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Automatic Evaluation of Multiple Choice Questions with the Relaying the Result using GSM Network.

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ABSTRACT

Now-a-days there are various types of examination or tests that are conducted to determine performance of a student. A major percentage of these tests are conducted in an Multiple Choice Question format, this format is highly popular as it judges the knowledge of a candidate with speed and accuracy. But the dependency on buying exclusive machines(OMR) for evaluation of these examinations has also increased greatly and thus educational institutes that are low on capital cannot afford to provide their students the facility of attempting a MCQ based exam. This project thus, aims to cater the needs of educational institutes that are conducting MCQ based examination on a relatively small scale. We have achieved this buy coming up with a cost cutting solution of using only a scanner and taking the entire evaluating process to a computer system. There is also a recurring problem of students not having the knowledge their results on time for the next step in their careers for they have to decide what they can pursue based on the grades earned. We have thus added a feature of relaying the grades of the students to their individual mobile phones via SMS. Thereby eliminating any delay in decision making for the next step in their admission process.

***Keywords**: MCQ, Evaluation, SMS, Grades,*

I. INTRODUCTION

There are various types of examinations present till date. The most basic form of examination or test is a written exam with a question paper and an extensive theoretical answer-sheet. But it is an old method and requires a lot of time to do the manual checking and there is always a possibility of human error. Due to today's fast pace of life and a large number of candidates appearing for any particular examination it has become necessary to evaluate the performance of every student as swiftly as possible. Other than this method of examination there is another way that full-fills the need of swiftness and accuracy in an examination. That method is Multiple Choice question based examination. In this method there are questions asked in the exam to which usually four options are provided. And the candidate has to select the correct one out of these four options and his knowledge and performance will be aptly judged. This method is used extensively in a lot of examinations worldwide. For example: examinations conducted in India that use an MCQ based system include AIEEE, NEET, JEE-MAIN,JEE-ADVANCED etc.

These examinations are conducted on a large scale with an abundance of students appearing for it. Thus these exams have a strong financial support behind them. And thus can buy an exclusive MCQ evaluation machine called Optical Mark Reader(OMR) .Not all educational institutes can afford these machines and a lot of them do not conduct exams/tests on a large scale relatively.

Thus we have come up with a system that does the same work as an OMR would but, we have done so by using relatively cheap components thereby reducing the cost by using a computer system(windows XP or higher),a regular scanner and a custom designed answer sheet, GSM modem sim900 as we are providing a new feature of relaying the grades of the students to their registered mobile numbers via SMS when the evaluation of the all the answer-sheets is done. This feature is incorporated in this project because there are situations where the student does not receive their result on time to start their admission process for the next step in their career.

II. BACKGROUND OVERVIEW

A. Existing System

The existing system of OMR has a dedicated and exclusively scanner which scans the answer sheet which is an NCS compatible scan form and it works by shining light on the answer sheet and identifying the marked answers based on how high the contrast is on the answer sheet. The entire bulk of the answer sheet is loaded together and in a particular order and the scanner scans each answer sheet taking the input one by one and evaluating the answer sheets through the system and printing the result without confirming with the administrator or the authorized person that is allowed to use the machine.

B. Drawbacks of Existing System

- OMR machines are expensive.
- Requires a special NCS compatible paper as answer sheet to get better light reflectivity.
- If the answer sheets are loaded in a wrong order then there is a possibility of error.

C. Proposed System

Our system will have an answer sheet that will be designed in CorelDraw. The layout of the answer sheet will be taken into account by the preferences provided by the educational institute on what kind of exam they are conducting and how they want the candidates to select the options. After this the answer sheets will be scanned in a regular scanner one by one maintaining the order in which they are supposed to be evaluated. The scanner will store the scanned images in a ".jpg" format and these images of the scanned answer sheets will be stored in a dedicated folder, from which the software will select the answer sheets one by one to evaluate and perform the image processing techniques to identify the marked answers and compare this result with the master table which is created and stored in the database by the administrator.

The answers will be compared and the result will be generated. The administrator can now check the data in result table is correct or not. Also the administrator can select the option of clicking the "SEND SMS" button to relay the information about the student's grades and performance .We are also providing an option of a answer-sheet in which the students can mark the answers by making an "X" where they choose to mar their answer. This feature is added to this project to show that the project can be versatile and can also work for various types of optical character recognition.

III. THE PROPOSED SYSTEM

- *System Overview*

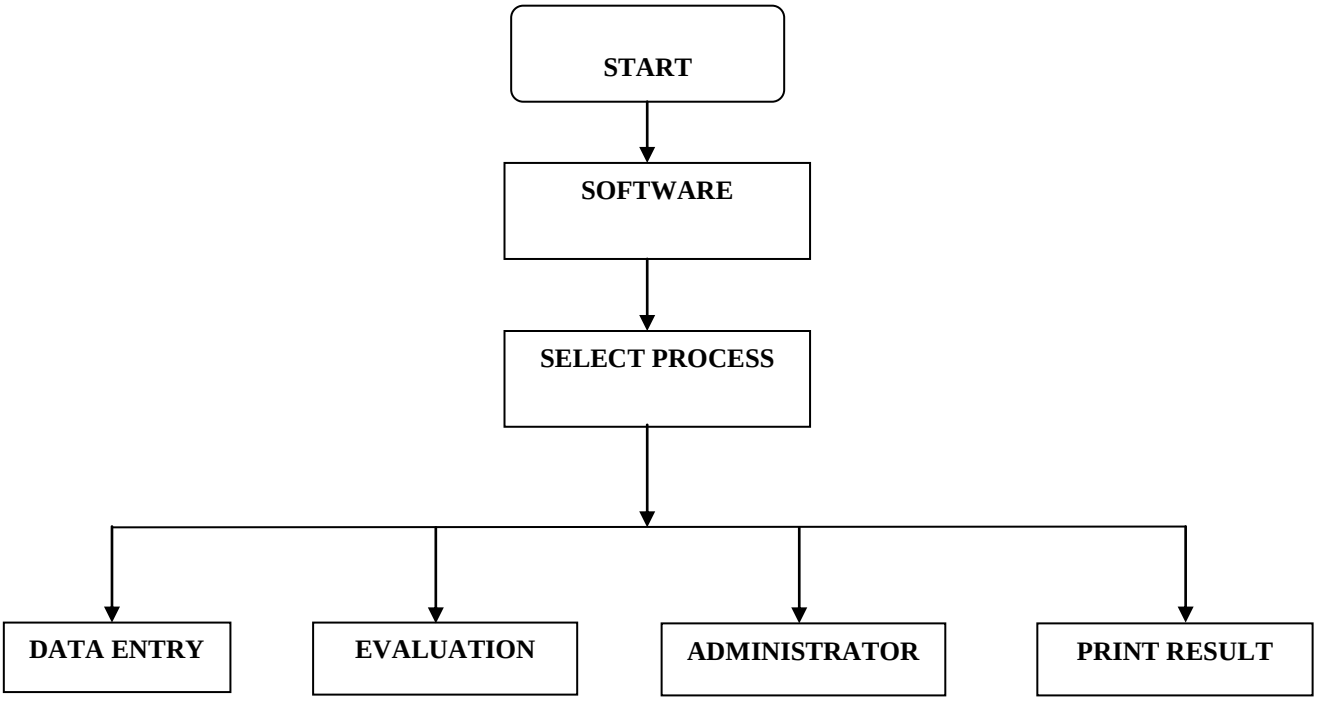

Fig. Basic System outline

- *Detailed architecture of the system*

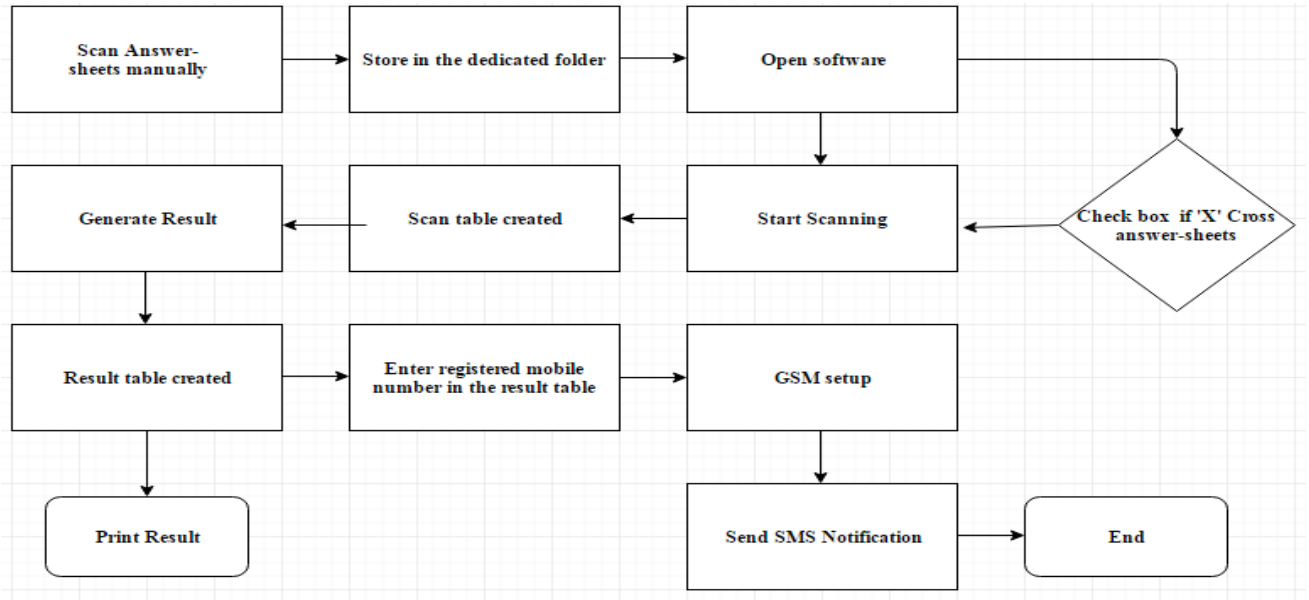

Fig. Methodology of automatic objective evaluation of MCQs and relaying of result through GSM network

Explanations of Blocks

- The administrator scans the answer sheets manually into the computer system and the images of these scanned answer sheets are stored in the dedicated folder from which the software will fetch these images to evaluate.
- The administrator will now open the software and will enter the path of the dedicated folder where the scanned images are stored previously and now the start scanning button will be clicked and the software will perform some image processing techniques and will store the parameters of the scanned answer sheet thus found in the scan table.
- After all the answer sheets are scanned the administrator will generate the result by clicking the generate result button and the results of the students will be stored in the result table.
- Here the administrator will have the chance to review the data and if everything is accurate then he will enter the mobile numbers of the students that are provided by the students and will start the GSM modem.
- GSM modem will start by setting it up, so the administrator will first click the GSM setup and then will attempt to connect the software to the GSM modem (SIM900 module). Once the connection is established the software will return OK and then the administrator can press the send SMS button to start.
- sending the result to the students in an SMS text form one by one by fetching each number of the student, his grade and his seat number etc.
- The administrator will also have the freedom to print the result table to print a merit list of how well the students have performed in a particular examination.
- In this project we have also provided an option for marking the answers by "X" mark just to show that the software can be versatile and in the future can also recognize various types of marks.

- *Technology & Programming Languages*

[A]Hardware components used-

1. Scanner- will be used to scan the answer-sheets manually.
2. Computer system- to run our software.
3. GSM modem- to relay the result to the students

[B]Software Technologies/languages used-

1. Open CV- to perform Image Processing techniques on the scanned answer-sheets.
2. Microsoft visual studio 2010(IDE)- Integrated development environment.
3. Visual C#- coding language.
4. Sql Server management- Database Creation and Management.

IV. APPLICATIONS

- Used in the interview sessions for aptitude tests papers,
- Used basically for evaluation in competitive exams like CAT,I.I.T etc,
- Consumers surveys etc.
- can be used for determine the performance of the staff by taking feedback from the students.

V. LIMITATIONS AND DRAWBACKS

Limitations

- Scanning width should be 500*500 pixels and resolution must be 300 dpi.
- Not suited for everyone's needs.

Drawbacks

This system has certain drawbacks also as listed,

- The sheets are scanned manually, so if a large number of answer-sheets are to be processed then it becomes a tedious job.
- Improper paper alignment leads to wrong scanning of the answer-sheet.

VI. CONCLUSION & FUTURE SCOPE

For flexible use and lower cost, our proposed grading system used scanner to capture answer sheets rather than costly OMR system. Automatic paper correction of questions has a definite role to play in PC-based testing system.

There is always chance to improve any system as research & development is an endless process. The following improvements can be done…

- System can be enhanced in future to support optical character recognition,
- An app can be created that will display student's merit list, topper etc.
- With future improvement in sharpness and quality of scanning a document through smart-phones can be implemented in this project to make the scanning of answer-sheets easier. Cost of scanning can be further reduced.

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