

ONLINE EXAMINATION SYSTEM IN BANGLADESH CONTEXT

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Abstract: The main purpose of this paper was to develop an online examination system suitable for both Academic and Non-Academic examinations. Prior to start the design and development of the system three online examination systems were analyzed to make the newly developed system more flexible and user friendly in the context of Bangladesh. Three Data Flow Diagrams (DFDs) and one E-R diagram have been developed to represent the whole system. Different features of the online examination system are discussed in this paper. The features include user's registration, examination instruction, valid time of examination, time reminder, submission of the answer script, and release of the examination results. The system enables the admin or super admin to create a test from a question bank that comprises different subject areas. Testing of the system is done with ten users with a test that included 20 questions from four subject areas such as Bangla, English, General Knowledge, and Science and Technology. It is a multilingual system that permits users to conduct tests in their mother language.

Keywords: ICT, Data Flow Diagram (DFD).

1. INTRODUCTION

With the proliferation of the internet technology, online examination system has become an effective component to traditional test in many developed countries. It is web based, efficient, flexible and adaptable, which can provide a new and open mode of examination meeting the needs of various Academic and Non-Academic organizations. The examination consists of different types of multiple choice questions. The answers are evaluated and the marks obtained are stored in the database while the examiner can get the results immediately from the system in various forms such as general mark list, and ranking of participants. The main features of an examination system include instructions for the participants, accessibility of examination content, valid time allocation, submission ways and result release [6].

In Bangladesh application of communication technology increased enormously in the recent years. It is perceived that the government and non-government organizations are

working in numerous sectors such as education, governance, banking and commerce, rural development and poverty reduction, and health using ICTs to reach citizens more competently and to bring relevant services closer to the abilities of the citizens. The number of internet users has increased greatly in the past few years in the country, and most of the universities have good internet facilities [3]. In spite of several limitations there is evidence that eLearning component has been integrated by a university in Dhaka city with their face to face mode to give students an environment for interaction [2]. It indicates that higher education institutes moving towards using modern technologies to meet the demand of the students and familiarise them with the new technologies. These activities aligned with the revised ICT policy of Bangladesh-2009 that all universities provide international standard ICT education [1]. Online examination is a new technology which can be implemented in the context of Bangladesh to avoid risk of leakage of question papers and ensure transparency of the results.

The main intention of this paper is to develop an online examination system with suitable features and lack of ambiguities. The system allows creating a test from the question bank of the system and conducting Academic and Non-Academic examinations in English as well as Bangla.

2. THE STUDY

The objectives of the study are to:

- i. Analyse features of several online systems who are conducting tests online for different purposes.
- ii. Design and develop an online examination system in the context of Bangladesh.

The features of three online systems such as Expertrating (www.expertrating.com), Odesk (www.odesk.com), and Liit (www.liit.com) have been analyzed to have broader understanding of online examination and build a system which is user friendly, flexible and secure. These online systems analyzed for this study conduct online tests for various purposes. The features studied were then summarized to design and develop a new system. Different tools were used to develop the online examination system. These are XHTML, CSS, Photoshop, Micromedia Dream Waiver, Micromedia Fireworks, PHP, MySQL, Apache Server, and Symfony 1.4 framework.

The system consists of three components such as Admin, Super Admin, and Participants (users). Admin indicates the system administrator who is responsible for

ensuring security and smooth operation of the system while the super admin (Teacher/Department Head/ organization leader) is responsible for making and editing tests, managing examination, producing results etc. Participants are examinees of the system that is for whom test is being conducted. Data Flow Diagram (DFD) for each of the three components has been developed which enables operations of the entire system. Additionally the E-R diagram of the system expresses the overall logical structure of the database graphically.

3. DESIGN OF THE ONLINE EXAMINATION SYSTEM

System design focuses on the technical and implementation concerns of the system. Few steps can simplify the task of designing coding of a system dramatically. Following steps were completed for designing the system.

Step1: Identify precisely the core functionality & the system design using data model such as ER data model.

Step 2: Normalization of the system precisely and drawing DFD of the system.

Step 3: Explain precisely the core functionality & the system design using DFDs.

Additionally, database design was one of the main components of the online examination system. The collection of data usually referred to as the database. One or more large structured sets of persistent data (questions in the present system) usually associated with software to update and query the data. A simple database might be a single file containing record, each of which contains the same set of fields where each field is certain fixed width. Each record in the online examination database is composed of the important elements of information of a particular item and each record is composed of a set of field [7]. A database system is designed to manage enormous information of online examination. The database system provides safety of the information store, despite system crashes or attempts at unauthorized access [8]. It helps sharing data among different users, and avoiding possible anomalous result

Designing web page of the online examination system was another important component where contents are placed in a logical sequence and images with appropriate resolution so that the users/ visitors may get clear understanding of the purpose of the online examination system. The web page of the system is a resource of relevant information for the users that is suitable for the World Wide Web which can be accessed through a web browser.

This information is kept in XHTML format, and may provide navigation to other web page via hypertext links. The web page is stored on a remote web server.

An E-R diagram and three data flow diagrams (admin, super admin, and participants) have been developed to express the logical structure of the system and represent the information flow within the system respectively. In fact the E-R diagram is the blue print of the database and reflects the data required for each of the three components (admin, super admin, and participants) of the system.

Of the three DFDs the data flow diagram of super admin is given in Figure 1. The diagram indicates that the system attached lot of responsibilities for super admin. These include making examination test, editing tests, setting timer for examinations and time reminder, release of results, making grade list or participants' ranking list.

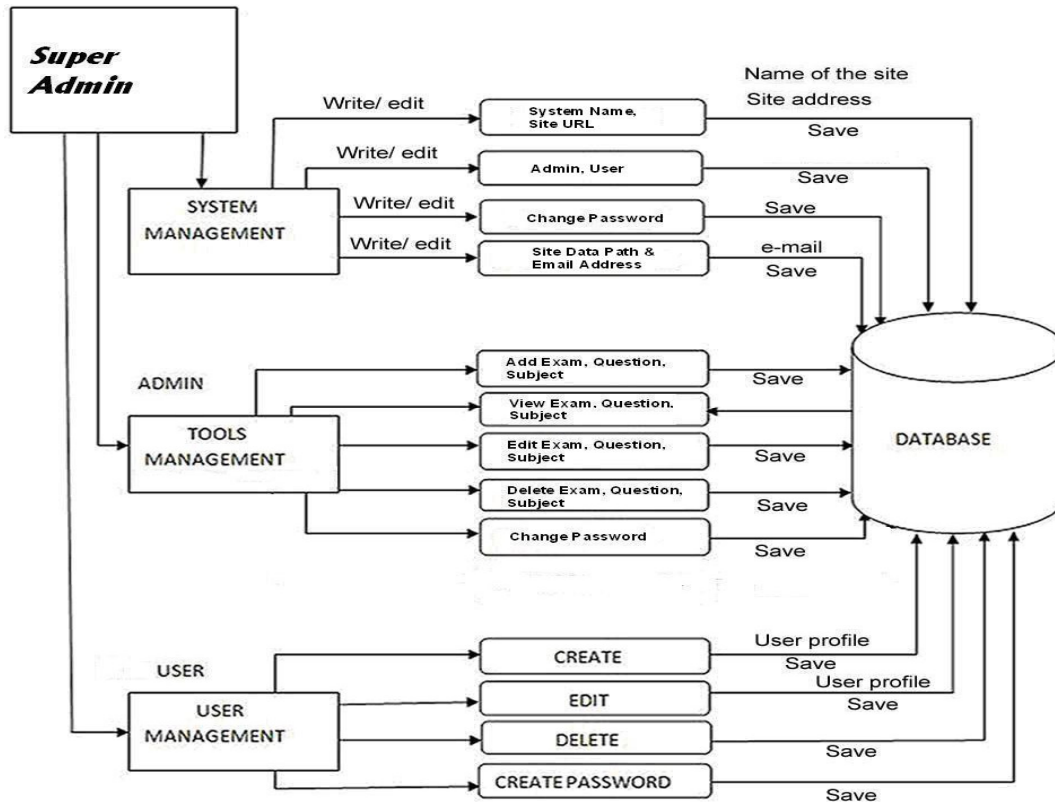


Figure 1. Data Flow Diagram of Super Admin

The online answer script of each participant will be stored in the system database which can be retrieved by the super admin if necessary.

4. FEATURES OF THE ONLINE EXAMINATION SYSTEM

The features of three online systems (Expertrating, Odesk, and Liit) were analyzed to understand the design and components, and relevant features of the systems. In fact, these three systems conduct online test for users and release instant results for the users for registration and make further working relationship with them. Apart from organizing online test, these websites offer online courses, tutorials, training, eBook to individuals and job seekers.

The purpose of the newly established system is different from the above systems. The online system presented in this paper may be used for both Academic and Non-Academic purpose. Universities and Academic Institutions may use this system for conducting admission test while the course teachers can use the system for class test or any other competitive examinations based on multiple choice questions. The system can be used for recruitment purposes for example teachers' recruitment, BCS preliminary test, bankers recruitment etc to manage the examination more efficiently and make more transparent and hassle free, and provide results immediately after the examinations. Additionally, this system can also be used for conducting different model tests or mock tests. Some features of the system are given below.

4.1 REGISTRATION

The home page of the system is designed with the registration box for participants, sign in box for admin and super admin and information for participants about the system. The data required for user's registration are participant's name, institution, date of birth, email address, and password. Participants can go to the examination instruction page after registration. The URL of the Online Examination System is www.onlinetestbd.us. A view of the home page of the system is given in Figure 2.



Figure 2. Home Page of the Online Examination System (www.onlinetestbd.us)

4.2 EXAMINATION INSTRUCTION

Examination instruction page includes examination contents, rules, and other relevant information that should be paid attention to. In general, following aspects such as total questions, total marks/scores, passing scores, reduction of score for wrong answer, time limit etc are included in the instruction page. The examination questions (test) will be available to the users at the time of examinations. This will ensure security and reduce stress of leakage of question papers before examination.

4.3 VALID TIME OF EXAMINATION

There will be certain time limit for a particular examination as set by the admin or super admin. The participants can only start the examination when the time starts and able to continue within the time limit. This means that the system allows the admin or super admin to make the test active at the right time of examination just by clicking on the active icon. The test will be unavailable when the time expires.

4.4 TIME REMINDER

The timer of the system will tell the participants how much time is left for their examination. It will also tell the participants to submit their answer script when the time expires. The timer will be visible on the screen until the examination time is ended.

4.5 SUBMISSION OF THE ANSWER SCRIPT

The system provides the opportunity to submit the answer script that is all (questions) at a time rather than one question at a time. This opportunity allows the students to edit their

answers within the time limit of the examination. The answer script will automatically be submitted when the time expires even if the users hold off to submit the answer script.

4.6 RELEASE OF EXAMINATION RESULT

The results can be calculated automatically when the examination is over and the participants may view their own results. The system will show the individual participant's all questions with correct and wrong answers. The super admin can produce the result sheet or ranking of the participants as per their requirements.

5. TESTING OF THE SYSTEM

Successful testing of a computerized system enhances its acceptance to the users and adds values for implementation in real ground. Testing of the system was done with 10 participants (users). After registration the participants were given a test that included 20 questions. The questions were selected randomly from the question bank of the system from four different subject areas such as Bangla, English, General Knowledge, and Science and Technology. The sample test used for the testing is given in Figure 3. Out of ten questions two displayed in the figure below.

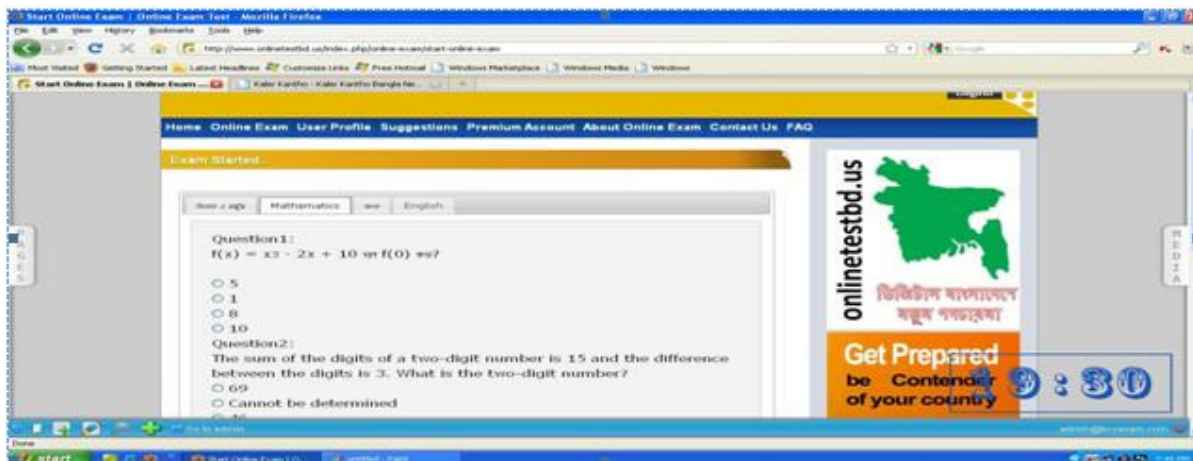


Figure 3. Sample questions used for testing of the Online Examination System

A result sheet or merit list of all ten participants was produced from the system (Figure 4). The result sheet comprises ID of participants and email address, total questions and correct answers, and total scores (value). The 'value' column indicates position (ranking) of the participants.

ID	Exam	Quiz user	Value	Questions	No correct	No question	Timetaken	Created at	Updated at
4	Online Test 01	nurbiplob@yahoo.com	100	20	20	20:00	May 9, 2012 10:57 AM	May 9, 2012 11:07 AM	
5	Online Test 01	mehedihasan111@yahoo.com	100	20	20	20:00	May 9, 2012 10:57 AM	May 9, 2012 11:06 AM	
16	Online Test 01	tpu007bd@gmail.com	100	20	20	10:00	May 9, 2012 10:57 AM	May 9, 2012 11:11 AM	
20	Online Viva 01	nurmehedi@yahoo.com	100	20	20	20:00	May 9, 2012 10:57 AM	May 9, 2012 11:07 AM	
21	Online Test 01	sharifutsust@gmail.com	100	20	20	15:00	May 9, 2012 10:57 AM	May 9, 2012 11:07 AM	
8	Online Test 02	shohef_kmu@yahoo.com	95	19	20	9:9	May 9, 2012 10:57 AM	May 9, 2012 11:09 AM	
10	Online Test 01	jrcdas@gmail.com	95	19	20	15:00	May 9, 2012 10:57 AM	May 9, 2012 10:43 PM	
17	Online Test 01	9097876@yahoo.com	95	19	20	18:50	May 9, 2012 10:57 AM	May 9, 2012 10:42 PM	
3	Online Test 01	tanindwin83@yahoo.com	90	19	20	18:50	May 9, 2012 10:57 AM	May 9, 2012 10:42 PM	
7	Online Test 01	midsabid531@gmail.com	90	18	20	20:00	May 9, 2012 10:57 AM	May 9, 2012 10:42 PM	

Figure 4 Merit list of ten participants

The system also allows individual participants to view the complete results of his/her test immediately after the examination that is, correct and wrong answers.

CONCLUSION

The Online Examination System is an innovation in the context of Bangladesh. Universities, government and non-government organizations may take the advantages of this system. It will boot transparency of the examinations, reduce the risk of leakage of examination questions due to control of only the super admin, and provide opportunity for publishing results immediately after the examinations. Apart from these facilities, large number of participants may sit for the examination from different geographical locations (for example district headquarters) in Bangladesh simultaneously. It will save their time and money as well as release them from travelling hassle. However, ensuring security of the online question bank still remains a challenge for the admin and super admin of the system.

REFERENCES

- [1] Billah, M. & Raihan, A. 2009, 'Bangladesh National ICT Policy 2009: Features and Challenges', *Paper presented in the ICT Policy in Developing Countries Workshop*, University of Manchester, UK, available at: www.cdi.manchester.ac.uk/.../BillaICTPolicyWorkshop10.ppt
- [2] Islam, K. 2011, ICT in Learning: DIU Initiative, *The Independent*, July 01, Dhaka.

[3] Islam, Y. 2011, 'Tertiary Education in Bangladesh-Brief History, Problems and Prospects', *International Journal for the Scholarship for Teaching and Learning*, 5(2), available at:

http://academics.georgiasouthern.edu/ijstl/v5n2/invited_essays/PDFs/Islam.pdf

[4] MySQL. (n.d.): Retrieved on February 02, 2010 from <http://www.mysql.com/>

[5] PHP (n.d.): Retrieved on January 05, 2010 from <http://www.php.net/>

[6] Wondershare, n.d, 'What features should be included in online exam system', Retrieved on 15.04.2012 from

<http://www.sameshow.com/quiz-creator/article/online-examination-system.htm>

[7] Gehani, N. Summit, N.J. 2006, *Principles and practice using MySQL* (1st ed), Silicon Press, India.

[8] Saltzer, J.H. & Kaeshaek, M.F, 2012, *Principles of Computer System Designing: An Introduction*, Elsevier, UK.