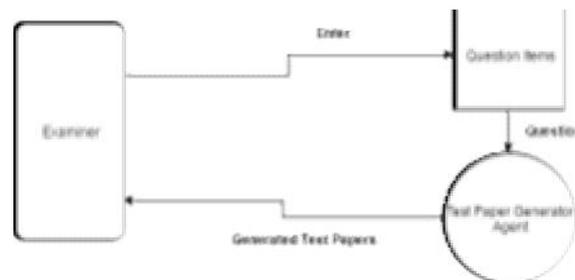


Fig. 3.5(a) Random Question Paper Generation Technique

3. Hashing Technique

Hash algorithms are one way functions. They turn any amount of data into a fixed length "fingerprint" that cannot be reversed. They also have the property that if the input changes by even a tiny bit, the resulting hash is completely different . This is great for protecting passwords, because we want to store passwords in a form that protects them even if the password file itself is compromised, but at the same time, we need to be able to verify that a user's password is correct.

The general workflow for account registration and authentication in a hash based account system is as follows:
 The user creates an account.

Their password is hashed and stored in the database. At no point is the plain-text (unencrypted) password ever written to the hard drive.

When the user attempts to login, the hash of the password they entered is checked against the hash of their real password (retrieved from the database).

If the hashes match, the user is granted access. If not, the user is told they entered invalid login credentials.

Steps 3 and 4 repeat every time someone tries to login to their account.

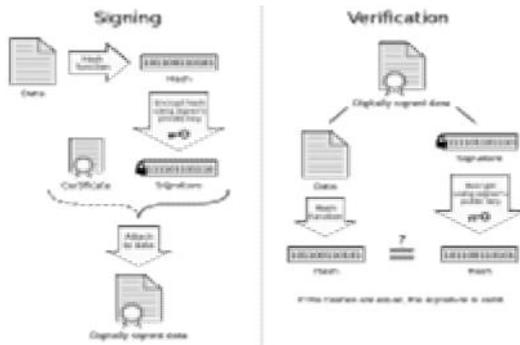


Fig. 3.5(b) Hashing Technique for authentication

4. Goal based algorithm

Goal based algorithm is an algorithm used in e-programming hut that defines a specific goal for the course. The goal for the user is to go through all the chapters, sub-chapters and perform set of exercises for the sub chapters. The user cannot jump on to next chapter or sub-chapter until and unless current chapter and its sub chapters exercise is completed. Once all the chapters of the course are done, the user can apply for the test. The user can only give the test, if the goal of completing 100% course is achieved. This makes us understand that the user is thoroughly studying the course on our site. The exercises are prepared in such a way that the user has to make changes according to the given conditions and the output of the programs should match the output that is saved in the database. If the output matches, the user can go to the next sub-chapter. Hence the goal is attained, and knowledge is gained by the user.

5. Programming Compiler

When the user is practising java language, the java compiler creates 2 files namely filename.class and filename.java and stores in the specified paths. When the user is practising c# language, the compiler creates 2 files namely filename.cs and filename.exe. When the user is practising VB language, the compiler creates 2 files namely filename.cs and filename.exe. Then the output of the program is checked with the expected output of the program that is stored in the database. If the output matches, the user can click on finish

chapter and can move on to the next chapter or else the user has to get the expected output to get to the next chapter.

The client uses the resources of the server system and in return the server provides services to the client system. These services from the server are possible through iis manager and sql server authentication . IIS manager helps to publish the website on the serve. This server provides localhost ip address to the website to be published. Using this localhost ip address, the client can get access to the website and its server system. The sql server authentication is done by using user id and password of the sql server. The hosting requires data connectivity which is done using sql server authentication by applying its user id and password.

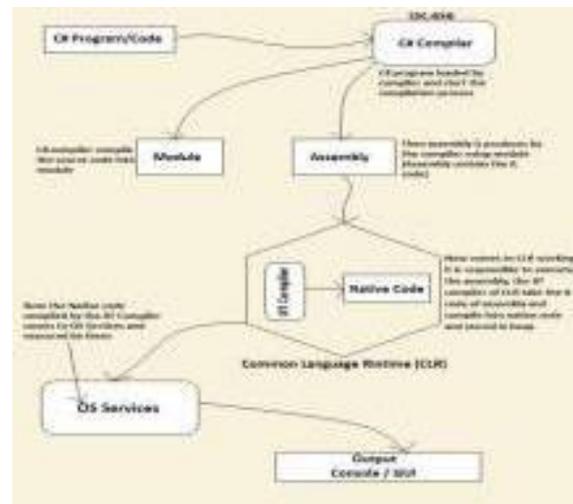


Fig.3.6 C# compiler for compilation of code

III. SUMMARY

In this report, the study of different domain techniques is presented. The different techniques such as Hashing Technique, Session Technique, Random Question Generator Technique and Goal Based Technique. With the advent of technology, life has become fast-paced. Most of the age-old systems are being upgraded in sync with the latest technological assets. This is to facilitate better learning and provide a hands – on experience. In this project E-learning hut will provide online courses of different languages for user. Languages will be divided into chapters, so that user can easily understand and access the topic. As you have access to the net 24x7, you can train yourself anytime and from anywhere also.

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