

ONLINE SUBJECTIVE ANSWER CHECKER

Submitted in partial fulfilment of the requirements for the award of
Bachelor of Engineering Degree in Computer Science and Engineering

By

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MARCH 2021



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BONAFIDE CERTIFICATE

This is to certify that this Project Report is the bonafide work of **RANJITHKUMAR.B (Reg. No. 38290068)** and **PALANI BHARATHI.B (Reg. No. 38290060)** who carried out the project entitled **“ONLINE SUBJECTIVE ANSWER CHECKER”** under our supervision from November 2020 to March 2021.

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Submitted for Viva voce Examination held on _____

Internal Examiner

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DECLARATION

I, **RANJITHKUMAR.B(38290068)** hereby declare that the Project Report entitled "**ONLINE SUBJECTIVE ANSWER CHECKER**" **done by me under the guidance of Dr. J.ALBERT MAYAN, M.E.,Ph.D.**, is submitted in partial fulfillment of the requirements for the award of Bachelor of Engineering degree in Computer Science and Engineering.

DATE:

PLACE: CHENNAI

SIGNATURE OF THE CANDIDATE

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ABSTRACT

Today online computerized examination is widely used to automate the examination process and quick evaluation of student saves amount of time for teachers. Hours of time and efforts are required for preparation of question papers and evaluating the answer sheet by teachers in manual examination system. But manual examination system is an effective examination system which involves objective as well as subjective types of questions. To make online examination system as effective as manual system, it requires tremendous amount of time and human effort to build an intelligent system that not only allows taking online examination but also performs automatic evaluation with vast amount of knowledge. In such types of questions, taking user response as an input is easier than the evaluation of answers. This paper is intended as an effort to introduce subjective type of questions in an online examination. The questions are included as one word answer questions and fill in the blanks type of questions. Computer is an intellectual device capable of processing and helping robust question answer by teacher. During entering question answer set, there may be chances of error in preparation of the test specifically to answers. Typographical errors or misspelled word can result into incorrect evaluation. By using computer as an intellectual tool that can be used as a solution for such a problem. Online examination is used in

most of the educational institutes and software organizations having multiple choice questions but by adding one word question answers improves assessment process. This paper is about to design a teacher module to help preparing robust question answer pair set by testing the entered answer for typographical error and generating a set of homophones phonetically similar to the entered misspelled word answer. Teacher model allows preparation of questions for various subjects to test the correctness of the model. Index Terms- Online examination, computerized test, Automatic Evaluation, Objective and subjective tests, MCQ, One word question answer, Pattern recognition, Artificial intelligence, Teacher module.

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INTRODUCTION

Online computerized test with one word answer is required to prepare robust error free answer key. If key contains any misspelled or typographical error in any answer then it will directly affect the evaluation process. For this, a teacher model is designed, developed and implemented that will help teacher for preparing a test by using homophone and semantic map mechanism. The semantic map of homophones is used for fast retrieval of family of homophones by reducing the necessary processing. The model is constructed and evaluated for different types of question of various subjects. By incorporating such types of questions in an MCQ type test help better evaluation of student that not only evaluates objective knowledge of a student but tries to evaluate subjective type of knowledge. For comprehensive evaluation of subjective type knowledge requires more efforts and time but this paper can be considered as a first step toward this direction. The model is tested against set of test cases. Once the teacher model is completed, the test is ready to be conducted for the students. Model uses help of phonetic algorithm for generating, selecting and correcting the misspelled words. The same kind of mechanism can be applied to student model when the student

attempts for an answer. The model is implemented using Java programming language as an open source language. The model constructed in the research paper behaves like having artificial intelligence at some extent by generating and suggesting set of alternatives of given wrong word with spelling mistake. Pattern recognition to recognize homophone family is optimized by use of semantic map construct otherwise it requires more processing of comparison and searching. At last the solution is concluded with future scope.

Chapter 2

Aim and Scope

2.1 – Aim of the Project

The Exam checker has three primary purposes; First is to recognize individual student ID number/name of student, to save or input information of the examination paper to the right student; Second is automatically recorded the result of the checked exam paper directly to the student information, after the process of scanning the papers the result will automatically uploaded to the system; Lastly, tally the frequency of error per items, to easily know what item have the most wrong answers of student; It sort the data file of all the student properly and alphabetically. Automated exam checker system will

detect the examination paper and then recognize the name of the student to sort the information that will be save. This project has data visualization that will give more efficient, clear and better examination result of the student. The automated exam checker system has the following features: To automatically detect the answers of the exam by scanning the papers of each student. To distinguish the error of each items for easily getting the Frequency of Error. To count the correct and wrong answer each items that will provide the result of the examination. Capable of saving information of each student to prevent losing of data. Able to view the result of the examination of the student to prevent shouting of score of each student also to lessen the time consumed. The proponents aimed to develop Automated Exam Checker System for Sucat Elementary School to help the Staff, Teacher, Faculties for easy way of getting better result that will lessen the time of checking and recording the examination paper of each students, to maximize the resources that the school have and also to have a fair checking of examinations. The system is designed in such manner that can operate easily by the users. It doesn't need internet connection to run the program. It is built to run the system offline to avoid consuming of data/internet that can cause hassle to the users.

2.2 – Objectives

The main objective of the project is to develop an automated exam checker for Sucat Elementary School with data visualization, to help the faculty and staff of the school for reliable, efficient and accurate result that will lessen the time of checking and recording the examination paper of each student and to prevent the losses of important data or information.

The specific objectives are the following:

- 1.** To design an automated exam checker system with the following features:
 - a.** Able to recognize ID number/name of the student;
 - b.** Capable of automated checking;
 - c.** Capable of sorting/arranging names of student with their score;
 - d.** Capable of counting the correct and wrong answer.
 - e.** Able to generate Data Visualization;
 - f.** Able to generate frequency of Error;
- 2.** To construct the proposed system as design;
- 3.** To test and improve the proposed project using Alpha and Beta test;

To evaluate the performance of the proposed project using the IOS

2.3 – System Requirements

Hardware Requirements:

- RAM: 4 – 8 GB
- ROM: 64 GB and above
- Processor: Intel i3 and above

Software Requirements

- Windows / MAC
- Python idle

2.4 – Overview of the project

Online computerized test with one word answer is required to prepare robust error free answer key. If key contains any misspelled or typographical error in any answer then it will directly affect the evaluation process. For this, a teacher model is designed, developed and implemented that will help teacher for preparing a test by using homophone and semantic map mechanism. The semantic map of homophones is used for fast retrieval of family of homophones by reducing the necessary processing. The model is constructed and evaluated for different types of question of various subjects. By incorporating such types of questions in an MCQ type test help better evaluation of student that not only evaluates objective knowledge of a student but tries to evaluate subjective type of knowledge. For

comprehensive evaluation of subjective type knowledge requires more efforts and time but this paper can be considered as a first step toward this direction. The model is tested against set of test cases. Once the teacher model is completed, the test is ready to be conducted for the students. Model uses help of phonetic algorithm for generating, selecting and correcting the misspelled words. The same kind of mechanism can be applied to student model when the student attempts for an answer. The model is implemented using Java programming language as an open source language. The model constructed in the research paper behaves like having artificial intelligence at some extent by generating and suggesting set of alternatives of given wrong word with spelling mistake. Pattern recognition to recognize homophone family is optimized by use of semantic map construct otherwise it requires more processing of comparison and searching. At last the solution is concluded with future scope.

Problem statement

In one word answer we face problem of word matching problem in such cases of misspelling if done we have provided the minimum error acceptability like “server” misspelled as “serve” can be consider as answer but words like data with date is not acceptable. The error flexibility actually depends according to the subject for which the

process is developed. So an intelligent reasoning is provided while interfacing.

ADVANTAGES

There are many advantages of online examination systems – they are secure, customizable, reliable, highly interactive, reduced turnaround time and accessible via various devices. Online testing is an objective and systematic evaluation of human abilities, skills, behaviors/characteristics, etc. These assessments take place over the internet using available web technologies. Online testing has become increasingly popular in these areas: education, government and corporate companies. The benefits of online testing include a wealth of assessment opportunities for both the examinee and the examiner providing the assessment. Organizations can receive multiple benefits by making the transition to online assessments, whether it is about a corporation running certification programs, a college adopting an online mode for conducting exams or a training company planning to scale up assessments. Given below are some benefits of switching to an online exam system:

Modules

One word answer questions examination computerized test uses semantic map of homophones, efficient searching procedures and

database to store the prepared question answer set. The process is initiated by selecting a subject by a teacher to prepare the question answer pair for a test. The process depicted here in this model is to simplify the understanding of the implemented concepts and can be modified as per the needs of testing organization. Once the subject is selected the teacher is able to start entering question followed by entering an answer. Once the answer is entered it is tested for validity of the correctness by mean of spell error. If no error is found the question answer pair is stored in the database. No testing is performed on entered question. If the entered one word answer is misspelled having typographical error, it should not be accepted for the effective and correct evaluation of test performed by student. Whenever the evaluation of student is performed it will just compare the answer attempted by the student with the answer stored n database entered by the teacher. So for effective evaluation no such errors are allowed in test. So the correct answer entered by the teacher is tested with large word list also called dictionary of words which having only listing of words with no meaning. If the entered word is found in the word list, it means it has the correct spelling and is accepted. But if no match is found it means it has some spelling error. Now prepared homophone semantic map is searched for recognizing the set of homophones for the entered misspelled word. It is assumed here that the semantic map of word using the large word list is already being prepared which

requires remarkable amount of time to implement and construct. The searching procedure implemented to search homophones is simplified and have acceptable performance compared to direct searching from large word list. The list of found homophone words is propagated as suggestions which are nearer in phonetic sense to the teacher. Now teacher is able to choose correct one and the answer corresponding to the entered question is save in a database. The same process is repeated for subsequent questions. After preparing question answer set for one subject same process is repeated for other subjects. The prepared set is error free as it consists of correct answers without any typographical error that will directly be compared for evaluation and thus it provides preparation of robust test with helping teacher by providing suggestions.

Risks/Drawbacks

The disadvantages of an online examination system:

- Challenges in Technology Adoption
- Infrastructural Barriers
- Difficulty in Grading Long-answer Type
- Susceptible to Cheating
- Transitioning to Open-Book Exams

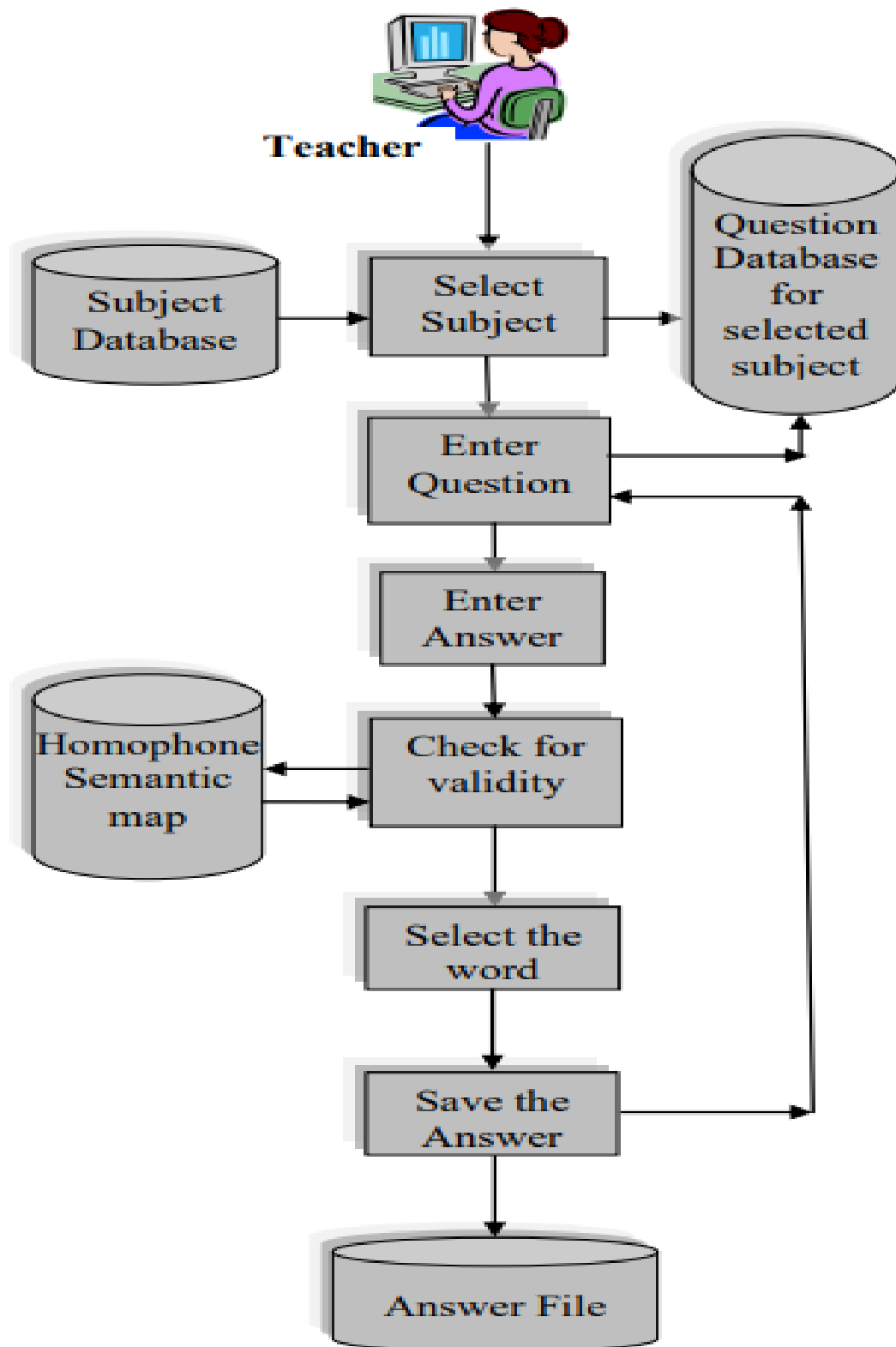
CHAPTER 3

Methods

Online examination is the use of the Internet for examination activities, or we can say, it is the process by which a student learns via the Internet with the help of a subject expert or an examination. How it works? This examination technique involves use of several web-based programs to achieve its goals. Some of these programs or applications are email, an instant messaging, online whiteboards, etc. An automatic answer checker application that checks and marks written answers similar to a human being. This software application is built to check subjective answers in an online examination and allocate marks to the user after verifying the answer. The system requires you to store the original answer for the system. This facility is provided to the admin. The admin may insert questions and respective subjective answers in the system. These answers are stored as notepad files. When a user takes the test he is provided with questions and area to type his answers. Once the user enters his/her answers the system then compares this answer to original answer written in database and allocates marks accordingly. Both the answers need not be exactly same, word to word. The system consists of in built artificial intelligence sensors that verify answers and allocate marks accordingly as good as a human being. The

system will consist of the following elements: Login: The proposed system will have two login facility: User login: The user login is the login allocated for the students. As soon as you click the student login button you will be asked to enter login id and password. The system will check for the id and automatically display students name, email id and phone num for verification. The user login will be able to write answers with respect to the question uploaded. The system will show marks scored as soon as you enter the next button Admin login: The admin login will let the teachers login. The admin login's each user will have his own password and id through which they can login in. The admin can add subtract questions, check for students marks and so on. Just like the teachers can do manually. Answer checking: Suppose the question is "who is hitler?" Case 1: Was a cruel ruler Found the narzi party. In this case the anwer will get 10 points for correct answer Case 2: Was a cruel ruler. Found the BJP. In this case the statement 1 is right and 2 is wrong so will be given 5 points out of 10 as only half of the answer is correct. Thus depending on answers the points of the answers will be set by the admin.

3.3 – Block Diagram:



The Context Diagram shows the main process of the entire proposed system operation, assembles the process in details into segment for quick review of the system. Figure will show how the system run,manipulate and process the automated checking of the examination.

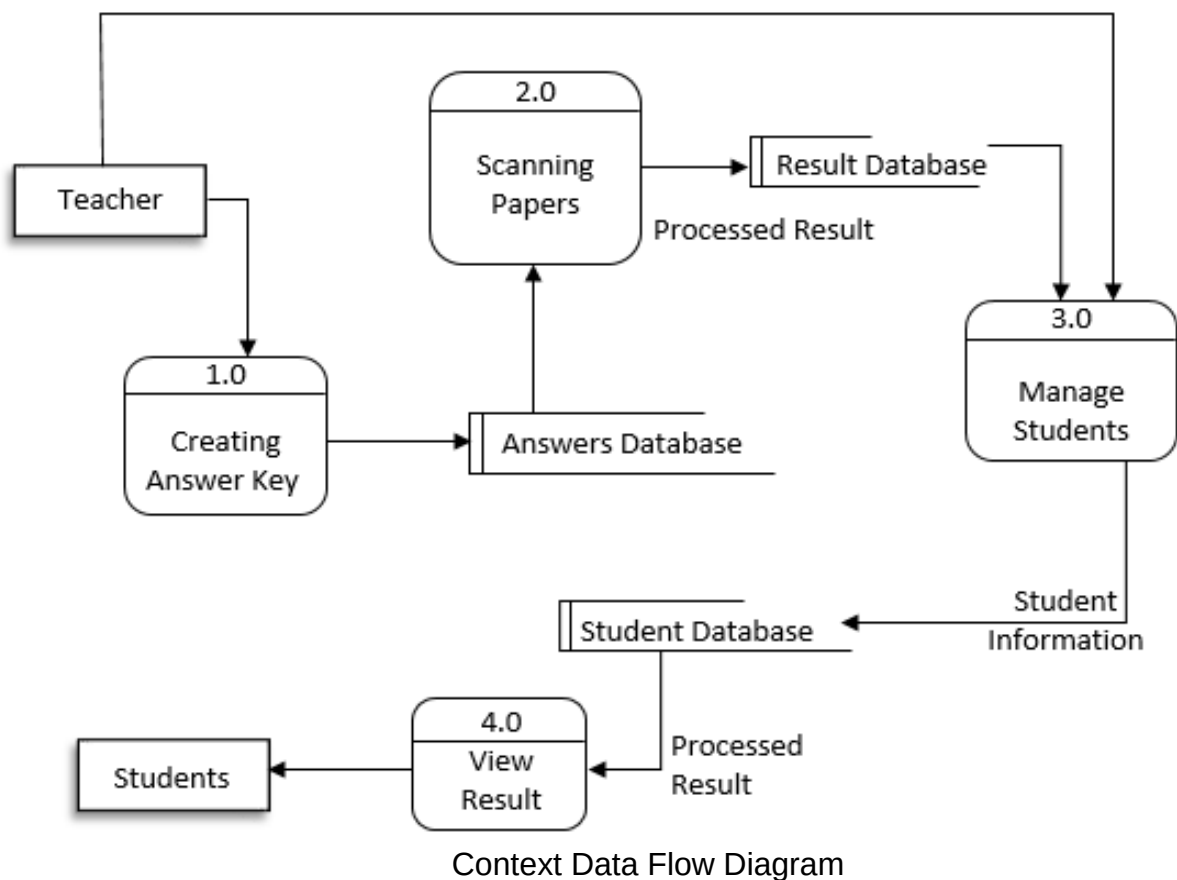


Figure shows the main purpose of the proposed system which are automatically check by the system. Creating Examination key is one of the main purpose of the system is allow create and edit the correction key of the examination. The faculty, Teacher, ad Staff are the one who can manipulate

the entire system. The system will automatically scan, check, count the scores, and save the result of the examination. Student can only view the records of the examination paper. Students are not allowed to handle the propose system to prevent cheating, student might edit the records to have high scores in exam.

Requirement Documentation

The proponent will make system that can help th Elementary School more efficient and convenient in Checking Examination papers of the Student. Having an Automated Exam Checker System with Data Visualization allows the School to save time and increase productivity since the checking of examination papers will easily check. Teacher, Faculty, and other Staff of the school will have time to rest and can be start new lesson in advance. The structure of the Automated Exam Checker System with Data Visualization is based on the needs and preferences of the user. The diagram below shows the structure of the system in relation with user

Functional Decomposition Diagram for Automated Exam Checker System with Data Visualization

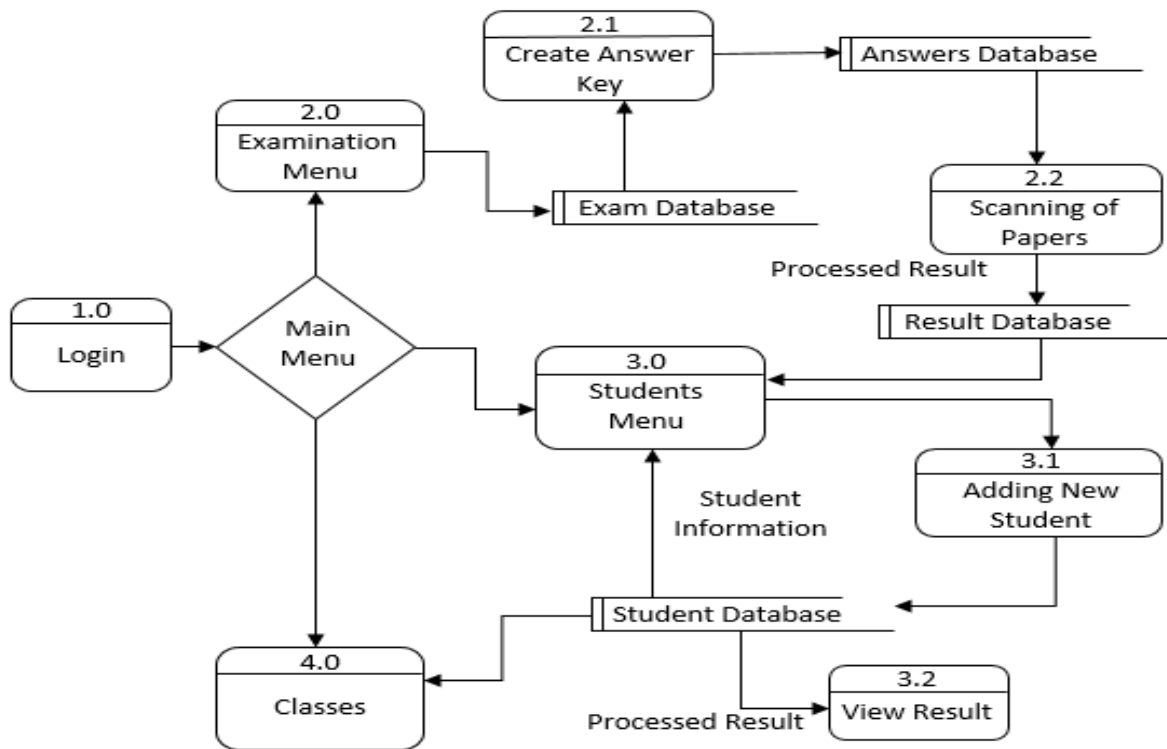


Figure shows the incremental process of the proposed system. It shows how each entity are distributed and grouped by its function. Based on the given diagram above, the Automated Exam Checker System with Data Visualization can only be run using a Computer Based. Each section is described as follows: Examination, provide creating new Examination papers, Editing Key, Scanning Papers, Reviewing papers. Editing key is creating an answer key for the selected answer sheet. Scanning Papers will scan the examination paper of the student. Reviewing Papers will provide reports of the scanned papers. Students Menu, this module Add New Student in the list. See result of the test

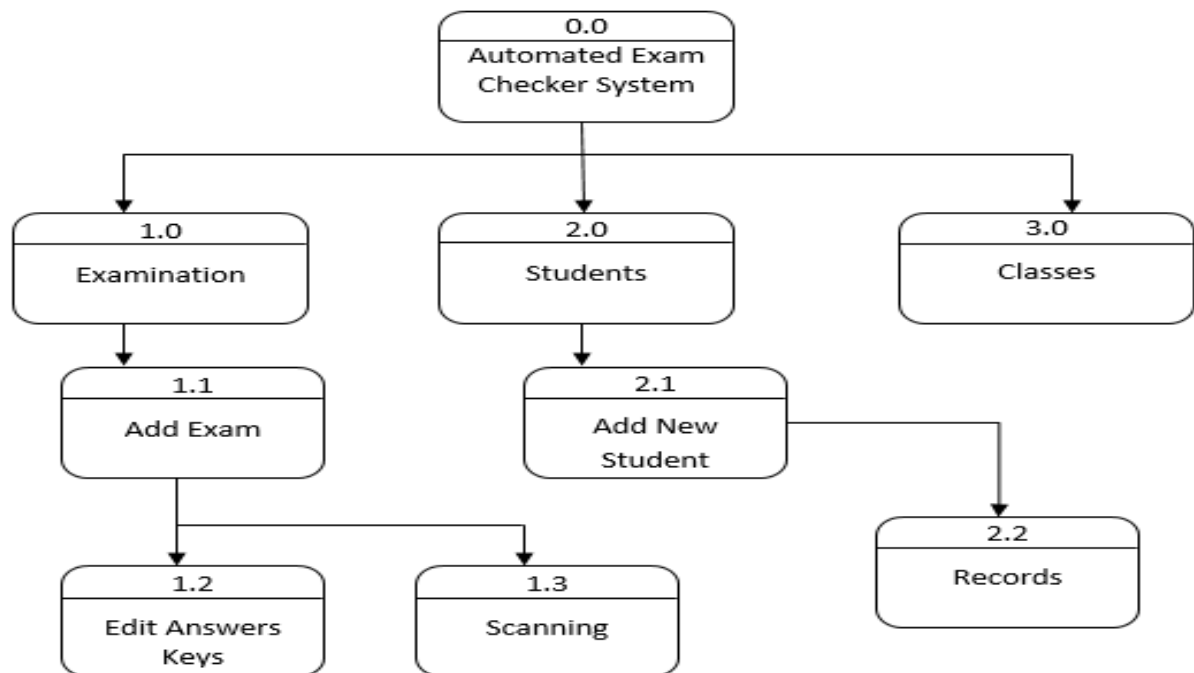
in each student. Classes, creating a Class or Section with the list of student. And also a subject that will be having an examination

CHAPTER 4

RESULTS AND DISCUSSION

Project Description

The Automated Exam Checker System aimed to help the Staff, Teacher, Faculties for reliable, efficient and accurate result that will lessen the time of checking and recording the examination paper of each students, to maximize the resources that the school have and also to have a fair checking of examinations. To help the school to have an easy way of getting the better result of examination that will automatically tally each number of item and to lessen the time of recording the student examination papers. The system able to process one by one paper to be scan and recognize each examination papers. The system is designed in such manner that can operate easily by the users.



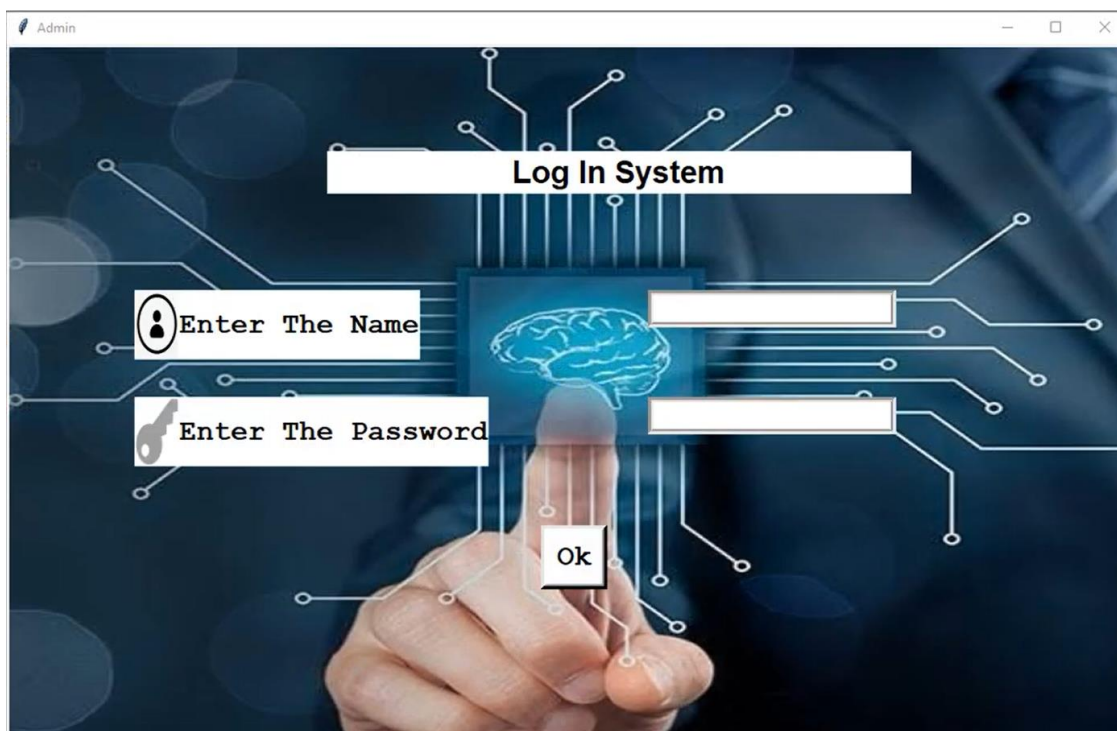
Project Structure



Figure shows the Main Scene for Automated Exam Checker System. The main scene will always show every time the user runs the program. The

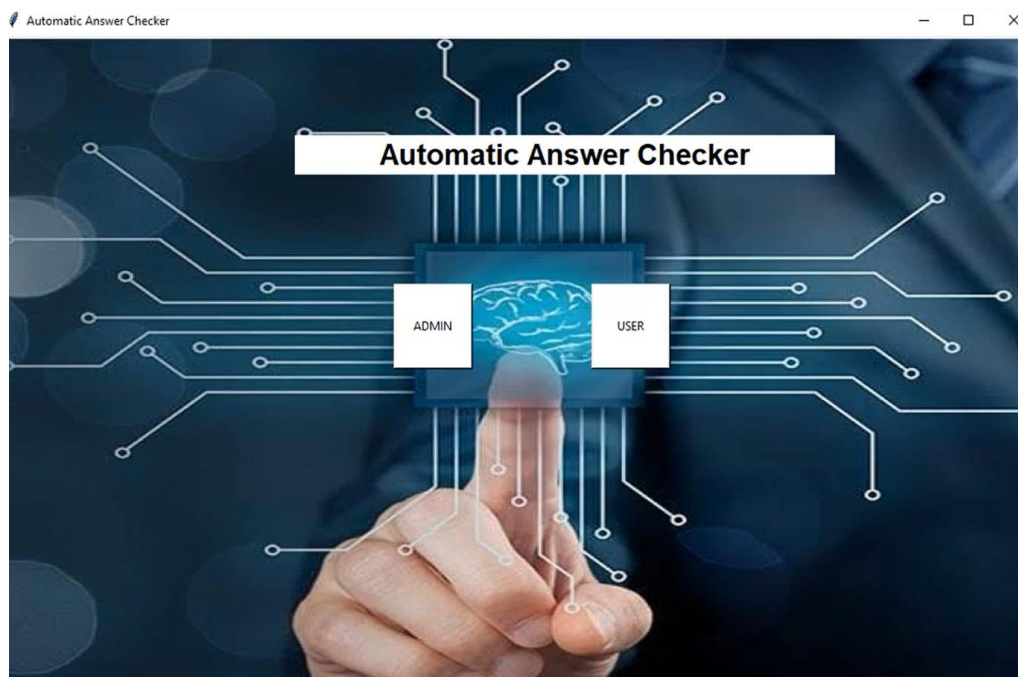
main scene is just a quick preview that take 5 seconds before it changes to Log-in Forms.

The program has three (3) major sections that are categorized by its functions and capabilities. The first is the Examination Section that houses the creating or adding of exam, editing keys, scanning papers, and the result. The second one is Student Section that consists of adding student and records of all student. The last one is the Class Section where all the student arranged by each section.



Login Form

The figure show a Login in the system, in this form identify and filtered out the users who using the system. Input your username and password and system verify your account. If your account is correct the system will verify and then you may proceed to the main menu. Else if not there will be a warning message that the account you entered is not authorized to access the program.



Control Menu / Main Menu

figure show Main Menu of the system, in this form, user can choose where in the system want to go. As we can see in figure 10 there are three (3) major sections that are categories by its functions. The Examination where the users can add or create exam, editing keys, and scanning papers. The

other one is Student that handles all the records and information of all student, and also handles the registration of new student. Last one, the Class where all the student arranged by each section. All of this three major section handles different forms of the system but connected to one another.



Examination Form

The figure show the Examination Form, if we click the Examination at the left side in the Main Menu figure will show the examination form where you can start adding exam, checking exam, viewing result, editing keys and scanning papers

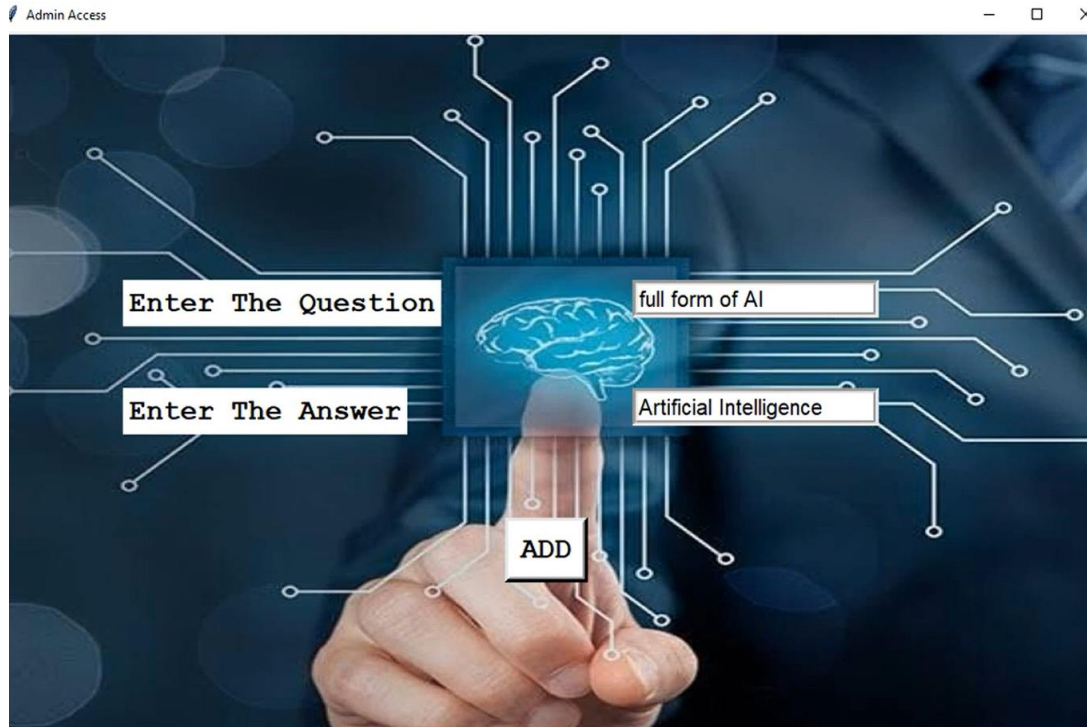


Figure Adding Examination Form

The figure will show Adding Examination Form after clicking the Add button in the examination form at the Main Menu, the user was created Title for the student examination. To recognize what Examination should be process or should be done. After clicking the Save button or simple saving the examination title, it will be listed in the examination menu. Figure 13 will show where the saved title will proceed after saving it. before clicking the delete button.



Figure Adding of New Student

The figure show the Adding of New Student, entering the specific information of the student that will be added. After inputting information of student, the data or information will save at the SQL databases.

Project Capabilities and Limitations

The following are the capabilities and limitations of Automated Exam Checker System with Data Visualization: A Computer-Based program for the Sucat Elementary School.

Capabilities

1. The programs allow the user to login before accessing the system.
2. The program is capable of creating or adding new examination.
3. The program is capable of creating correction keys.

4. Capable of scanning examination papers.
5. The program also capable to save the scanned paper of examination to the corresponding student.
6. It can also show the result of all examination in each student.
7. Registration of new student is also one of the capabilities of the program.
8. Program also capable of sorting student in each section.
9. The program can remove student in list or records.
10. The program can be run in without the internet connection.

Limitations

1. The program is intended only for Sucat Elementary School.
2. Student are not allowed to access the system.
3. Student can only view the result with the help of the teacher and faculties who can only access the system.
4. The scanning of papers can only scan one by one.
5. The program can only be installed and run using a computer or laptop.

Project Evaluation

To evaluate the project capabilities, the proponents conducted an actual testing and evaluation process for the application. The evaluation instrument was based on the characteristics and sub-characteristics provided by ISO/IEC 25010:2011 Evaluation Instrument. The evaluation instrument provides numerical

rating to scale the criteria for the prototype and software materials, where five (5) is the highest and one (1) is the lowest. It suggests a software metrics (Excellent, Very Good, Good, Fair and Poor).

Chapter 5

Conclusion

1. Based on findings, the researchers can conclude that the system was design with features that can give the fastest way of processing the checking of examination papers of Sucat Elementary School. Capable of sorting/arranging the names of the student with their score, capable of counting correct answers and able to generate Data Visualization. The researchers conclude that the proposed system was tested.
2. They found out that the system was able to provide eases way of Checking the Examination papers of the student and saving the result or the information of the student properly. That the Automated Exam Checker System was constructed as not necessary designed by the user desire.
3. That the system had been successfully tested for functional Suitability, Performance Efficiency, Compatibility, Usability, Reliability, Security,

Maintainability, Portability by IT experts and tested by the actual users on the area of functionality, content, reliability and availability.

4. That the system where evaluated by the IT experts with an overall mean score of 4.26 and was rated “Very Good” and evaluated by the actual users with an overall mean score of 4.44 and was rated “Very Good” based from the evaluation, prepared and adopted from the Automated Exam Checker System with Data Visualization.

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