

## Implementation of Web Based English Grammar Testing System

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### Abstract

*Web-based examination system (WES) is the examination system where examinations are held online via Internet. This paper presents the online examination system for testing English grammar. It is intended for testing English Grammar as Multiple Choice Questions online in schools and universities. The system is implemented for three English grammar levels, basic, intermediate and advance levels. The role of administrator is adding new question into the system. To add new questions, the question with three options including one right answer must be added. User needs to register to the system and login with by using registered user email and password to take exam and view result. On choosing a level test, user have to answer the questions within the time limit. When the user finished answering all questions, he or she can view the score and then apply the certificate.*

**Keywords:** Web Based Examination System, J2EE, MySQL, Web Server, Web Application

### 1. Introduction

Because of the accuracy and speed, Web Based Examination system is considered a fast developing examination system in today's world. Since online examination systems can reduce student's time in examinations, many organizations today are managing their exams online [5]. It can reduce the workload of teachers. Web Based examination system is the one which allows students or trainers to do exercise or tests through computer.

Student can enter to the system to take exam only with their valid username and password. The questions in the online Examination contains multiple choice questions and appropriate number of options. Questions will be randomized to ensure not to come the same set of questions to all student. The user can select only one option even if there are more than one correct answer.

The system provides time limit for the user to answering questions. The user will be shown their results when the examination is completed

### 2. Related Work

D.D.Sarkar et.al, presented the approach to design which is the architectural procedural using Java framework [2]. Their framework aims to separate business logic from presentation layer which leads to MVC architecture. J2EE provides the environment for developing enterprise applications or services using multitier architecture.

Embedded Device based Online Examination System was presented in [3]. If the number of students increase, more computers will be needed, which will lead to increase the cost. A keypad based embedded device has been designed as the solution to overcome this problem. It is intended to provide automated accurate and fast result with high quality system which can save the student's time.

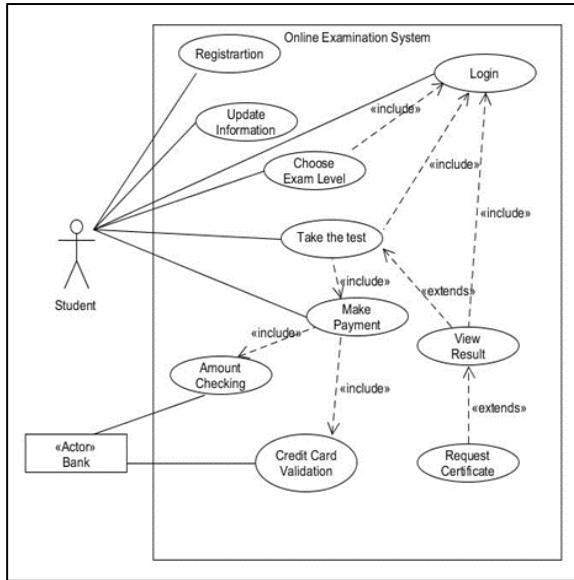
In [7] online examination system was designed and implemented for universities. Examination can be conducted via Internet using computer system because of online examination or web-based examination system. In their system, Browser/Server framework using Microsoft Visual Studio 2000 was used for interface, C#3.5 for coding. For data storage, Microsoft SQL was used.

In [6] the development of an online examination web application was reported Covenant University. That was used as a case study in this application. As the application, the system was tested on the university intranet so that students can test the examination system by answering sample multiple choice questions for some general courses. JSP (Java Server Page) Model development model was used to develop online examination system with the combination of client side and server side, development technology. [9]

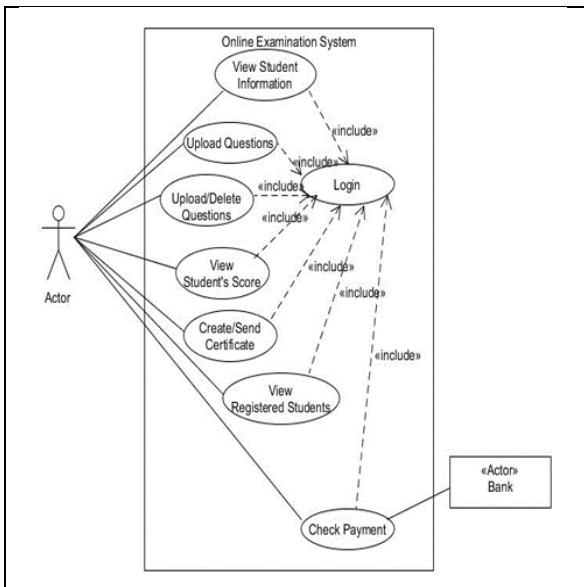
### 3. Behavioral Model of Web Based Examination System

Web Based Examination System is described by using use case diagrams Figure 1 and Figure 2 as the behavior model. According to user roles, behaviors of the system can be depicted in two categories: one for students who want to take the test of the system and

another for the admin of the web site of online examination system.



**Figure 1. Client Side of Web Based Examination System**



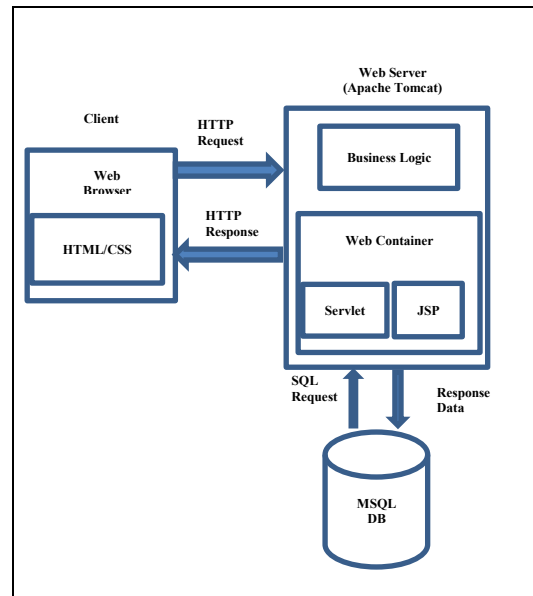
**Figure 2. Server Side of Web Based Examination System**

#### 4. Architecture of the Web Based Examination System

Sun provides J2EE, Java Platform for implementing multi-tier enterprise applications. J2EE provides a complete set of services for components of enterprise applications and handles the details of application behavior. This makes it simple to develop enterprise applications. [1].

J2EE is a Java platform-based architecture which makes simplification for enterprise solutions to develop, deploy, and manage related complex problems. J2EE can reduce the cost and complexity of the development in

multi-layer application because it provides a unified development platform. Furthermore, it can be used for the integration of existing applications, Enterprise JavaBeans, Servlet and JSP. With the good guidance, it also supports the package and deployment of applications and adds the directory support in order to enhance the security system and improve the performance. [8]



**Figure 3. Architecture of Web Based Examination System**

Multi-tier J2EE Web Application Architecture was used in the system. The tiers are Client tier, Presentation Tier, Business Logic Tier and the Data Persistence Tier. Each Tier has its specific function. Figure 3 is the depiction of the Architecture of Web Based Examination System.

##### 4.1. Client Tier

The client tier provides smooth communication between the users and the server through the user interface. The users from the client machine can access by using the Web Browser, which means that development of client programs is not needed in web applications. That is the main important attracting feature of Web Applications. Between the web browser of the client machine and the server, HTTP request/response is sent and back for request and response. The HTML technology is used in the client tier. [4]

##### 4.2. Presentation Tier

The presentation tier is also called the Web tier and its function is to deal with the HTTP request sent from the client side and produce dynamic HTTP response according to the Web server which is Servlet and JSP.

##### 4.3. JSP

JSP technology is a new dynamic web application technology standard. JSP web page is composed of the traditional HTML web page files (\*.html, \*.htm), which

### 4.3. JSP

JSP technology is a new dynamic web application technology standard. JSP web page is composed of the traditional HTML web page files (\*.html, \*.html), which are inserted Java program files (Scriptlet) and JSP tags. Consequently, it comes into being a dynamic page on the server according to the client request.

### 4.4. Servlet

Servlet is a small Java program on the server side and it must realize Http Servlet interface. It can respond and deal with client's request through Servlet API, and even it can bring a dynamic HTML page.

### 4.5. Business Logic Tier

For enterprise application programs, business logic tier is for realizing domain business logic of application being developed.

### 4.6. Persistence Tier

The persistence layer describes the business data of the application program, and simulates the real entity and the business flow of the organizations, so it is the foundation of the enterprise application. The business object is the simple software abstract of the real world entity, which represents some concrete object in the domain.

## 5. Implementation of the Online Examination System

A web application framework, which can reduce the overhead associated with common activities used in Web development can support for the development of dynamic websites, web applications and web services. [2].

### 5.1 Client Side

Home Page of the system, figure 4, describes the detail information about the online examination system for English Grammar. In this system, three levels for testing English Grammar is provided so that the user can choose their appropriate level for testing the skill.

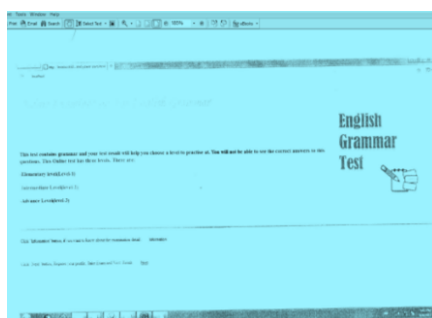


Figure 4. Home Page

### 5.2 Information Page

The detail information about the exam such as exam fees, registration dates, exam date and exam time will be shown on the Information Page of the system. Users can make the online payment by using credit card. If the user gets the marks which is greater than 50 marks, they will pass their exam. Otherwise, user is defined as he or she fails the exam. Figure 5 is the Information Page of the system.

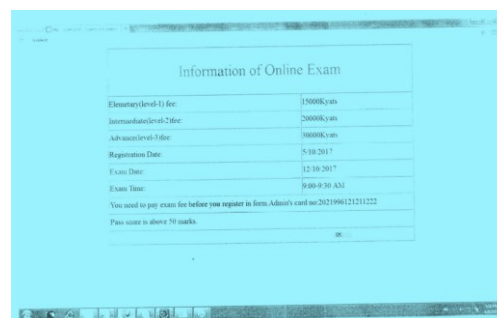


Figure 5. Information Page

### 5.3 Exam Level Page

Before the user answer the test, it is needed to choose the level of examination on the Exam Level Page, Figure 6. The WES presented in this paper provides three levels: the elementary, the intermediate and advanced levels. For the exam questions, English Grammar Books such as IELTS English Grammar books, English Grammar in used are used.

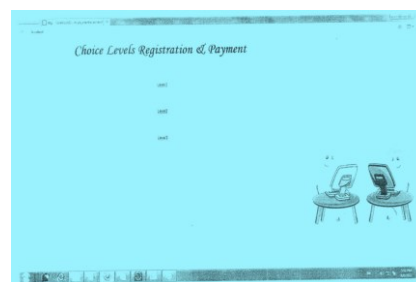


Figure 6. Exam Level Page

### 5.4 Registration Page

For anyone, who wants to take the examination, registration is compulsory. The user must fill the required information to register for the examination. These registration form will be provided on Registration Page of the system, which is described in figure 7. Basic details for student such as Name, E-mail, Address, Password, Gender, etc. are essential to fill in the registration form for successfully sing up to the system. The user is provided to choose the levels that they want to test their proficiency in English grammar.

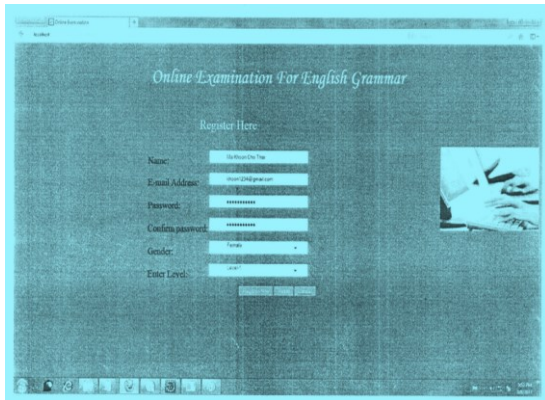


Figure 7. Registration Page

### 5.5 Payment Page

The user has to make the payment by using credit card to take the exam after registration is successful, figure 8.



Figure 8. Payment Page

### 5.6 Exam Page

The system allows only registered users to take the exam by their registered user name and password. The elementary, the intermediate and the advanced levels exams are provided as the three levels of exam as in Figure 9. Users can take the exam according to the level that they registered at the registration time. The system provides the 100 multiple choice questions which have to be answered within 2 hours for one exam paper. User have to choose the answer by clicking A or B or C. After taking the examination, the users can view their exam result after examination. The application for certificate is allowed only for the users who pass the exam.

### 5.7 Server Side

As the administrator of WES, the information of students who are registered to take the exam can be viewed. Uploading of exam questions and updating or deleting the exam questions are also the functions of the administrator. Viewing the scores of the students and

issuing of certificates for the students who pass the exam will be performed as the administrator's role.

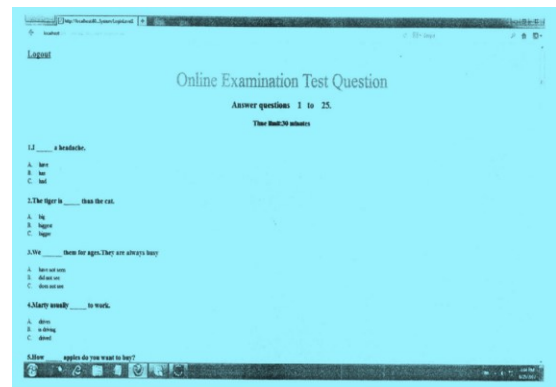


Figure 9. Question Page

## 6. Conclusion

In this paper, implementation of Web Based Examination System was presented. J2EE Architecture was used for system architecture and for implementation J2EE technologies (Servlet, JSP) were used. For the storage of data, MySQL database was used. This system can provide many benefits to the users who want to test their English Grammar skills. The user can easily find out the appropriate level of exam according to their competency. By using the system, users can take the exam and can make practice from anywhere which saves time of going to exam center to take the exam. Moreover, the system is intended to become a useful application for education environment. The system is tested with 10 examinees simultaneously and can provide good response. Since the system allows only valid users to access the system according to the user roles: Administrator and Student, security is based on the individual user name and passwords, Web Based Examination System can be easily adopted according to the needs of universities.

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