

Automatic Question Paper Generator System

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Abstract: This is a challenging era due to the growth in the field of computer science and demand we are facing today. Hence examinations play a vital role in testing student's performance. And that is why it is important to have a smart development question model for growth of students as well as to test their learning skills thereby keeping a check on student performance. Now the traditional method of generating question paper has been manual. In this method certain officials chalk out the question paper. But this method can be ineffective at times owing to bias, repetition and security concerns. We have proposed an automated process of Question Paper Generation which is fast, streamlined, randomized and secure. Every task performed by this system is automated so that storage space, bias and security is not a concern anymore. Furthermore, we have proposed a new algorithm which ensures total randomization of questions and avoids repetitions. The proposed system can be helpful to many educational institutes and NGO based institutes.

Keywords: question paper generation; paperless; automation; randomization; information communication technology.

I. INTRODUCTION

In today's world, time is a major concern. Any product that can effectively reduce time and power consumption is accepted and appreciated.

Thus we are presenting an Automated Question Paper Generator System that can reduce time consumption by replacing the conventional method of question paper generation system.

It also needs lesser man power. We have implemented a role-based hierarchy which restricts access to the users. The system also deploys security mechanisms that prohibit duplication of question papers.

There are provisions to enter and edit data suitable to any educational organization with complete freedom for specifying courses, semesters, syllabus and pattern.

This enables an educational institute to generate question ensuring security and non-repetitiveness of question papers and is a boon for organizations with limited staff and resources. Our system aims to provide fast operations, data storage and high security for all its tasks.

The Question Paper Generator system automatically generates paper, prepares doc file as per selected paper format. Also emails it to other colleges.

After this question paper is converted to pdf file and emailed to colleges on button click.

A. Automation

Automation means to replace the manual operations with computer procedures and other machines. Automation is aimed at increasing productivity, manufacturing prowess.

It also reduces costs, labor and eliminates human error.

B. Types of Automation

Automation helps to increase productivity and reduces costs in industries. Automation plays a crucial role in manufacturing industries. Automation can be of different types: -

- a. Information technology (IT)
- b. Computer-aided manufacturing (CAM)
- c. Numerically controlled (NC) equipment
- d. Robots
- e. Flexible manufacturing systems (FMS)
- f. Computer integrated manufacturing (CIM)

C. Paper-based vs Paperless Systems

TABLE I
paper-based vs paperless systems

Paper-based System	Paperless System
Human process	Automated process
Low Security	Higher Security; Encryption
Patterns or repetitions may occur	Totally random and unbiased process
Slow as human labor involved	Faster due to computer based automation

II. LITERATURE SURVEY

A. Existing Paper-based Systems

The existing system for Question Paper Generation requires human staff to chalk out questions that appear in the question paper. These teachers or professors select the questions according to the syllabus and pattern as prescribed by the curriculum. The question paper then may be referred to a higher authority who has the final say in these matters.

B. Limitation of Paper-based Systems

As most human working processes, this system suffers due to bias. There might be some questions which are repeated in many question papers as the professor has a personal inclination towards them. So there is no guarantee of pure randomly generated question paper. Other problems that may plague this system are non-availability of staff and resources, natural calamities and accidents. Also, the security of the system can be easily compromised if leverage over the person responsible for generating question papers is obtained. Other limitations include: -

- a) Lack of storage space
 - a. Prone to damage
 - b. Inefficient document transportation
 - c. Supply costs
 - d. Poor environmental credentials
 - e. Limited collaboration
 - f. Editing problems

The paper on „Automatic Question Paper Generation System using Randomization Algorithm“ describes a system which uses a shuffling algorithm (existing algorithm) as a randomization technique. The system defines several modules such as user administration, subject selection, difficulty level specification, question entry, question management, paper generation, and paper management.

It supports multiple languages. Also, mathematical formulae and diagrams can be integrated in questions. The system has a dual interface viz., web-based and desktop-based. The system introduces a highly efficient shuffling algorithm which uses an array to store randomly generated numbers. The questions are then selected against these array elements, thereby ensuring completely random generated question papers. However, this system fails to utilize the highly efficient marking system. So, questions once selected may be repeated in subsequent papers. This is a limitation of this system.

The paper on „An Integrated Automated Paperless Academic Module for Education Institutes“ has stated the importance and working of switching from Paper based systems to Paperless Systems [2]. The importance of automation is very well documented in the context of Task Engineering [2]. The paper also clearly defines the importance of Information and Communication Technology (ICT) in academics and educational organizations [2]. The paper also describes many Access Control Methods such as MAC (Mandatory Access Control), DAC (Discretionary Access Control), RBAC (Role based Access Control) and DTE (Domain Type Enforcement) [2]. Role based Access Control is very helpful in automation due to the user hierarchy comprising of different roles [2].

C. Analysis

From above analysis we come to know that we need an integrated Question Paper Generation System with improvements in terms of speed, efficiency, controlled access to the resources, randomization of questions and security.

The system should perform tasks in the fastest way without violating the role-based hierarchy and their access rights policy, provide a central database for data storage, ensure security and optimize the overall performance of the System.

III. PROPOSED SYSTEM

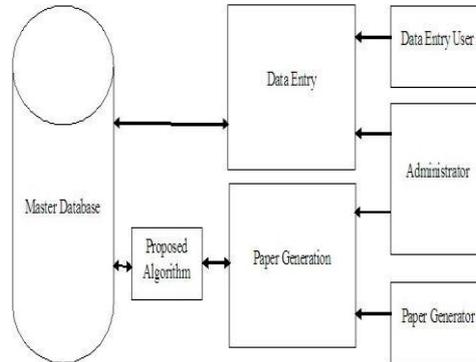


Fig. 1 Architecture of Automated Question Paper Generation System

To generate the question paper we can divide the proposed system into phases such as:

1. Selection of Parameters.
2. Question Bank Formation.
3. Final Question Paper Generation.

Working of the system:

1. Admin makes the skeleton of the question paper which consists of various questions and sub-questions.
2. Faculties are made to enter questions into the database along with their respective difficulty level and priorities.
3. This question bank is then sent for paper generation. Question paper is prepared on the basis of the difficulty level set by the admin. Question chosen will be unbiased and based on the algorithm.
4. This question paper is then analyzed by the admin.
5. After analysis, the generated question paper can be mailed to different colleges by the university.

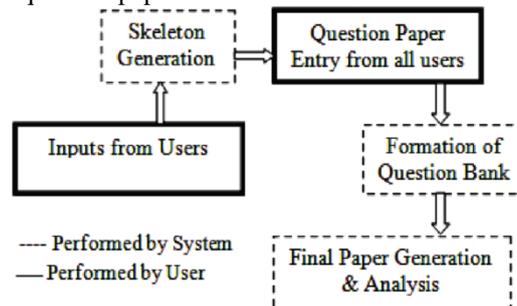


Fig. 2 Architecture of Automated Question Paper Generation System

IV. IMPLEMENTATION

The Automated Question Paper Generation System is implemented in C#. The fully working system stores courses, questions and patterns of question papers. It then applies the algorithm on the stored question set and prints the question paper in pdf format.

A. Presumptions of the System

The Question Paper Generator system has been developed considering the following presumptions: -

- a. All courses provide a well-defined course content which would be taught or left for self-study.
- b. Each course has its specific code.
- c. All questions belonging to a particular course lie in some question type/category.
- d. The institute can have any number of courses and streams.

B. Proposed Algorithm

For N questions available in database

- Step 1: Create a List „L“ of N elements
- Step 2: Generate a random number „n“ such that $1 \leq n < N$
- Step 3: If $n \in L$
Go to Step 2
else Store n in the List L
- Step 4: Select a question from database corresponding to n, whose
flag==true
- Step 5: For the question, set flag=false

C. Application

The revised Automatic Question Paper Generation System is accessible on personal computer and laptop.

D. Features and Benefits Of System

Following are some of the features of the Question Paper Generation System: -

- a. Simple interface which enhances the ease of updating data.
- b. Generates and prepares the Question Paper in a matter of seconds
- c. Question Type can be Knowledge-based, Logic-based, Memory-based and Application-based.
- d. Questions can be easily edited.

The Automated Question Paper Generation System provides various advantages to the user when compared to the traditional system. Listed below are some of the advantages of the system: -

- a. User can generate test papers randomly and instantly, thus saving a lot of time.
- b. The algorithm enables randomization of questions.
- c. A new question can be added to the database at any instance and different sets of test papers could be generated without any limitation.

V. CONCLUSION

In this paper, an automated Question Paper Generator is proposed which is implemented as a real-time application in Barshi, Solapur. The proposed work describes an automated system that progresses from the traditional method of paper generation to an automated process, by providing controlled access to the resources. We have also considered the importance of randomization in the task of paper generation. Our system has deployed an efficient algorithm which is totally randomized and avoids repetition of questions in consequent question papers, making it impossible to derive any pattern in the papers. We distinguish between administrators and subordinates by their tasks. Therefore, the resultant automated system for Question Paper Generation provides improvement in terms of controlled access to the resources, random generation of question papers and a secure platform.

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