

Question Bank Based Paper Setting

An Automatic Question Paper Generation System

Meetali Dulera
Student
Computer Department
VESIT

Kunal Chugriya
Student
Computer Department
VESIT

Vrudhi Israni
Student
Computer Department
VESIT

Rahul Tejwani
Student
Computer Department
VESIT

Prashant Kanade
Assnt. Professor:
Computer Department
VESIT

Abstract:- In this paper there is a proposal for a question bank based paper setting system. In the proposed model the major stakeholders are members of the examination control unit, Paper setters, chief moderator who will act as administrator. Faculty members are paper setters who will provide the set of questions to the admins who will insert them into the database. The questions are stored in a database along with their weightage, topic, subject and difficulty level. Whenever there is a need to set the paper, the system selects questions randomly in a way that their weight age makes up for 100 marks . The paper setter has an option to select how many difficult questions and how many easy questions should be present in the generated paper. Paper setting process is very flexible. Generated paper is converted to a pdf file and emailed to colleges on button click.

Keywords:- Optical Character Recognition; Educational Technology; Product Development; Graphical User Interface.

I. INTRODUCTION

Traditionally, exam writing has been done manually using the knowledge, experience, and style of the reputed teachers of institutions. Despite the high recognition of the questions, there are still some shortcomings. The main problem is the low quality of the exam papers caused by some human factors like fatigue and a relatively narrow range of topics. Teachers spend a lot of time and energy while creating exam papers. A way to automate this tedious process is the need of the day. Therefore, automatic exam question paper generation is an important topic to be worked upon.

In today's world, time is a major concern. Any product that can effectively reduce time and power consumption is accepted and valued. Therefore, we are introducing a question bank based paper setting system, which reduces time consumption by replacing the conventional method of the system for producing question paper. It also requires less manpower. We have implemented a role-based hierarchy that restricts access to users. The system also uses security mechanisms that prevent questionnaires from being

duplicated and circulated before the examination takes place. There are provisions for entering and manipulating data that are appropriate for any educational institution and that have the ability to add courses, semesters, subjects etc. This enables an educational institution to generate questions that ensure the safety and non-repetition of questionnaires and is a boon for organizations with limited staff and resources.

Our system aims to provide fast processes, data storage and a high level of security for all of the tasks. The Question Paper Generator system will automatically generate the paper and prepare the document file according to the selected subject, marks and difficulty. To ensure safety, before the question paper is made visible, the user is asked to re-enter its password in order to confirm their identity. The generated question paper will be converted to a PDF file and will be emailed to the universities by clicking the button.

II. RELEVANCE

Covid-19 has urged various sectors to go digital. It is a digital era where tasks are going digital as much as possible. Hence, there is a need for an online, digital way for setting Question papers. The predominant methodology is that a specific number of faculties are handed over a syllabus and assigned the task of framing a question paper out of it. Out of all the papers created, one is chosen at random and used for the examination. This method is stated as a Classical Method.

This system suffers from the subsequent disadvantages: dependency on intelligence of one person may raise the chance of errors, important parts of the syllabus may go unnoticed, secrecy may get compromised and full utilization of resources might not be possible, thus making it inefficient. Consistent with the need, an autonomous system for question paper generation has been proposed. Creating a question paper through our system makes it a lot more efficient, reliable, improves its quality, and also cuts back the time taken by instructors in setting the question papers manually.

III. PROPOSED SYSTEM

Our proposed model is special and unique software, which will provide ease of entering questions and making the question generation process extremely efficient. Two of the main features of our system are an OCR (optical

character recognition) based question insertion procedure, which allows the users to enter multiple questions together. The second feature is the flexibility of adjusting the number of easy and difficult sub-questions within every question. This results in the generation of strong and balanced question papers.

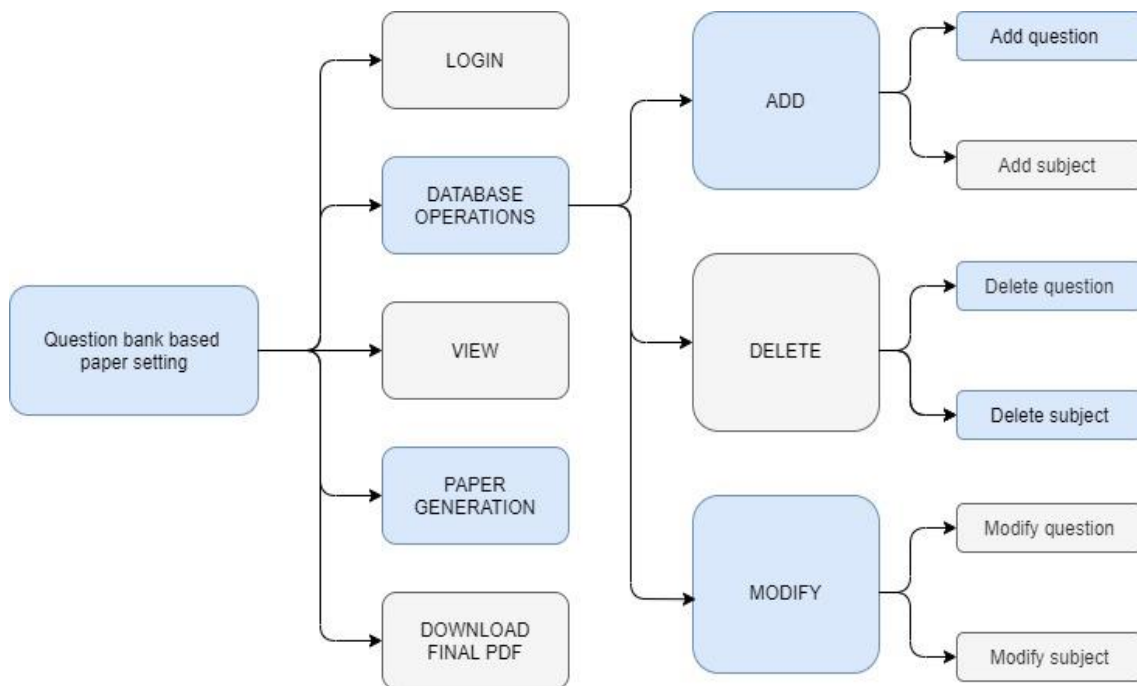


Fig. 1. Block diagram of proposed system

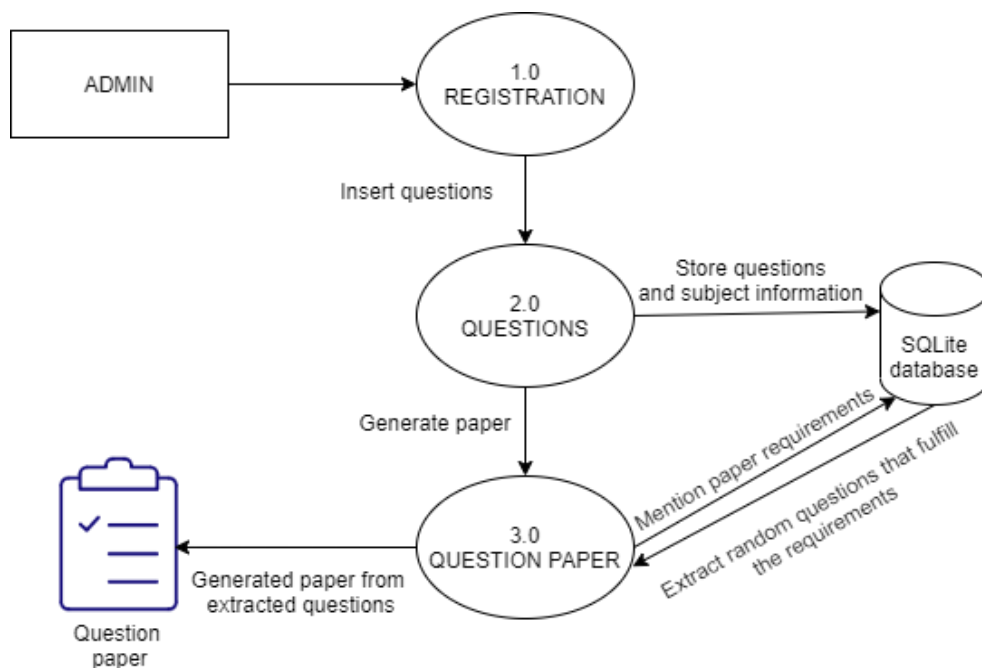


Fig. 2. Data Flow Diagram of proposed system

IV. FUNCTIONAL REQUIREMENTS

A. Login

The login module will be restricted to very few trusted people only. It will be password protected and nobody else should be given access to the system in order to maintain security and prevent frauds.

B. Question insertion

The user can insert questions into the database by either entering one question at a time or by uploading a pdf filled with questions. In this way, the user can collect pdfs from different teachers and maintain the security by reducing the number of users for the system.

C. Filling up required fields

The inserted questions will have the following fields associated with them: Semester, Subject, Marks, Difficulty and Topic.

D. Generation

The user has to fill a form which gives an option to choose the number of difficult and the number of easy sub questions for every question. It also gives an option to choose the number of 5 mark sub questions and 10 mark questions within every question. Finally, the admin has to select the subject name and then click on the generate button. Now the database is triggered and the system extracts random questions from the database that fulfill the given criteria.

E. Confirmation

Before being able to view the question paper, the user is asked to re-enter its password to prove that the person requesting the paper can be trusted or not. This adds an additional security measure into our system.

V. METHODS AND PROCEDURES

The steps followed for the execution of the system were as follows

- Creating a database in SQLite to store questions
- Creating a form to enter questions into the database
- Creating an option for inserting questions into the database through a PDF format.
- Creating a “Generate paper” form.
- Converting the generated paper into PDF and downloading it.
- Creating appropriate front end and backend and integrating it using flask

The algorithms implemented were as follows

- OPTICAL CHARACTER RECOGNITION (OCR) is the use of technology to distinguish printed or handwritten text characters inside digital images of physical documents, such as a scanned paper document. The basic process of OCR involves examining the text of a document and translating the characters into code that can be used for data processing. OCR is sometimes also referred to as text recognition.

How did we use OCR in our system?

We used optical character recognition for recognizing

questions from the uploaded PDF documents.

When the user uploads a PDF document that has been made in a predetermined format, our system recognizes the questions, their marks and their difficulty status.

The system displays all the extracted questions to the user for a verification before inserting them into the database.

This technology makes the question insertion process extremely easy.

- The SQL SELECT RANDOM() function returns a random row from the database. It is often used in online exams to display the random questions without repetition or duplication.

How did we use it in our system?

We used the RAND() function to extract random questions from the database and create the question paper.

Once the user has entered its required number of questions, marks and difficulty levels, this RAND() function acts on it to select random questions that fulfill the criterias.

It helps in prevention repetition or duplicacy of questions.

VI. RESULTS

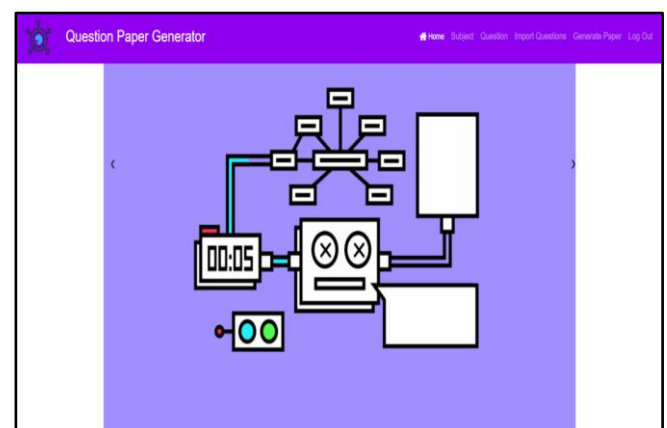


Fig. 3. Dashboard of proposed system

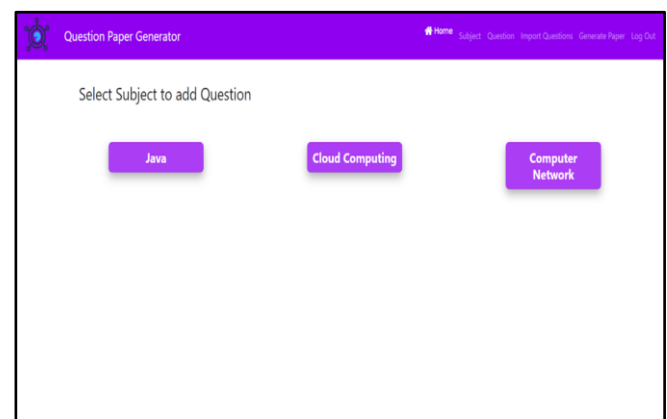


Fig. 4. List of available subjects

VII. FUTURE SCOPE

In future, more features can be included to generate question paper for online and offline MCQ examinations. This eliminates the problem of paper leak cases in the prestigious examinations. Thus, making the examination process more effective and secure. We can work on improving security features of the system to make it as secure as possible. We can also use natural language processing to create questions from the entered paragraph automatically. Question insertion tasks can be made more easier and user friendly. We can collaborate with an exam department team to discuss the minute security details which can be added. Work can be done in making the system more accessible and reliable for the institutions to use. There can be a feature of adding a portal for students to generate sample question papers and practicing for the examination. Making provisions for collaboration of different colleges to get a more diverse and rich set of questions. Adding algorithms that automatically detect duplicate questions from the system and deleting it. Adding an answers section for each entered question. While generating a question paper, a sample answer key will also be generated for the teachers.

VIII. CONCLUSION

We have created a question bank based paper setting system which provides a wide portion coverage and strong, efficient question paper generation. Paper leak chances are reduced. Transportation of papers from one college to another is no longer required. The system provides an unbiased result. Time consumption and human efforts are reduced significantly by using our system. We have created a user-friendly web based application with some unique features like uploading a file filled with questions for inserting multiple questions together; and flexibility of adjusting the marks and difficulty of questions. This system can be used in various institutes and colleges for the purpose of question paper generation.

ACKNOWLEDGMENT

We express our deepest sense of gratitude towards our respected and noble guide Mr. Prashant Kanade for spending his valuable time on several occasions to impart us the gains of his knowledge. It was our privilege to have work under his guidance. We shall always remain indebted to him. His guidance helped us in all the time of research and writing of this paper. We could not have imagined having a better advisor and mentor for my Final year project. We express our gratitude for his encouragement, insightful comments, and hard questions. We would also like to thank our college Vivekanand education society's institute of technology, and all its teachers of the computer department for giving us great opportunities of working on amazing projects.

REFERENCES

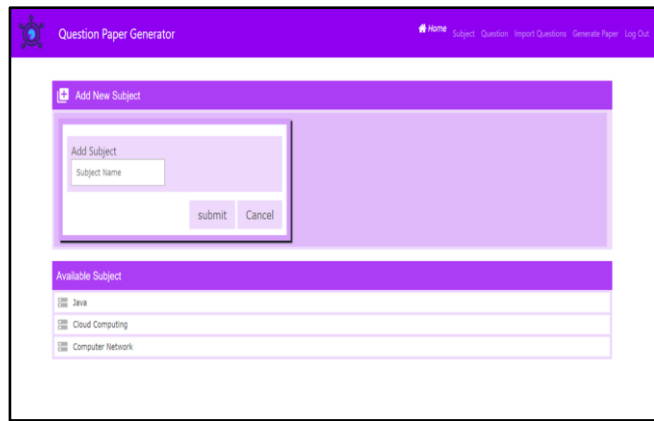


Fig. 5. Form to insert a new subject

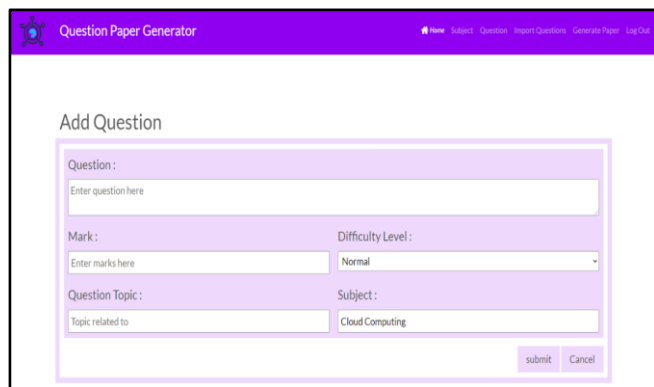


Fig. 6. Form to enter a new question

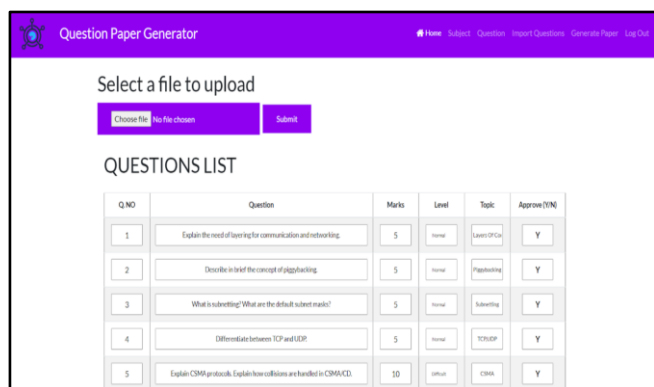


Fig. 7. Multiple questions entered together by uploading a PDF filled with questions

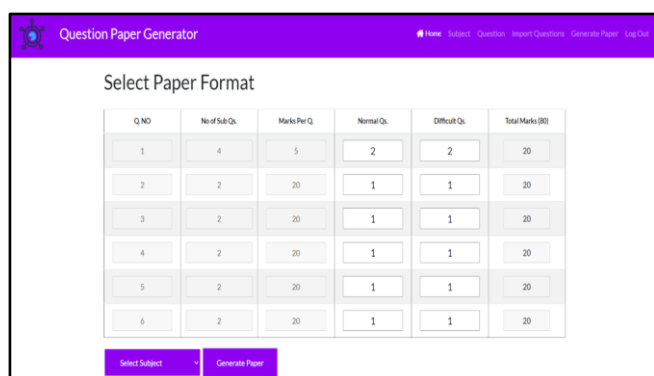


Fig. 8. Form for generating question paper

- [1]. Janpla, Satién & Wanapiron, P.. (2018). System framework for an intelligent question bank and examination system. *International Journal of Machine Learning and Computing*. 8. 488-494. 10.18178/ijmlc.2018.8.5.734.
- [2]. Kurdi, G., Leo, J., Parsia, B. et al. A Systematic Review of Automatic Question Generation for Educational Purposes. *Int J Artif Intell Educ* 30, 121–204 (2020). <https://doi.org/10.1007/s40593-019-00186-y>
- [3]. Zolait, Ali & El-Rahman, Sahar. (2018). Automated Test Paper Generation Using Utility Based Agent and Shuffling Algorithm. *International Journal of Web-Based Learning and Teaching Technologies*. 14. 10.4018/IJWLTT.2019010105.
- [4]. Rawat, Mrs Asha, Priyesh Solanki, Manish Patil, Shraddha Mhetre, and Urvashi Bhadarka. "QUESTION PAPER GENERATOR SYSTEM."
- [5]. Naik, K., Sule, S., Jadhav, S. and Pandey, S., 2014. Automatic Question paper Generation System using randomization algorithm. *International Journal of Engineering and Technical Research (IJETR)*, 2(12), pp.192-194.
- [6]. Naik, K., Sule, S., Jadhav, S. and Pandey, S., 2014. Automatic Question paper Generation System using randomization algorithm. *International Journal of Engineering and Technical Research (IJETR)*, 2(12), pp.192-194.
- [7]. Ramli, R., Sivan, S. and Razalli, H., 2020, February. A Review on Automated Examination Question Paper Template Generator. In *2020 16th IEEE International Colloquium on Signal Processing & Its Applications (CSPA)* (pp. 180-185). IEEE.
- [8]. [12] Vijayalakshmi B.T, Bhavya B M "Automatic Question Paper Generation System" *International Journal of Scientific Research in Computer Science, Engineering and Information Technology* 2017 IJSRCSEIT | Volume 2 | Issue 3 | ISSN : 2456-3307
- [9]. Choudhary, S., Waheed, A.R.A., Gawandi, S. and Joshi, K., 2015. Question paper generator system. *Int. J. Comput. Sci. Trends Technol.(IJCST)*, 3(5), pp.1-3.
- [10]. Aleena Susan Mathew, Vidya. N "Implementation of Automatic Question Paper Generator System" *International Research Journal of Engineering and Technology (IRJET)* Volume: 06 Issue: 02 | Feb 2019
- [11]. Umardand, A. and Gaikwad, A., 2017. A Survey on Automatic Question Paper Generation System. *International Advanced Research Journal in Science, Engineering and Technology (IARJSET)*, pp.18-20.
- [12]. Hegde, V., Rao, L.V. and Shivali, B.S., 2018. The Framework for Web-Based Automated Online Question Paper Generator through JEE. *International Journal of Engineering & Technology*, 7(3), pp.1415-1419.
- [13]. Zalte, S. V, Jadhav, C. C., Mangier, A. A., Hole, A. D., & Tulshi, A. R. (2018). "Automatic Question Paper Generator System". *Cim*, pp[545–548]. <https://doi.org/10.17148/IJARCCCE.2018.73103>
- [14]. Dhawaleswar Rao Ch and Suján Kumar Saha, "Automatic Multiple Choice Question Generation from Text: A Survey", IEEE, 2018.
- [15]. Liancheng guan, "The design of the automatic generative system of examination papers", IEEE, pp[110-113], 2017.
- [16]. Gauri Nalawade, Rekha Ramesh" Automatic Generation of Question Paper from User Entered Specifications using a Semantically Tagged Question Repository" IEEE 8th International Conference on Technology for Education, 2016.
- [17]. Jun Araki, Dheeraj Rajagopal, Sreecharan Sankaranarayanan, Susan Holm, Yukari Yamakawa, Teruko Mitamura "Generating Questions and Multiple-Choice Answers using Semantic Analysis of Texts" International Conference on Computational Linguistics: Technical Papers, pages 1125–1136, Osaka, Japan, December 11-17 2016.
- [18]. Dhawaleswar Rao Ch and Suján Kumar Saha, "Automatic Multiple Choice Question Generation from Text: A Survey", IEEE, 2018.
- [19]. Liancheng guan, "The design of the automatic generative system of examination papers", IEEE, pp[110-113], 2017.
- [20]. Gauri Nalawade, Rekha Ramesh" Automatic Generation of Question Paper from User Entered Specifications using a Semantically Tagged Question Repository" IEEE 8th International Conference on Technology for Education, 2016.
- [21]. Jun Araki, Dheeraj Rajagopal, Sreecharan Sankaranarayanan, Susan Holm, Yukari Yamakawa, Teruko Mitamura "Generating Questions and Multiple-Choice Answers using Semantic Analysis of Texts" International Conference on Computational Linguistics: Technical Papers, pages 1125–1136, Osaka, Japan, December 11-17 2016.