

Automatic Question Paper Generator Using Artificial Intelligence

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Abstract: This process involves using Natural Language Processing (NLP) techniques, specifically LSTM (Long Short-Term Memory) algorithms, to generate questions from text while ensuring semantic accuracy and syntactic coherence. Unlike tasks such as summarization and paraphrasing, generating questions requires not only understanding the text but also being able to frame questions that elicit specific information, thus necessitating answers. To overcome this challenge, the approach involves several steps. First, the text undergoes preprocessing with NLP techniques to remove irrelevant or redundant information, as well as to identify and extract keywords crucial for generating questions. Next, LSTM algorithms are employed to process the text and keywords, enabling the system to understand the context and semantic nuances present in the text. Once the text has been processed, the system begins constructing questions. Instead of directly asking questions based on the extracted keywords, the LSTM algorithm twists or rephrases the questions to ensure they are not merely repetitions of the original text. This twisting process involves rearranging sentence structures, altering word choices, or introducing subtle variations to produce questions that are natural-sounding and coherent

while still effectively eliciting the desired information. By leveraging NLP techniques and LSTM algorithms in this manner, the system can generate questions that are not only semantically accurate and syntactically cohesive but also effectively engage with the content of the text, overcoming the challenge of needing answers to frame meaningful questions. This approach represents an innovative use of NLP technology to enhance question generation capabilities, enabling more robust and contextually relevant questioning from textual data.

1. INTRODUCTION

1.1 Artificial Intelligence

Artificial Intelligence (AI) is a dynamic field within computer science dedicated to developing systems that can perform tasks traditionally associated with human intelligence. AI systems are broadly categorized into Weak AI, designed for specific tasks like virtual personal assistants and image recognition, and Strong AI, aspiring to possess general intelligence akin to human cognitive abilities. Machine Learning (ML), a subset of AI, empowers algorithms to learn from data, allowing systems to recognize patterns and make decisions without explicit programming. Deep Learning, a specialized form of ML utilizing neural

networks, has proven especially effective in tasks like image and speech recognition. Natural Language Processing (NLP) enables computers to comprehend and generate human language, fostering applications such as chatbots and language translation. Computer Vision enables machines to interpret visual data, while Robotics integrates AI to facilitate autonomous decision-making in robots. AI applications span diverse sectors like healthcare, finance, and education, continually evolving and prompting ethical considerations. As technology progresses, the distinction between Weak and Strong AI blurs, marking AI's transformative impact on society.

1.2 AI for Question Paper Generation

The automated question paper generation system presented in this paper offers a comprehensive solution for educational institutes, streamlining the process of creating question papers while ensuring adherence to curriculum requirements and syllabi. By implementing a role-based hierarchy, the system effectively manages user access, safeguarding against question repetition and ensuring data security. Teachers, who typically spend a significant amount of time on question paper generation, benefit from the system's ability to quickly generate papers based on specified syllabi, semesters, courses, and patterns. This system addresses the challenges faced by educational institutions with limited resources, providing a robust platform for efficient, secure, and non-repetitive question paper generation.

II.LITERATURE SURVEY

Rohan Bhirangi[1] implemented as a real-time application in Samnx Pvt. Ltd., Belapur, Navi Mumbai. 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. This is achieved by comprehending users and their roles in the institute. 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.

Fenil kiran Gangar[2] implemented system tries to address the above mentioned issues in an efficient way. The implemented work narrates an automated system that heads away from the traditional process of paper generation to an automated process, by giving controlled entry to the resources that is attained by involving users and their roles in the colleges. We have also considered the significance of randomization in the process of paper generation. Our system has used a logical algorithm which is absolutely randomized in nature and avoids duplication of questions. Hence the resultant automated system for Question Paper Generation will yield enhancement in phrase of controlled access to the resources, random creation of question papers and a secure platform.

Shunham Aaghade's[3] main purpose of this software is to generate a questionnaire using a randomization algorithm. This is a desktop-based

software that produces a unique set of question papers based on a constraints table which leads to precise output with minimum probability of errors. The system is completely unbiased and takes advantage of randomization while generating the question paper. The user is just a few clicks away from generating an exemplary question paper. Hence the AUTOMATIC QUESTION PAPER GENERATOR is a much more secure and optimized system.

Parth Shah's research paper[4], an automated design model for Question Paper Generation has been proposed which is implemented as a real time application. The proposed work explains an automated system that shows progression from the traditional method of paper generation to an automated process, by providing controlled access to their resources. This can be achieved by comprehension of users and their particular roles in the institute. We have considered the importance of randomization in the task of paper generation and has deployed an efficient algorithm

that is completely randomized and also restricts repetition of questions in question papers. We can differentiate between administrators and subordinates by their respective tasks. Hence, the resultant automated system model for Question Paper Generation provides progression in terms of controlled access to the resources and fully secure.

Mohit Tulsani implemented system provides an easy-to-access user interface to the subject handlers wherein they can efficiently manage their respective question repositories for every subject. Our system also addresses the issue of duplicate entries in the question repository, that is, if two same questions have been selected, then it removes the duplicate value before placing it into the question paper. The generation of question paper is quick and automated and downloadable with the click of a button. Hence, it provides the flexibility which is lacking in the current system[5].

<i>SNO</i>	<i>TITLE</i>	<i>AUTHOR</i>	<i>PROS</i>	<i>CONS</i>
1.	Automated Question Paper Generation System	Rohan Bhirangi, Smita Bhoir	Can generate Question Papers randomly and instantly	Inefficient document transportation
2.	Automatic Question Paper Generator System	Fenil kiran Gangar, Hital Gopal Gori	Generates and develops the well formatted question.	Restricted Collaboration and modification problems.
3.	Automatic Question Paper Generator.	Shunham Aaghade, Manan Parikh	It has better portability when more questions added.	Lack of Security.
4.	An Intelligent Question Paper Generator using Randomized Algorithm	Parth Shah, Uzair Faquih.	View question paper logs from master database	Limited Collaborations and editing problems
5.	An Expert Automated Question Paper Generation.	Karthikayani K, Mohit Tulsani	Can adapt to different levels and challenging questions.	Time consuming is more.

Fig 1. Literature Survey

III.EXISTING SYSTEM

In the existing system for question paper generation, the Keyword-based Shuffling Algorithm is employed to shuffle questions while maintaining specific keywords or criteria. This algorithm ensures that key topics or concepts, identified by the keywords, are appropriately distributed throughout the question paper. By prioritizing these keywords during shuffling, the algorithm helps create well-balanced and comprehensive question papers that cover the essential content areas specified by the curriculum or syllabus. This approach enhances the effectiveness of the question paper generation process, ensuring that important topics are adequately represented while still providing a degree of randomness and variety in the final output.

DISADVANTAGES OF THE EXISTING SYSTEM

One disadvantage of the Keyword-based Shuffling Algorithm is that it may result in predictable patterns if the keywords are overly prioritized, potentially diminishing the randomness and variety desired in the shuffled output.

IV.PROPOSED SYSTEM

The proposed system for question generation harnesses Natural Language Processing (NLP) techniques, specifically LSTM algorithms, to extract semantic meaning and syntactic structure from textual input. Through a series of preprocessing steps, including the removal of irrelevant information and identification of key keywords, the system prepares

the text for question construction. The LSTM algorithm then dynamically rephrases and twists extracted keywords to generate diverse and contextually relevant questions, ensuring they are not mere repetitions of the original text. This innovative approach not only guarantees semantic accuracy and syntactic coherence but also engages with the text's content effectively. By leveraging NLP technology, the system addresses the challenge of framing meaningful questions without prior answers, offering a sophisticated solution for automated question generation from textual data.

ADVANTAGES OF THE PROPOSED SYSTEM

One advantage of the proposed system is its ability to dynamically generate diverse and contextually relevant questions by leveraging Natural Language Processing (NLP) techniques and LSTM algorithms. By extracting semantic meaning and syntactic structure from textual input and intelligently rephrasing extracted keywords, the system ensures the creation of questions that are both engaging and non-repetitive. This approach not only guarantees semantic accuracy and syntactic coherence but also effectively addresses the challenge of generating meaningful questions without prior answers, offering a sophisticated and efficient solution for automated question generation from textual data.

V.CONCLUSION

This project develops a Natural Language Processing (NLP) system that generates natural language questions from text while ensuring semantic accuracy, syntactic coherence, and relevance. This involves employing techniques such as keyword extraction,

LSTM processing, and question twisting to create questions that effectively engage with the content and elicit specific information, addressing the challenge of generating meaningful questions without prior answers.

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