Implementation of Descriptive Examination and Assessment System

Nilima Sandip Gite

K. K. Wagh Polytechnic, Nashik, Maharashtra, (India)

ABSTRACT

In conventional Online Examination System, just multiple choice questions are evaluated and according to that marks will be obtained by candidates. However, this technique lacks the capability of evaluating descriptive answers. Automation of descriptive answer assessmentprocedure would be useful for various universities and academic institution to proficiently handle the assessment of exam answer sheets of candidates. Objective type of Examination evaluation is easy as compared to the descriptive type of question evaluation. The online examination system with objective questions and other forms of one mark answers were not suitable to evaluate the knowledge of a candidate. For this descriptive examination is the single way toassess the understanding of candidate. Therefore the automated system must be capable of evaluating the descriptive answers.The aim is to implementthe system for the automatic assessment of multiple sentence descriptive answer. In this paper, comparison based approach is undertaken where candidates' descriptive answers are compared with a specific standard descriptive answer stored on the server machine. The approach is mainly based on text mining technique which involves keyword matching, sequence matching.

*Keywords***:** *Assessment,Descriptive Answer, Text Mining*

I.INTRODUCTION

In universities and board examination a large number of candidates are given their exams. Every descriptive answer written by candidate is evaluated manually because there is no proper alternative for manual evaluation. The volume of evaluation increased a lot and it becomes difficult to handle all these corrections in a manual way. And also it becomes hard to give the results within the time. The assessors are facing the stressful situations to correct many papers within short time. Because of these rules and conditions the assessors sometimes cannot do the better justification to the candidates in showing the difference between appropriate answer and inappropriate answer, which may not satisfy the expectations of the candidates who wrote the exampaper well and it leads to the reassessment of paper. Again for reassessment of papers, they need many resources like assessors, material, storage of papers, constraints time duration etc.,In some cases, some candidate having the poor hand-writing which is not clearly understandable by assessor. Hence, to avoid such problems the automated examination environment is developed.

The novel approach is to explain an automated descriptive answer marking structure that can be utilized to improve teaching and learning of the particular subjects.Question paper is prepared by the expert teacher and uploaded in the software on the required format. Candidates give the online test in the examination center. Confirmationof the candidate has been provided in the system. On successful authentication, eachcandidatewill gets the online question paper. They are required to answer the questions by typing the answer in the blank

space.When candidate completed the typed answer the software assists them by saving the answer. In case of a system failure, the saved work is available to the candidate for continuation.

II.RELATED WORK

A Python Tool For Evaluation Of Subjective Answers (Aptesa) :ApTeSa is a tool implemented for automated assessment of descriptive answers. ApTeSa uses a smart and efficient technique to analyze the answers. Thistool is developed using PyQt, Python and its modules: pyuic, xlsxwriter, Platypus andReportlab[1]. ApTeSa works either in a Semi-automated mode or in full automated mode. Semi-automatedmode give the option to faculty toreassess an answer andupdate the results. This shown that the Semi-automated mode gives moderately enhanced results than the complete automated mode.ApTeSa evaluates the descriptive answers by equivalent keywords and phrases in the answer given by the candidate, with the keywords and phrases of the original answer. The keywords and phrases of the original answers are stored in the answer base of the system. Answer base contains the entities for keywords and phrases, along with the no. of marks to be given for each of their existences.

Thomas N. T. Ashwini Kumar and Kamal Bijlani implemented e-learning system like Learning Management System (LMS) to assess candidates descriptive answers and provide immediate feedback to teachers. This is implemented by comparing candidates answers with teacher's ideal set of answers using latent symantic analysis. Then evaluating order of previous and upcoming words in the answer using positional indexing based on the keyword list added by the teacher. Then final score is generated

Meena K and Lawrance Raj evaluated candidates' answers online using Hyperspace Analog to Language (HAL) procedure and Self-Organizing Map (SOM) method [3]. The answer is given as input to HAL. HAL represents a procedure that processes a corpus of text and produce numeric vectors containing information about its meanings. The clustering method of Kohonen Self-Organizing Maps is applied to the vector. SOM is neural based technique. It takes the vectors as inputs and forms a document map in such a way that nearby neurons contain a similar document. The proposed method will be tested with short answers written by learners of our department. This method has a number of benefits like increased reliability of results, reduced time and effort, reduced burden on the faculty and efficient use of resources.

C rater [4] is a technique used for the content scoring. This content scoring is based on model building which makes various answer model for candidate's short answer. ETS (Education Testing Service)[4]is used for examiningsmall answer of candidate having near about 100 words. It uses systematicmethod&rubricselement which specify accurate&significant terms which should be exist in candidate's answer. The problem of dissimilar answer contents of candidate is resolved using c-rater. *C rates includes the steps like* Model building, C Rater automatically processes, Maintaining algorithm gold map, Apply candidate answer.

IndusMarker[5]matching the structure of answer text in terms of predefined structure which is developed by structure editor which built for purpose. The teacher provides the essential structure of an answer in a simple purpose designed language. The language was originally namedQuestion Answer Language(QAL)[6] but later on it is renamed as a sublanguage of XML and called it Question Answer Markup Language (QAML)[5].

III.PROPOSED SYSTEM

Several methods have been suggested for descriptive answer assessment. The approaches are mainly based on text mining technique which involves keyword matching, sequence matching and quantitative analysis and semantic analysis.

3.1 Text Mining

The purpose of Text Mining is to process unstructured (textual) information, extract meaningful numeric indices from the text, and, thus, make the information contained in the text accessible to the various data mining (statistical and machine learning) algorithms. Information can be extracted to derive summaries for the words contained in the documents or to compute summaries for the documents based on the words contained in them.

Text mining is used to extract important information or data or pattern or knowledge from the exam owners and candidates answer which are in the unstructured form. The main purpose of text mining is to find valuable information from natural language text. After the text mining is applied the words like am, is , are ,was etc. are neglected by the system and we get keywords from the answer. After the finding out the keywords system shows total number of keywords to the exam owner. As per the number of keywords exam owner can decide marking scheme to that particular question.

3.2 Indus-Marker Algorithm

Indus-Marker Algorithm is used by the system to perform structure matching, i.e., matching the written answer with the predefine answer structure. It is possibility that candidate can use synonym of any words for that purpose WordNet 2.1 API is used in the system. WordNet 2.1 provides synonyms of keywords to the Indus-Marker algorithm A marking scheme is decided with number of keywords match with candidates total number of keywords Indus-Marker provide number of keywords are matched.

IV.APPLIED METHOD

Fig. 1 shows the basic working of and work flow of implementation of descriptive examination system. Here the candidate is an external entity. The candidate/ student register in system as an applicant. Exam owner will create exam and manage questions while applicant can give exam. Along with the examination details , candidate will also have instant result and hints provided for each question.
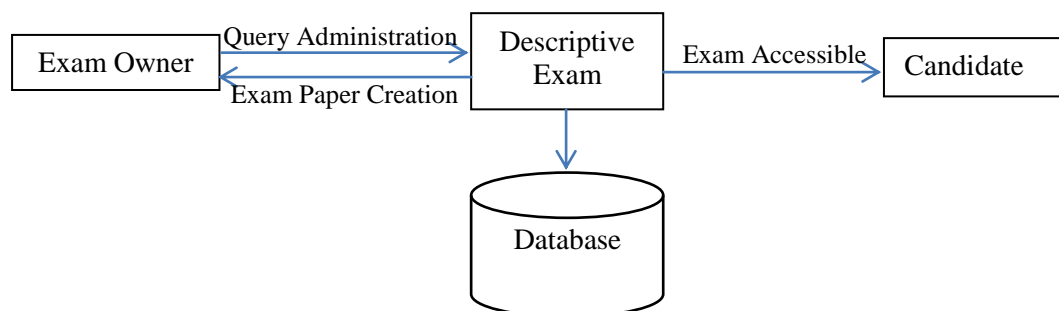

Fig. 1

Proposed System mainly consist of three modules as below

1)QueryAdministration: This module performs operations likecreating exam slots, updating questions, deleting,

adding the questions along with appropriate answers

2)Exam Paper Creation: This module fetches questions from database and creates examination paper randomly.

3)ExamAccessible: After that exam paper will be generated and is available to the candidate. Now candidate could

givethe exam. When exam will over, automatically score will be visible to the candidate itself. Atany time, candidate could login into the system and use the notes uploaded by the faculty.

V. IMPLEMENTATION DETAILS

In this a web application for descriptive type answers checking and its automatic assessment is implemented .Till now the systems are developed for the Automatic Evaluation of Single Sentence Descriptive Answer but by using this application automatic evaluation of multiple sentence descriptive answers is provided.

Following are the main user interfaces used in the system.

1. Creation of Exam Slot
2. Exams Offered
3. Descriptive Exam System
4. End result of Descriptive Exam

1. Creation of Exam Slot: In this page the exam owner creates the exam by considering the factors like Duration of exam(in minutes), Date, Start and End time of the exam, Publish Start and End Date of the exam

Fig.2

2. Exams Offered: The candidate can register for the various examination information loaded within the system, he/she decides his/her interest and according to his/her interest the exam advertisements are publish to his/her account.Fig. 3 shows list of exam that can see by the candidate.. By clicking on any one of the exam, he/she could give theexam.
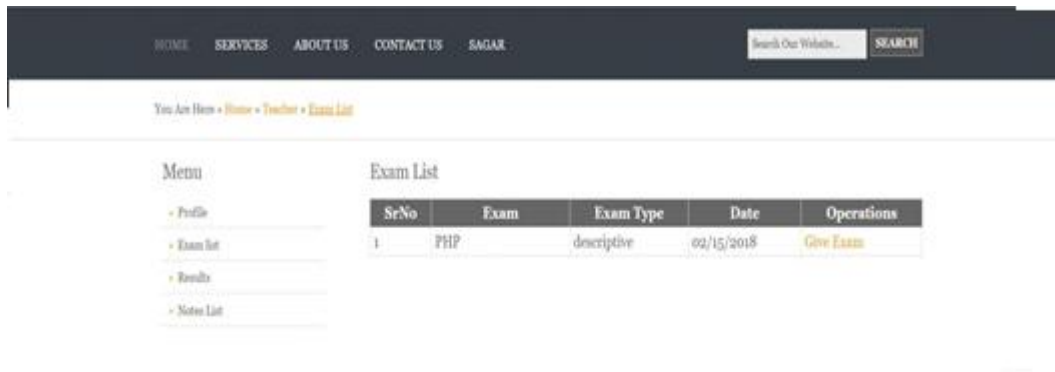

Fig. 3

3. Descriptive Exam Form: This page is for descriptive examination test where candidate can write answer of the question in the given blank space. By clicking on the submit button the answer will be submitted to the server.
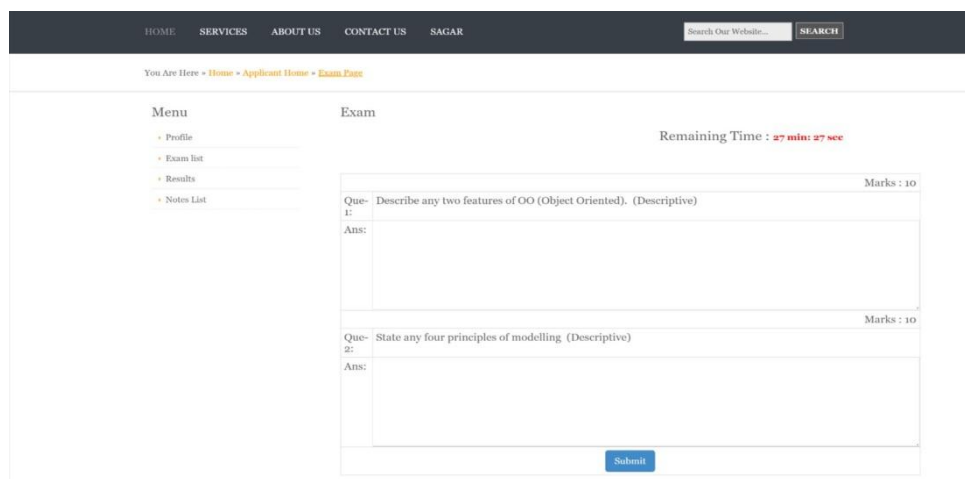

Fig. 4

4. Result of Descriptive Exam: When candidate submit his/her last answer by clicking on the submit button immediately the result gets calculated and displayed on the screen.
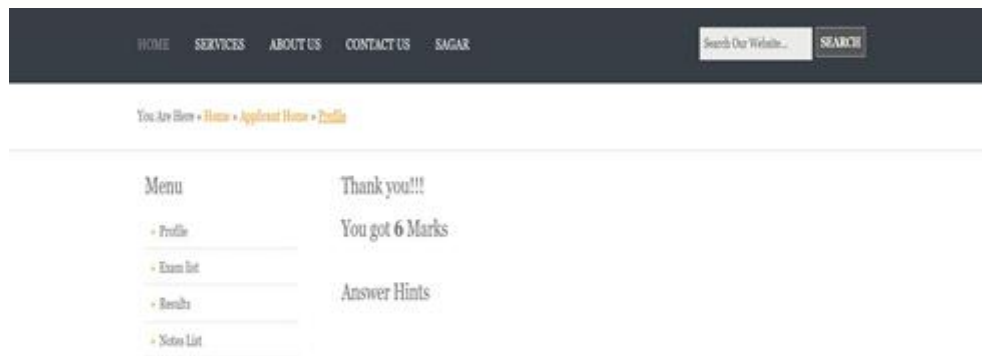
Fig. 5

VI.CONCLUSION

In this system candidate's descriptive answer and predefined answer is compared according to keyword matching, sequence matching andWordNet 2.1. The algorithm provides a key for the automation of descriptive answer evaluation process. Automatic evaluation of descriptive answer would be advantageous for the universities, institutes and boards for academic purpose.

REFERENCES

[1] Dharma Reddy Tetali, Dr. Kiran Kumar G, Lakshmi Ramana, PYTHON TOOL FOR EVALUATION OF SUBJECTIVE ANSWERS (APTESA), Volume 8, Issue 7, July 2017, pp. 247–255, Article ID: IJMET_08_07_029, International Journal of Mechanical Engineering and Technology (IJMET)

[2] Thomas N. T. Ashwini Kumar and Kamal Bijlani , Automatic Answer Assessment in LMS using Latent Symantic Analysis, Second International Symposium on Computer Vision and the Internet, Procedia Computer Science 58 (2015) 257 – 264 and Elsevier.

[3] Meena K and Lawrance Raj, Evaluation of the Descriptive type answers using Hyperspace Analog to Language and Self-organizing Map, 2014 IEEE International Conference on Computational Intelligence and Computing Research

[4] C. Leacock and M. Chodorow, "C-Rater: Automated Scoring of Short-Answer Question," Computers and the Humanities, vol. 37,no. 4, pp. 389-405, 2003.

[5]RaheelSiddiqi,Christopher J. Harrison and RosheenaSiddiqi,"Improving Teaching and Learning through Automated Short-Answer Marking", IEEE transactions on learning technologies, vol. 3, no. 3, July-September 2010.

[6] SalvatoreValenti, Francesca Neri and Alessandro Cucchiarelli,"An Overview of Current Research on Automate Essay Grading "DIIGA Universita ' Politecnicadelle Marche, Ancona, Italy,Journal of Information Technology Education Volume 2, 2003.