

IMPLEMENTATION OF MULTIPLE CHOICE EXAMINATION SYSTEM BASED ON AJAX TECHNIQUE

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Abstract: Nowadays, internet becomes one of the unavoidable parts of our lives as a result of wide spread usage of computer technologies. Recently internet is used from banking to trade, from education to entertainment. In this paper, ideas for efficient and fast usage of internet on education have been suggested and applied to implementation of multiple choice examination system. There are two contributions to the science in this paper. First one is the implementation of new software which uses the bandwidth efficiently. The last one is to introduce new mechanism for creating question bank.

Keywords: Multiple choice examination system, AJAX, DOM, XMLHttpRequest

Özet: Günümüzde bilgisayar teknolojisinin kullanımı yaygınlaştıkça internet hayatımızın vazgeçilmez bir parçası olmuştur. Son yıllarda internet bankacılıktan ticarete, eğitimden eğlenceye kadar birçok alanda yaygın bir kullanım alanı bulmuştur. Bu çalışmada internetin eğitim alanında kullanımının verimli ve hızlı bir şekilde yapılabilmesi için çözümler önerilmiş ve bu önerileri kullanan çoktan seçmeli sınav sistemi geliştirilmiştir. Bu yayının bilime iki önemli katkısı bulunmaktadır. Bunlardan birincisi bant genişliğini verimli şekilde kullanan bir yazılımın üretilmesi, diğeri ise verimli bir soru bankası üretme mekanizmasının geliştirilmesidir.

Anahtar kelimeler: Çoktan seçmeli sınav sistemi, AJAX, DOM, XMLHttpRequest

1. INTRODUCTION

The wide spread use of internet, which connects all computers and servers all over the world, has transformed society from “industrial” to so-called “information” society. Today, internet has become an indispensable part of life from banking to commerce and from entertainment to education on many issues. With the use of the internet, distance education that can be done remotely regardless of place is becoming widespread. In addition there is a serious need of machinery and of equipment in the laboratory for experimental study at formal education. Moreover, it is impossible to establish a laboratory environment in some areas. This is because Visualization of education by using the visual programming techniques has become valuable.

Unfortunately, the widespread use of the internet has brought some limitations. The bandwidth is at the beginning of these limitations. As, the key technology in the information society fast and accurate information exchange, development at the modulation technology is always out-stretch the bandwidth required. This is why, the efficient use of available bandwidth in recent academic and commercial applications are crucial.

Measurement and evaluation as a part of the computer-aided education, in other word examination and implementation of question bank connection with

examination, and the efficient use of the question bank are issues pending solution from researchers. Questions should be up to date as well as question bank must have greater diversity.

In this contribution, novel multiple choice examination system, which uses available bandwidth efficiently by using recent programming technologies, is introduced. Introduced system also has enhanced question creation mechanism that is developed in this paper. By using introduced question creation mechanism called “SUM” by the authors, creation of the up-to-date and comprehensive examination is made possible.

2. TECHNICAL BACKGROUND

The purpose of this project is to develop multiple choice examination system, which uses internet bandwidth efficiently as well as has dynamic question producing mechanism, by using recent web based programming technologies. As a result, this project has two goals. These are;

- To use internet bandwidth efficiently
- To develop both a question bank and a novel mechanism of which the production of new questions are easy

To reach first goal mentioned above, the Ajax technique conjunction with html DOM as well as XMLHttpRequest.

This section gives brief information about new web based technologies by which multiple-choice examination, that efficiently uses available bandwidth, has been developed.

2.1 Ajax:

Ajax is a technology developed by no-one. It is only a technique and consists of many technologies. Ajax as a method is an approach which gives ability to user to request from internet browser in an asynchrony manner. In addition partial updates are also possible by using ajax.

In the conventional web applications, user requests from browser to bring all page content. When user selects anything from uploaded page or fills a form in that page, server sends whole page again [1].

In ajax technique, when user acts or fills on/in the uploaded page, only selected part will be updated from the server by internet browser [1].

2.2 Html DOM:

Html DOM is used in ajax method both to dynamically update the page and interactive usage. Thus Html DOM transfers the conventional web page from ordinary to intelligent document. Therefore the document can be capable of doing more action and presenting the response in the page as well without re-uploading whole page again [2]

2.3 XMLHttpRequest:

XMLHttpRequest is an interface between web server and internet browser to transfer text or XML information. It is also an application used in web browser script language. To access data is possible in a synchron or asynchron manner by XMLHttpRequest [3]. XMLHttpRequest is used to bring data from database or to rewrite data to database at background.

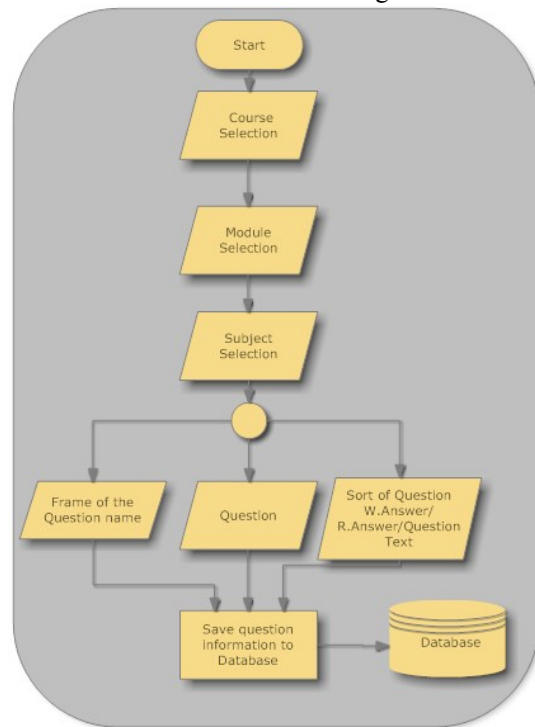
XMLHttpRequest is main part of the technology to develop web page by using ajax method. Most of the web pages developed by ajax such as Google Map and facebook use XMLHttpRequest.

3. MULTIPLE CHOICE EXAMINATION

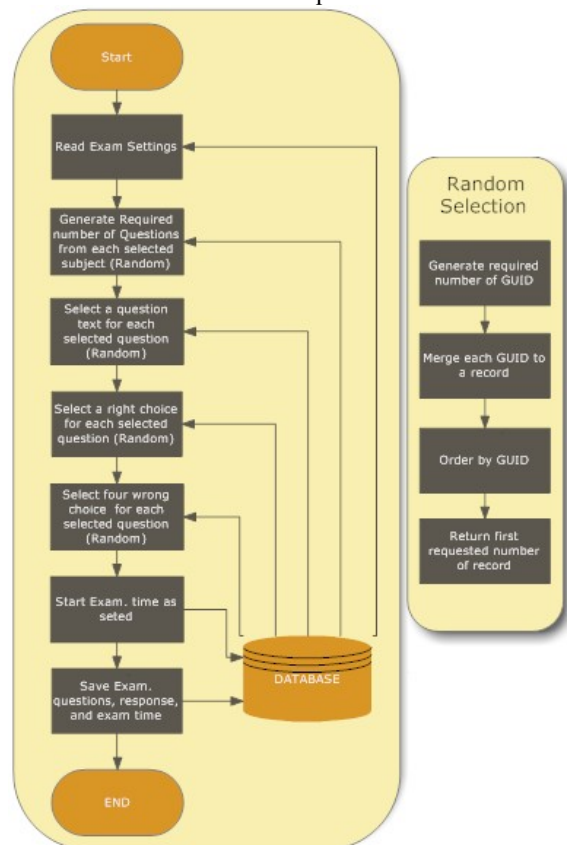
This section gives detail about new Questions production mechanism presented in this paper. After that the database framework of the developed system will be given.

3.1 Question Production Mechanism:

To make an exam, question bank is required. Developed system is capable of creation question bank easily. The newel mechanism has shown in Figure 1.



(a) Creation of question bank and entering questions



(b) Creating exam and random question section
Figure 1: Question Production Mechanism

As shown in Figure 1(a), it is possible that each question may have multiple text as well as mutable correct answers with many incorrect answers.

While questions are being created by developed mechanism, firstly one of the possible question frames is selected, then one of the possible question texts of the frame is chosen, after that one of the correct answers of the frame is chosen, finally desired numbers of incorrect answers of the frame are chosen. Each question is created by using the method explained above. Therefore it is possible to create many different questions even if same frame is used. Moreover order of the questions is different for very candidate. Thus it is almost impossible to cheat.

The next step of the mechanism is the creation of question bank. The block diagram of creating of question bank is shown in Figure 1(b). As seen clearly seen from Figure 1(b), exam start by using “start” button. Firstly examination setting is read from database, and then selected number of question is prepared by using “Random Selection” algorithm.

3.2 Feature of the Application:

Most important item of the examination is the answers of the students. These must be preserved incase of any problem such as connection lost. To ensure writing answers into database, recording is archived in three ways. These are;

- Record every data as soon as selected by using ajax
- Record all selected data at every time period
- Record all data when “END” button is pressed

Another point is to prevent user from cheating. To this, every student sees all questions in different order. In addition “Hide” button is also available for students to keep away their answers to be seen.

In the application, to achieve above features, there are 7 modules are implemented. These are;

- Course process
- Module process
- Subject process
- Question process
- Examination process
- Student process
- Exam evaluation process

3.3. Screen shot of the Application

To enter the system, login name which is student name and password is requires as shown in figure 2.



Figure 2: Login Screen

If your account has administrator privilege than Figure 3 is appeared.



Figure 3: Administrator Screen

To add course, “Ders Ekle” button is pressed then Figure 4 is shown.



Figure 4: Course addition screen

To delete a course “Ders Sil” button is pressed than Figure 5 is shown by the developed program.



Figure 5: Course deletion screen

To add or delete a module/subject to selected course, “Modül/Konu İşlemleri” bottom must be pressed. To add/delete a subject can be done as shown in Figure 6

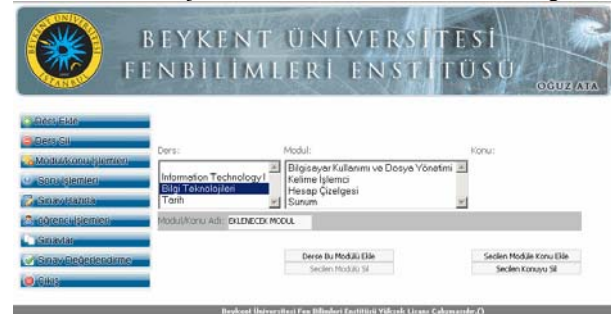


Figure 6: Addition of module or subject to selected course

- [Ders Ekle](#)
- [Ders Sil](#)
- [Modül/Konu İşlemleri](#)
- [Soru İşlemleri](#)
- [Sınav Hazırla](#)
- [Öğrenci İşlemleri](#)
- [Sınavlar](#)
- [Sınav Değerlendirme](#)
- [Çıkış](#)

1.Dersi Seçin:

- Information Technology I
- Bilgi Teknolojileri**
- Tarih

2.Modül Seçin:

- Bilgisayar Kullanımı ve Dosya Yönetimi
- Kelime İşlemci
- Hesap Çizelgesi**
- Sunum

3.Konuyu Seçin:

- Uygulamanın Kullanımı[14]
- Hücreler[5]
- Çalışma Sayfaları[1]
- Formüller ve İşlevler[7]
- Biçimlendirme[0]
- Grafikler[0]
- Çıktıları Hazırlamak[0]

4.Soruyu Seçin:

- Windows'un resim editörü aşağıdakilerden hangisidir?
- Windows'un hesap makinasına nasıl ulaşabiliriz?
- tam ekrandan çıkma simgesi?
- Temel ayarlar nereden yapılır?
- Windows'ta Alt-F4 tuşu ne iş yapar?
- [klasör] simgesi neyi ifade eder?**
- Windows'ta F3 tuşu ne iş yapar?

5.Soruya ait Metni Seçin:

- [M]
- [D] Klas uuml;r
- [Y]Dosya
- [Y]Bir uuml;st seviye
- [Y]Hi ccedil; biri
- [Y] Kısayol

Soru Çatısı:

[Oluştur](#)
[Sil](#)

Rich Text Editor

Path:

Soru/D.cevap/Y.Cevap

Soru Metni

Ekle

Sil

Değiştir

[Editörü Aç/Kapat](#)

Figure 7: Creation of the questions.

To add/delete a question frame to selected module of the selected course, "Soru İşlemleri" button must be pressed then Figure 7 appears.

It is impossible to shown all modules developed by the authors, therefore only a few number of modules are given in this contribution.

4. CONCLUSION

In this paper, new multiple choice examination system which uses available band width efficiently as well as having new mechanism was presented. Developed program is used at Beykent University and efficiency is approved.

References

- [1]. J. Keith. Bulletproof AJAX. New Riders, 2007
- [2]. Document Object Model (DOM).
<http://www.w3.org/DOM/>
- [3]. AJAX.
[http://en.wikipedia.org/wiki/Ajax_\(programming\)](http://en.wikipedia.org/wiki/Ajax_(programming))

CV's

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