Automatic Test Paper Generator with Shuffling Algorithm

Rasika Dhondibhau Dhavale[1], Dr. M.Z.Shaikh[2]

M.E. Student, Department of Computer Engineering, Bharati Vidyapeeth College of Engineering, Assistant Professor,

Department of I.T./C.S., ICLES' Motilal Jhunjhunwala College of Arts, Science and Commerce, University of

Mumbai, Navi Mumbai, Maharashtra, India[1]

Principal, Bharati Vidyapeeth College of Engineering, University of Mumbai, Navi Mumbai, Maharashtra, India[2]

ABSTRACT: Examination process is an important activity for educational institutions to assess student performance. Thus the nature of the exam questions would determine the quality of the students produced by the institutions. Preparing the exam questions is time consuming. Thus with the help of this paper we present the solution in form of Automatic Test Paper Generator System which makes use of a randomization technique. This system includes several modules like Login Module, Professor Module and Administrator Module. The Professor needs to specify the Department, Semester, Subject, Question, Weight age and Unit number and from the entered input, the examination paper will be generated automatically. The system shows characteristics like simple operation, a good interface, excellent usability, and high stability along with reliability.

KEYWORDS: Automation, Test Paper Generation, Randomization, Administrator, Database

I. INTRODUCTION

In this modern world, there is a change from manual to automated systems for different aspects of education system. At every level of education, test is the fundamental process of education system. However the main problem is Professors need to invest a lot of time and energy in composing examination papers and also there is chance of paper leaks. So, automation is required in generation of test paper.

Automatic Test Paper Generator is special software which is useful to schools, Institutes, publishers and test paper setters who want to have a huge database of questions and generate test papers frequently with ease. This software can be implemented in various medical, engineering and coaching institutes for theory paper. This paper introduces the usage of shuffling algorithm in Automatic test paper Generator System. The main part of the shuffling algorithms is to provide randomization technique in test paper generator, thus different sets of question could be generated without repetition and duplication. You can enter unlimited questions depending upon the system storage, capacity and as per the requirement.
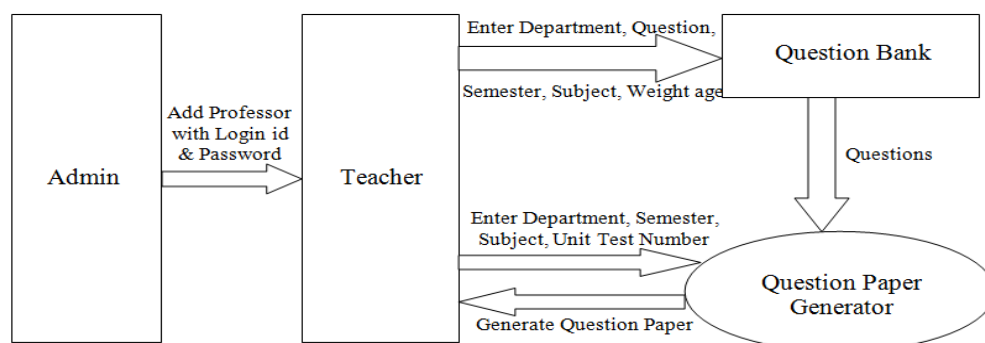

Fig.1. Working of Test Paper Generator

As shown in Fig.1. First Admin will add Professor and send login id and password to the Professor and store all the details of Professor to the database. Professor will enter questions in question bank by specifying Department, Semester, Subject, Questions and Weight age and also Generate Test Paper by entering Department, Semester, Subject and unit Number. Finally Test Paper is generated in text (.txt) format.

II. LITERATURE SURVEY

Automatic Question Paper Generator System (QGS) [1] which makes use of shuffling algorithm as a randomization technique. This system includes several modules like user administration, subject selection, difficulty level specification, question entry, question management, paper generation, and paper management. In Question Paper Generator System [2], administration of the database inputs set of question paper with an option of check box to tick the correct answer. More ever weight age of the particular question in terms of marks and hours and the complexity of the questions are determined. After this process whole question paper along with the weight age is stored in the database.

Semantic based Automatic Question Generation System [3] is using both Semantic Role Labeling and Named Entity Recognition techniques to convert the input sentence into a semantic pattern. The question types considered here are set of WH-questions like who, when, where, why, and how. Then a pattern matching phase is applied to select the best matching questions pattern for the test sentence. Automated Question Generation [4] combines several distinct tools from very different areas of information technology, among other clustering and classification units. Researcher is going to use NLP (Natural Language Processing) for automatic question generation system [5].

Automatic Question Generation system called G-Ask [6], which generates particular questions as a form of guidance for student learning. For generating question Semantic Role Labeller and NER (Named Entity Recognizer) is used to identify whether its Name, Location or Name of Organization. Once Question sentence is prepared, and then measures the resemblance between the Question sentence and each sentence from the Question knowledge based. Sort the obtained similarity values from other sentences and Get three keywords from three different sentences as a distracter values. The result of research was nearly 145 parsed sentences, there were 109 considered better for the keywords obtained from them. Shuffling algorithm for Automatic Generator Question paper System (GQS) [7] uses a randomization technique for organizing sets of exam paper.

An implementation of an automatic examination paper generation system [8] uses lightweight J2EE tools based on B/S architecture to design an auto-generated paper management system. With this algorithm, the user needs to identify the subject, the question type and the difficulty level. From this input, the examination paper will be generated automatically. In Automatic Question Generation Using Software Agents for Technical Institutions [9], the focus is to take input in form of a text file from user which contains of the text upon which the user desires to fetch questions; the output is produced in form of a text file containing questions based on Bloom's taxonomy.

III. PROPOSED SYSTEM

A. Steps involved in Automatic Test Paper Generator –
Step 1: When the application starts, Admin will add Professor to the database and give login id and password to each Professor.
Step 2: According to admin or Professor, the user validation takes place.
Step 3: After successful user authentication, the program asks for number of questions to be included in the test paper according to Department, Semester, Subject, Questions and Weight age.
Step 4: Database is created for storing questions which are entered by Professor.
Step 5: User will generate test paper by entering Department, Semester, Subject, weight age and unit Number.
Step 6: Then user has to click on the "Generate Paper" button to generate test paper. Test paper is generated in text (.txt) format.

B. Modules in Automatic Test Paper Generator:
  As shown in Fig.2. Modules are given below –
  1. Login Module
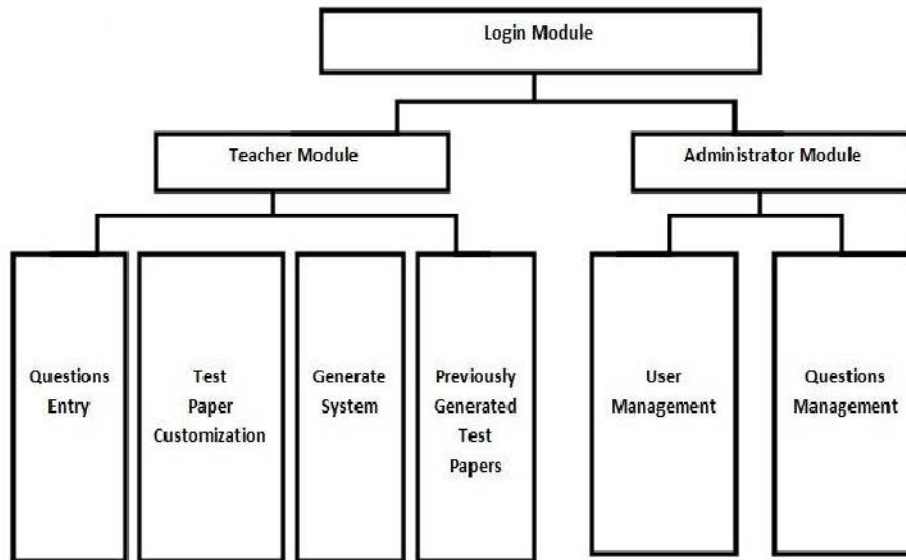 2. Administrator Module
  3. Teacher Module

Fig.2. Modules in Test Paper Generator

1. Login Module: Login Module is divided into two parts as Teacher Module and Administrator Module. In Login Module, Administrator as well as Professor will enter their credentials i.e. Login id and Password to access the proposed system.

2. Administrator Module: Administrator Module has two major roles: User Management and Question Management.

2.1 User Management – In User Management, First Admin will enter his Login id and Password and then he will add Professor to the system and send Professor's login id and password to the Professor's email id for accessing Automatic Test Paper Generator and details of Professor are stored in the database.

2.2 Question Management –Admin will manage questions according to the Department, Semester, Subject and Unit Test Number.

3. Teacher Module: Teacher Module has two major roles: Question Entry, Test Paper Customization, Generate System and Previously Generated Test Papers.

3.1 Question Entry –Professor will make question bank by entering questions according to Department, Semester, Subject, Questions and Weight age and this question bank will be store in the database.

3.2 Test Paper Customization – Since this system is generating paper in txt format, Professor can simply make changes in test paper. If Professor wants to change questions of the test paper, he/she can customize test paper by simply editing questions of test paper.

3.3 Generate System – Professor can generate test paper by entering Department, Semester, Subject, weight age and unit Number.

3.4 Previously Generated Test Papers – Professor can check previously generated test papers in the system by login into the system.

IV. ALGORITHM

Shuffling algorithms is a suitable and very effective way to implement for randomization of stored questions in the database. This algorithm checks for replication and repetition of the randomly generated questions. The nature of this algorithm is as followed, for a set of N (the total number of question in the database) elements for generating a random alteration of the numbers 1–N,

A. Shuffling Algorithm:

Step 1: Create an array of N locations.

Step 2: Generate random number.

Step 3: if (loc==0)

Store generated number
else
Compare the generated number with previous number in array.
if matching value found,
go to step 2;
else
Store the no in next location.
Step 4: Repeat step 2 for N numbers.
Step 5: Select questions from DB matching with values from array location one by one.

V. SIMULATION RESULTS

An Automatic Test Paper Generator is developed for Computer, Information Technology, Mechanical, Instrumentation, Electronics and Telecommunication braches of Engineering, at Bharati Vidyapeeth College of Engineering.

As shown in fig.3. Login Module has two parts as Professor Module and Admin Module. In Login Module, if Professor has his credentials then he will directly access the system else Admin will enter his credentials and then system will redirect to Add Professor Page.

Fig.3. Login Module

In Add Professor Page, Admin will add Professor to the system by entering User Name, Address, Email Id, Contact Number and branch. Then he will send Professor's credentials such as login id and password to the Professor's email id for accessing Automatic Test paper Generator as shown in fig.4.

Fig.4. Add Professor Page
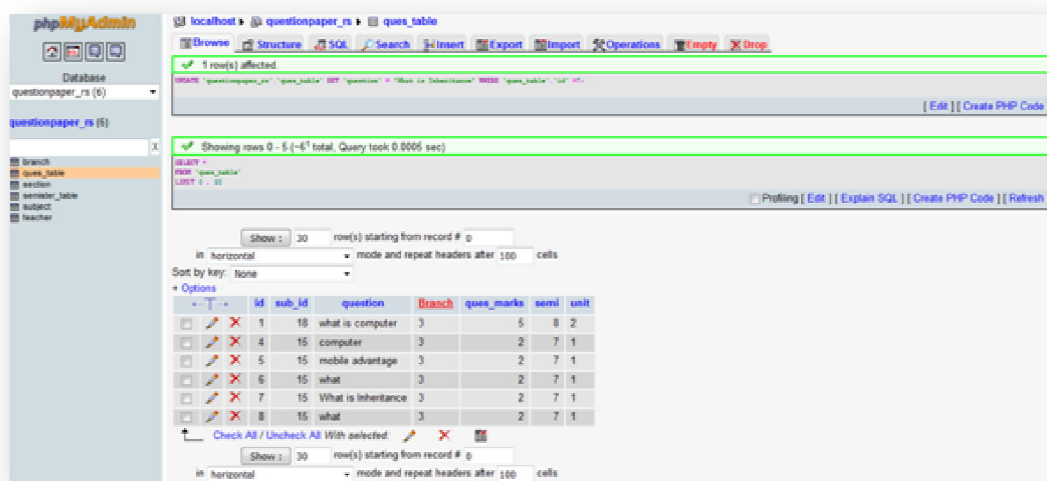
As shown in fig.5. Database is created for storing Professor's details which are entered by Admin.

Name	Branch	Email	Address	Contact
sd	Electronics	ladubah.elosys@gmail.com	dssa	1234567890
jau	Biomedical	a@gmail.com	mumbai	1234567892

Fig.5. Database for Storing Professor Details

Database is created for storing questions which are entered by Professor according to Department, Semester, Subject, Questions and Weight age as shown in fig.6.

Fig.6. Database for storing questions

This result shows that Admin will add Professor and send credentials such as login id and password to the Professor and store details of Professor to the database. Professor will enter questions in question bank by specifying Department, Semester, Subject, Questions and Weight age and entered questions are stored in the database.

The results for Test Paper Generation Module are yet to be obtained, as the system is under development.

VI. CONCLUSION AND FUTURE SCOPE

The main purpose of this application is to describe Automatic Test Paper Generator using shuffling algorithm for randomization. This system is web-based as well as desktop-based application system with several features mainly producing unduplicated sets of exam paper. Also there is no chance of paper leaks and wide portion coverage. So this system is very useful to School, College, Institutes and University. From usability point of view, this technique is user friendly and prepares test Paper in very less time in Easy Steps. As well as formatting can be done for the generated test paper.

Our future effort is to employ different types of randomization as well as different security techniques can be added in login page such as Color Pass Technique and to the database such as AES encryption algorithm.

VII.   ACKNOWLEDGMENT

REFERENCES

1. Kapil Naik, Shreyas Sule, Shruti Jadhav and Surya Pandey, "Automatic Question paper Generation System using randomization algorithm" IJETR, Vol.2, Issue 12, pp.1-3, Dec 2014.
2. Surbhi Choudhary, Abdul Rais Abdul Wahid, Shrutika Gawandi and Kavita Joshi, "Question Paper Generator System" IJCST, Vol.3, Issue 5, pp.1-3,Sep-Oct 2015.
3. Ibrahim Eldesoky Fottoh, "Semantic Based Automatic Question Generation using Artificial Immune System", IISTE, Vol.5, No.8, pp.74-82, 2014.
4. Bednarik L. and Kovacs L, "Implementation and assessment of the automatic question generation module", 3rd IEEE International Conference on Cognitive infocommunications, pp.687-690, Dec 2012.
5. Sheetal Rakangor and Dr. Y. R. Ghodasara, "Literature review of Automatic Question Generation System", IJSRP, Vol.5, Issue 1, pp.346-350, Jan 2015.
6. Ming Liu, Rafael A. Calvo and Vasile Rus, "G-Asks: An Intelligent Automatic Question Generation System for Academic Writing Support, Dialogue and disclosure, Vol.3, No.2, p. 101-124, 2012.
7. Nor Shahida bt Mohd Jamail and Abu Bakar Md Sultan, "Shuffling Algorithms for Automatic Generator Question Paper System", Vol.3, No.2, pp.244-248, May 2010.
8. Guang Cen, Yuxiao Dong, Wanlin Gao, Lina Yu, Simon See, Qing Wang, Ying Yang and Hongbiao Jiang, "A implementation of an automatic examination paper generation system", Mathematical and Computer Modeling, Volume 51, Issue 11-12, pp.1339-1342, June 2010.
9. Shivank Pandey and K.C. Rajeshwari, "Automatic Question Generation Using Software Agents for Technical Institutions", Vol.3, No.4, Issue 13, pp.307 - 311, Dec 2013.
10. Wikipedia (2010a).Randomization. http://en.wikipedia.org/wiki/Randomization
11. Wikipedia. (2010c).Shuffling algorithm. http://en.wikipedia.org/wiki/Shuffling_algorithm

BIOGRAPHY

Ms. Rasika Dhondibhau Dhavale is a PG student in the Computer Engineering, Bharati Vidyapeeth College of Engineering, University of Mumbai, Navi Mumbai, Maharashtra, India. She is an Assistant Teacher in the Department of I.T./C.S., ICLES' Motilal Jhunjhunwala College of Arts, Science and Commerce, University of Mumbai, Navi Mumbai, Maharashtra, India. Her research interests are Computer Networks and Data Mining.

Dr. M.Z.Shaikh is a Principal of Bharati Vidyapeeth College of Engineering, University of Mumbai, Maharashtra, India. He is a double Ph.D. holder, Ph.D (ECE), Ph.D (Mgt.).