



## AN EFFECTIVE PAPER EVALUATION USING NATURAL LANGUAGE PROCESSING

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### ABSTRACT

In this fast-developing world, where the people move toward automation so, there is a need for automation in the answer evaluation system. The popular system takes more effort and time to evaluate the answer. Since in hand-operated answer evaluation, the manpower and the time loss are much more. This application scheme provides an automated evaluation of solutions based on the keyword provided to the application in the form of the input by the arbitrator which will provide even distribution of marks and will reduce time and workers. Currently, the online answer evaluation is available for MCQ based questions; hence the evaluation of the theory answer is restless for the checker. The teacher manually checks the answer and allots the marks. It is the application based on the evaluation of answers using machine learning which diminishes workers and time decay. Also, in the manual system, it may be possible that the points awarded to the two same answers are varied. A smart paper evaluation technique is a web-based application used for error-free and smart paper evaluation using text summarization. In which the paper can be evaluated within seconds. In the present scenario the evaluator takes more time to read the long answers and evaluate the paper. To evaluate the within a short period of time keywords within answer the answer key is compared with the candidate answer sheet. This system uses two approaches: an online assessment technique and a scanned text document technique depending on the type of input. In the future, this project aims to provide a simple and smart way of valuation.

**Key words:** Latent Semantic analysis, Optical Character Recognition, Natural Language Tool Kit(NLTK), Text summarization

### 1. INTRODUCTION

In this modern world, the education system has become a vital thing. Every developing country has its criteria for teaching the scholars. Education practice not only focused on the classroom learning but beyond it so many other platforms like online courses, video tutorial etc. Not only their reasoning but also the examination and evaluation method are becoming an essential notion. The current way of paper checking method consists of setting up of valuation camp, assigning mentors, etc., this requires a huge amount of time and attention. Checking of paper is a tedious task and which can vary based on the emotion of the evaluator. To solve this problem a new technology is applied. Here comes a web app solution for the answer evaluation system present in our society. It will assist evaluators in paper judgment. All the answer valuation progress can be made online with automatic valuation. This operation is done using machine learning concepts. The arrangement will generate marks on the pupil's answer paper. The main aim of this project is to guarantee user friendly and interactive software to the users. The online evaluation system is more durable and a distinct approach to defining all relevant marking schemes. It yields sufficient transparency to the present method of answer checking.

### 2. RELATED WORKS

It mainly deals with different ideas of text summarization strategies and taxonomy of summary evaluation methods. In NLP (Natural Language Processing) based semantic analysis for legal text summarization, it forms short and useful details or summaries for very long judgments. Here we are using the NLP technique called LSA (Latent Semantic Analysis) to seize concepts easily. It quickly examines the relationship between various sets of documents and a set of terms. The semantic analysis makes sure that the declarations are correct.

It also makes sure that the statements of the particular program are semantically correct. It assures whether it is fair and consistent. The pre-processing includes the result section of the input document. Here it considers the text to be summarized for judgment. Mainly there are two types of legal documents. One is a Trained Latent Semantic Analysis (TLSA) model or a multi document and the other is Untrained Latent Semantic Analysis model or single document. They are automatic text summarization technique mainly used in Natural Language Processing (NLP) field to get sufficient information and also for space expansion. In Sentence selection, select key sentences based on the node value of graph representation. After all, these process top and important sentences are extracted[1].

A survey on extractive text summarization obtains the necessary information from authentic text. Extractive text summarization deals with unsupervised learning method and supervised learning method [3].

Extractive text summarization using sentence ranking deals with automated text summarization. They are used to identify the most relevant and vital information from a document. It comprises two methods; abstractive text summarization and extractive text summarization. Extractive text summarization identifies an important section of text and offers a subset of a sentence from the original. It includes pre-processing and processing of the text document. Natural Language Tool Kit (NLTK) is used to implement extractive summarization and also the input and output of the document[2].

Automatic text summarization of Wikipedia articles identifies the most important information from the text documents. Here Natural Language Processing (NLP) understands and generates text in natural language. The input text is sentenced to perform tokenization, i.e. it chops the character into pieces called token. Then stemming is used to generate root form of the inflected word. Then feature extraction is used to reduce raw data for easy and exact processing. It makes use of feed forward neural network with a single hidden layer. Then it undergoes sentence selection and the output of the summary is generated [4].

Automatic text summarization of news articles is similar to that of the Wikipedia article. It undergoes pre-processing of the input data, text summarization, noun filtering, lexical chain generator and sentence extraction[5].

### 3. PROPOSED APPROACH

This system is designed in such a way that the evaluator can easily evaluate the answer sheet. It overcomes the disadvantage of the traditional paper evaluation techniques. The traditional answer checking is notably time-consuming and needs more logistic activities. It is a solution to our present scenario. The various processes in paper valuation take place as it is shown in Figure 1.

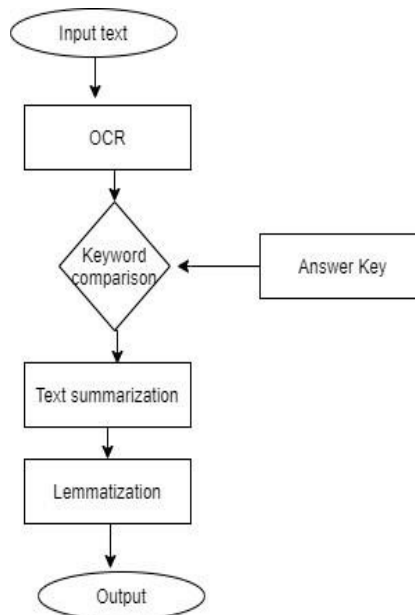


Figure 1: System Block Diagram

The proposed system should be able to check the answer script in 2 methods:

- Onlinemethod
- Offlinemethod

In both cases the answer script is compared with the given answer sheet and forming the result. This automatic valuation system is done using a machine learning concept. This web mainly focuses on two types of users:

- Website admin or teachers
- Students

The website admin upload answer key, answer sheet, question paper (for the offline exam) and evaluate the answer. The students mainly concentrate on online exam answering and score checking. There is a login and registration port for teachers and students. The teacher who is in charge of the valuation of the corresponding subjects can access the site to check the answer script.

### 3.1 Offline method

In this method the uploaded scanned copy of the hardware answer script in the form of pdf/png and the uploaded answer key is converted into text form by Optical Character Recognition (OCR) as shown in Figure 2. This generated text file of answer key and answer sheet is used to exempt the keyword or important words by means of pre-processing methods which include abstractive summarization. This summarized keyword is compared with the answer key by using a depth algorithm like NLTK. The mark is awarded for the keyword present in the answer sheet. Once the evaluation is completed the total score will be shown to the teacher and the teacher will enter the mark into the database. Then the student can view the score of the corresponding subject in the portal.

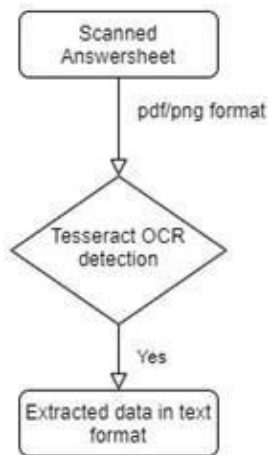


Figure 2:Offline method

### 3.2 Online method

In the online method, the teacher uploads the question paper and also the answer key. The student enters the website by registering can take the test online, after the test completion the evaluation is done by the same method by comparing it with the answer key. Once the teacher accesses the website, this generated mark will be shown to the teacher. Then the teacher uploads the mark to the website in order to access the student from its portal. Figure 2 explain various steps done during online method.

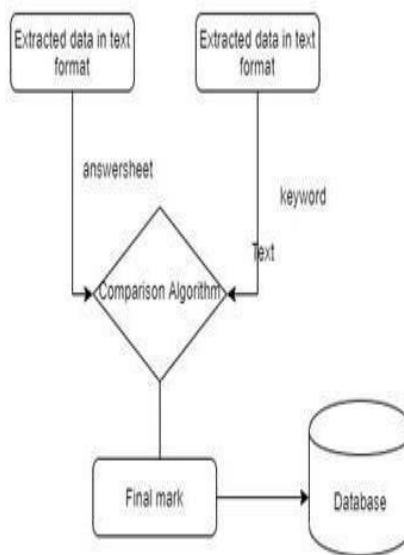


Figure 3: Online method

## 4. EXPERIMENTAL RESULTS

Text summarization plays a very important role in our daily lives and has been studied for several decades. With the arrival of information agenda, the emergence of multimedia technology and data which include text, image, audio, and video, has progressed dramatically. Reading the entire information or text demands more time moreover makes it challenging for the users. The traditional paper checking process is really time-consuming and not even reliable because of obvious human error factor. So, it generates a system that can automatically generate the abstracted form of the given document. It is a technology that improves the current examination paper checking process. This makes the evaluator to easily assess the answer paper. The keywords in the answer sheet are compared with the keywords in the solution key and output of paper evaluation is generated in a summarized form this help to distinguish the mark and grade of the candidate and also displays whether he or she is passed or fail. This system is fully efficient, improved and well-organized.

## 5. CONCLUSION

Evaluation of subject answer checking isn't a new insight. It has been in the works for a decade and a half. A large number of techniques were examined to resolve the difficulty efficiently. The techniques reviewed and executed within this project should have a high agreement with human performance.

The project works with the same circumstances which an actual human being reflects while evaluation such as length of the answer, presence of keywords, and context of key-words. Use of Natural Language Processing copulated with robust classification techniques, checks for not only keywords but also the question specific things. Students will have a certain degree of independence while writing the answer as the system checks for the presence of keywords, synonyms, right word context and coverage of all concepts. It is concluded that using ML techniques will give adequate results due to holistic evaluation. The accuracy of the evaluation can be increased by serving it an immense and accurate training dataset. As the technicality of the subject matter changes several classifiers can be employed. Further refinement by taking feedback from all the students and teachers can improve the system meticulously. This system can be popularly used in academic institutions such as schools, colleges, coaching and institutes for correcting answer sheets. It can also be implemented in diverse organizations that handle competitive examinations.

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