

E-Examination System

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Abstract: Examination is most vital part for determining performance standard of a student. Every subject has set of aims and objectives & examination system is used to evaluate whether students have achieved those objectives. For generating a question paper more than one experienced teachers are supposed to contribute with their sets of question paper. For grading students, the answer sheets filled by them are evaluated personally by teachers which is a time taking process. Hence it's a need to have a system which automatically generates the question paper from specification which teacher has entered within few seconds. Researchers recommend different sets of tags such as difficulty level, type of question, content / modules for defining a question etc. The proposed system will automatically generate a question paper from question database. The purpose of online examination is to automate the traditional examination system and save the time for papers checking. The prime goal of online examination is to efficiently assess the student with the help of an automated system that doesn't only save the time but also provide the results rapidly.

Keywords: online-examination, rigid

1. Introduction

E-Examination system converts the traditional examination system into a more accurate and faster system. In traditional examination system, multiple experienced teachers give their inputs to form a question paper. After which one of the created question paper is selected for the respective subject's exam. Then the answer sheets filled by the students are sent to the respective subject teachers, of various institutes affiliated by the University for Evaluation. This data is then collected and the result is generated by university. There is also provision for reevaluation of answer sheets if students request for the same. This system is time consuming and there are flaws in the system such as at times the answer sheets are misplaced, mistake in the question paper, time taking reevaluation process. This entire examination system is a vital component for assessing student's performance.

The current paper presents a system which automates the complete examination system. Each task in the system is automated like generation of question paper, regenerating question and question bank. The system is time saving, requires less manpower. The question paper is generated using the questions stored by teachers in the database. While storing the questions, they should be stored module wise and the difficulty level should also be defined. Even the model answer with diagram (where ever required) should be stored. The database

is saved in an encrypted format using AES Encryption algorithm which makes the system secure. Our system provides an interface through which the students can appear for examination on the day of exam of the respective subject. They can upload the diagrams supporting answers using the button provided to upload image. The link will be active only for the predefined exam time. After which the exam would end automatically.

After submission of exam the system also evaluates the answers and grades them. The system is designed to check MCQs, Subjective answers and diagrams. The system compares the answers typed by student with the model answers and grades them accordingly. While generating the result the system counts marks of question no one compulsorily and then from the remaining five questions counts the marks of three questions having the highest marks.

In the current scenario, if the student applies for re-evaluation (in case of failure or in thrust of more marks) in Mumbai University He/she has to apply for it through college. The college sends request for the same to the University. Then the checked answer sheet is photocopied and passed to the respective subject teacher for re-evaluation. After re-evaluation the updated result is displayed to the student which is time consuming process. In our system the students can apply for re-evaluation through their logins in the specified time period. Then re-evaluation is done by respective subject teacher through their logins and result is displayed on student login.

2. Related work

Previous work has been referred which proposes a lot of challenges related to the manual examination system and the problems caused due to them.

In the year 2015, The Research and Design of Online Examination System [1], this paper proposed the roles of teachers and Examinee in the examination system through this paper. This paper helped us to decide the activities performed by different modules of our system. In 2018, Android Based Exam Paper Generator [2]. This paper proposes an automatic paper generation system. We got an idea regarding the factors to be considered while generating a question paper. As advancement to this existing system we are not only generating the question paper but also evaluating the answers.

In 2018, Encryption and Decryption using Password Based Encryption, MD5, and DES [3]. This paper describes

implementation of MD and DES algorithm for Securing Data. But we found out after studying this paper and some more material that AES algorithm will best suit for securing our system.

In 2017, Question Paper Generator and Answer Verifier [4]. This paper Proposes a system for Paper generation as well as answer verification. We got to know about the technology which can be used for checking subjective answers through this paper. As advancement to this we propose a system that not only checks MCQs and subjective answers but also checks diagrams and re-evaluation of answers can also be done.

3. Aim & Objectives

1) Aim

The prime goal of E examination is to automate the complete examination system right from question paper generation to answer evaluation & result generation.

2) Objectives

The following are some more objectives of E-Examination System:

- To ease the ask of collection of questions and generating a question paper which will cover all the chapters and will have a predefined difficulty level
- To ease the rigorous task of maintaining and assessing the answer sheets.
- To make the process of re-evaluation easier and less time taking.
- To create a secure E-Examination system.

4. Problem statement

With the development of society, different kinds of examination appear constantly. The way of traditional examination has been not able to meet the needs of the developing education information. [5] Online examination system is required to eliminate the need of manual answer evaluation. This system separates each task which is performed according to pre-written methodology in fully automated way. It reduces the time killing process of examination. Online examination system is going to be used by every institution in the near future due to its flexibility and facilities offered by the system.

A. Proposed System

In this paper we present an E-Examination system for various universities. This system allows universities to generate question papers with random questions to cover required chapters of a subject with difficulty level within seconds and mail them to colleges on scheduled time. In our system we allow administrator to input a set of questions and respective answers for evaluation. We also allow admin to provide weight age and complexity for each of these questions. After this the questions are stored in database along with their weight age and difficulty level. While question paper generating time, the admin has to select the difficulty level and weight age of the

paper and sub questions. On this selection, the system selects questions randomly in a way that the paper is set according to difficulty level (Easy, Medium, Hard) and weight age that admin chooses. According to complexity level the questions are chosen. After these selections the system automatically generates paper which is then sent to the institute Module in an Encrypted form.

Our System is also an automatic answer checker application that checks, and marks written answers similar to a human being. This software application is built to check MCQs, subjective answers and diagrams in an examination and allocate marks to the user after verifying the answer accordingly. The system requires you to store the original answers and diagrams for the system. This facility is provided to the teachers. The teachers may insert questions and respective subjective answers in the system. These answers and diagrams are stored in the database. When a user takes the test, he is provided with questions along with the space, where he can type his answers. Once the user enters his/her answers the system then compares this answer with the original answer which is written in database and allocates marks accordingly. The system even checks the diagrams and allocates marks for the same.

5. Scope

Scope of this project is very broad compared to other exams which are taken manually.

Few of them are: -

- This can be used in educational institutions as well as in corporate world
- Can be used anywhere any time as it is a web-based application (Location doesn't matter)
- This system also evaluates the student's capability and skills efficiently.
- It is fully automated system which provides unbiased and fast results.
- In this system there is no need of transporting paper through police/security vans to all colleges.
- The usage of this system reduces human effort and resources to an extent

6. Methodology

A. University Module

It consists of 2 logins:

- *Admin login:* Admin has rights to add teacher account & institute account with the details provided to the admin. The created teacher and institute will receive an email on their registered email ID, regarding the Login Id and password of the created account. Admin has rights to generate question paper and question bank. Admin sends the question paper and encryption key to the institute
- *Teacher Login:* It would consist of a login page where teachers can enter their login ID and password given

to them via email. These credentials will be checked in the database maintained by our system. If the credentials match the teacher will get access to the system. Our system would accept questions in text format. Teacher can add subject & questions with the standard answers for the question module wise. To add up to the question database teacher needs to specify the module for which the questions need to be entered. Teacher can also upload diagrams wherever necessary. Teacher can enter mcq question, long question and short questions. Teacher needs to look after various parameters while entering questions like selecting marks for each question from a dropdown and difficulty level as input from teachers. This detail will be moved to the database & stored in encrypted format.

B. Institute Module

This module will receive question paper 20 minutes before the time of exam which would be password protected. Authorized person would decrypt the same by entering password received on registered email id 5 minutes before the commencement of exam. They the institute needs to forward it to the student module at the time of exam conduction

C. Student Module

Students will receive a question bank before examination on their respective login. At the time of exam, the link to attempt exam will be activated at the student login. The student can attempt exam within the given time slot. Student can type the answer in text form and can upload diagrams wherever necessary. This will be again stored in Database. The calculated results will be displayed on student's login. Students can also apply for re-evaluation if required.

D. Encryption

The questions and the answers entered by the teacher will be moved to the database in an encrypted format. This encryption is performed by the E-Examination system. For encryption the system uses AES Encryption technique. The AES encryption algorithm describes a number of transformations to be performed on data which is stored in an array. In this type of encryption, the firstly the cipher puts the data into an array; after which the cipher transformations are repeated several time of encryption rounds. The number of rounds in this type of encryption is given by the key length, where 128-bit key takes 10 rounds, 192-bit key takes 12 rounds and 256-bit key takes 14 rounds [6].

E. Question paper generation

Admin will have rights to generate question paper. In the tab provided at admin login, admin will specify year, branch & subject for which paper has to be set. Admin has to enter parameters like total marks of paper, duration of the exam, start time and date of the examination. Admin needs to enter the encryption key to protect the paper for leaking. There is a

predefined UI for entering the number of sub questions with required marks and the modules from which the questions need to be picked up. The system will search for the questions in the database which matches the given parameters by the admin. The matches will be randomized and a question paper will be generated according to admin's given parameter.

F. Answer evaluation

The system provides the provision of entering answer in 3 formats-mcq, long answer & short answers along with diagrams.

- **MCQ answer Evaluation:** The answers entered by students will be checked by comparing with the answers stored in database.
- **Long And short answers:** These answers will be evaluated using Stop word Removal & Tokenization. Stop word removal removes all the prepositions of the entered answer & Tokenization maps the keywords of both the stored answer & the entered answer & checks the number of matches.
- **Diagram Evaluation:** Students can draw diagram on a sheet of paper and scan it using a scanner or use any application like paint to draw image acceptable by the university. Students can upload diagrams in any image format. Diagrams will be converted into binary equivalent and stored in blob format in database. Diagrams will be compared byte by byte with the stored diagrams.

G. Result generation

According to the evaluation done by the Answer Evaluation module the answer sheet of the students will be graded. These marks will be sent to the student login when the admin will send it to them at the time of results announcement. The result will also be sent to institutes.

H. Re-evaluation

After display of result if the students are not satisfied with the marks obtained they can request for re-evaluation. Teacher will get a prompt after receiving the re-evaluation request. Teacher has to check this paper manually and re grade the student accordingly.

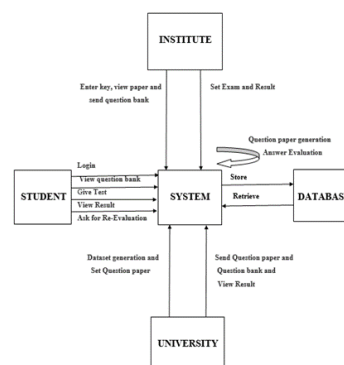


Fig. 1. Architecture of system

7. Conclusion

The E-Examination system is based on Web, which realizes various login for Admin, Teacher and Student. Question paper is generated by the system, the examinee takes online examination, automatic Answer Evaluation and Result displayed Online. The Encryption of Question paper in proposed system increases the safety of the system. What more, the additional features include uploading images for diagrams in answer and other related operation. The system is relatively simple to operate, and has a good interface.

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