Digitized Exam Paper Evaluation

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Abstract: **At the present time evaluating an exam papers and declaring end result in a restricted period of time is a difficult task for educational schools, colleges, institutions, departments and Universities. Thus manual exam paper correction becomes more difficult and many fraudulent activities are happened today. To make it easier and more accurate the proposed aim is to develop a software for automatic exam paper evaluation and grading system, the system works by scanning the handwritten written exam papers then the scanned image be improved into an editable text using OCR tool and the evaluation will perform by matching the key terms which is maintained in the template. It is entirely integrated approach upon dissimilar level of knowledge by the method of examination, evaluation, result and formulation of subject papers. In a field of education though teaching, evaluation and the performance method many organizations initiated with the use of advanced technologies. The approach of evaluating the examination papers is evolved although use of computer wherever the utilization of computer is obligatory in every varied techniques for analysis. This paper structured in different patterns such as offline, online and the manual exam paper evaluation with different analysis and techniques.**

Keywords— OCR; Ontology; Machine Learning; Evaluation System

I. INTRODUCTION

Nowadays many people exploit images to represent and symbolize information by converting an image into digital form where different operations are performed on it for the extraction of information though the techniques of image processing. The important information that extracted from images is furthermore popular. Image recognition be a vital analysis half for wide applications. Within the comparative pattern recognition field of pc, the one difficult task is actual automatic recognition of individual human handwriting. Even though, the variances do not origin any struggle to human. Yet, but it is further complicated to instruct computers towards recognize wide-ranging handwriting. Intended for image recognition difficulty such since handwritten categorization, it is extremely significant to create away how information or data are represent in images. The information at this point is not the pixels row, but the image features have high intensity representation. The E-evaluation is an innovative idea within the playing field of didactics in which the aim is towards enables automatic evaluation of the exam papers with support of computer recognition system and artificial intelligence, particularly OCR and image perceptive. E-evaluation software that a system enables the automatic evaluation of handwritten examination answer scripts through the examiner upon a computer monitor relatively than analysis of paper document. The e-evaluation system is enhanced for the examination session, since it perform segmentation though the answer scripts into an individual task, and distributes task to the certain examiners, specific in the domain which evaluate the task and then send to the Examination panel and also verify the assessment, gather the statistics and the evaluation result.

The computer aid evaluation is an easy task. In form of electronic it simply compares the result to key answers. The scanned answer scripts are processed to recognize the marks. The automatic evaluation task is difficult because of the proper set of solutions would be infinite. The inaccurate answer would be graded with fewer score. The problems may occur during mathematical formula, for this pattern recognition technique is used. The mathematical formula/expression recognition works by individual symbol detection and structural analysis though image segmentation and pattern recognition. And the standard approach acknowledged from OCR for recognition.

II. RELATED WORK

Character recognition is a theme of exhaustive analysis for an extended time period. Whereas the printed text recognition is considered mostly as a solved problem today, handwritten text recognition remains a difficult task because of elevated variability in different people handwriting [5].The system for identifying text though answer scripts and also evaluate marks intended for every small answer on the base of acquired knowledge besides a model. OCR tool is use to take out the handwritten text, where NLP and neural network used for extraction of

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keywords though human evaluation dataset samples of answer paper and keys. The system also evaluates the score based upon similarity measure of sentences. The dataset contains answer and the evaluated mark [1].The evaluation method to calculate the score for every answer which is written by the students, anywhere the appliance are trained based upon datasets. Intended for each answer creature entered was significant to recompense point base taking place the practice of word and the importance. The evaluation will perform though the approach by means of Kaggle dataset or Kaggle Short Answer dataset [2].

In [3] the training and processing of exam answer scripts of individual person to attain the evaluations of answer script by machine learning technique through the assist of back propagation algorithms and neural network. Machine learning technique of introduce computing to the system wherever the system start to find out because it work and therefore become a set of reasonable over the time. By means of assist though neural network many neurons would build that have more information and logics that needed for the system. The algorithm of back propagation increases the efficiency of neurons. Neural network used towards scanning and make sure the checking of the examination papers of individual student and evaluate the answers based on the data fed into the system. Back propagation would track answer beside student for similar answers and exclude some errors incurred though the system during the process of evaluation.

The Handwritten Short Answer analysis System is an automatic small answer analysis system that capable of identify the text in answer scripts and evaluate mark for every small answers supported earlier information acquire besides model. Within the system, Optical Character Recognition tool are accustomed extract the written texts. Natural language process is employed to take out keywords as of human evaluate model dataset of written answer key and answer paper. The projected models evaluate scores supported circular function sentence similarity measure [4]. OCR used towards change of scanned paper into text and it can be edited. The converted document using OCR occupies not as much of space than the image. The NLP used for sentence to confirm the semantic formation. Ontology will match words with keywords in the paragraph based on the matching evaluation will be performed [5]. In [6] Evaluation technique for subjective answer proposed algorithm performs Tokenizing vocabulary and sentence, Chunking, Part of words tagging, Lemmatizing word, Chinking and Word netting toward assessment of individual answer and also it provides the semantic connotation of context. This System divided by main two modules. The module one is data extraction from the image which is scanned and organizing the data in an appropriate manner extracting and the module two is applying NLP and Machine Learning towards the text retrieval and to provide marks.

The digit recognition is classification difficulty, the hypothesis firstly compare classification result of numerous algorithm though machine learning upon MNIST dataset, and subsequently select the convolution neural network through the maximum recognition accurateness rate intended for method implementation. at last, the method on behalf of correcting exam papers is achieve all the way through image uploading, image transformation, image acquisition, digit pre-processing, classification though convolution neural network and the answer comparison score. The convolutional neural network is applied towards written digit recognition for feature extraction deformations although native field and pooling [7].

[8] Presents software frame with the aim of assist teachers during correction task related to mathematical exercises with some degrees of mathematical contents. This system designed a particular workflow and position of convention to facilitate will automatically analyze the student assignments and also check whether they enclose rational mathematical in sequence associated to exact fields. The set of tools would also take into relation corresponding expressions. Within the order towards the check for coherence, extremely configurable and without problems and the teacher designed editable content-checking rules which submitted near correction mechanism.

Detects the flaw and information gaps by identifying central part concepts the gaps are detected. Where the flaws are identified besides the segmenting process, aligning and the student answer analysis task [9]. The ontology of graphemes aims a character recognition technique which expressed throughout the formation of ontology so as to represents the contented text or document written automatically or manually. This ontology would transform the picture-version of text into a representation of spatial relationships and concepts. This paper presents typographical depiction of processed and analyzed document or text by representing ontology by the set of concept which represents the grapheme of the character by denoting the position or the document towards localization [10]. To extract specific space of the task the bitmaps are used to process and also the analysis task is performed with the support of image process and also the analysis.

III. PROPOSED SYSTEM

To overcome the limitations of existing system, the proposed system aim is to build software for evaluating the handwritten mathematical examination papers and the theoretical papers automatically. In this system, the handwritten examination papers are scanned and converted into an editable format using OCR tool and then evaluation will be performed by formulas, in-between steps and final solution for the numerical papers, for the theory papers the evaluation will be performed by the keywords or synonym based keywords which are maintained in the database. Finally the marks will be given depend upon the identical key terms.

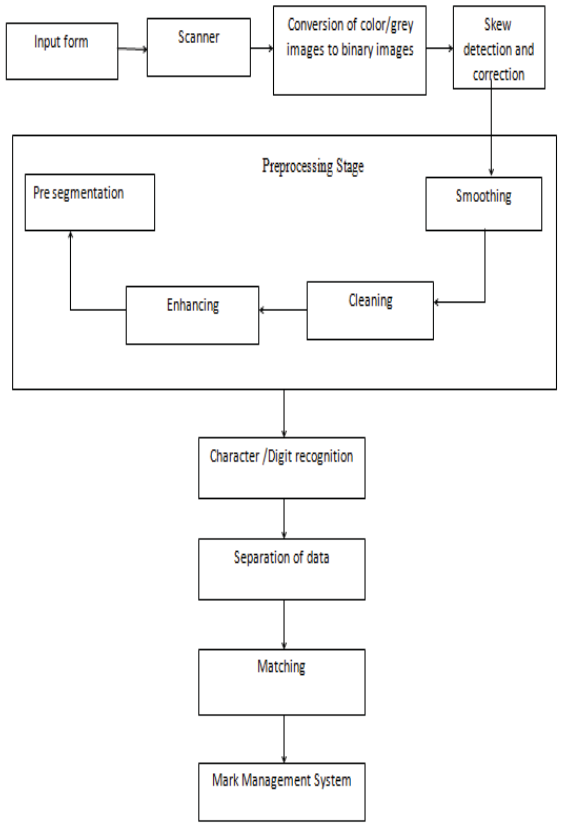

Fig.3.1 System Architecture

A. OCR Tool:

Optical Character Recognition tool that permits to convert the dissimilar types of scanned paper documents, captured images by digital camera upon an editable form or PDF files

In order to repurpose and extract data from camera images, scanned documents or PDFs, the OCR software would particular exposed letters on image and locates them into words then words to sentences by enable to edit and access the original document content.

B. Binarization

Binarization converts a picture from grayscale or color keen on black along with white known as a "binary image" as present is two colors. It also converts the acquire form of image into binary format, inside which foreground contain symbol, filled data, frame line and printed entities.

C. Scanning

Towards the model selection for system process a figure recognition step match the features which extracted from an incoming figure next to where the extraction from each design of a module

D. Image extraction

The extraction from relevant data though particular field and preprocesses the information in order to enhance data and eliminate noise. The characters are recognized by the extraction of field is nearby subsequent to the present analysis.

E. Pre-processing Stage

Pre-processing step involves RGB to grayscale image alteration, noise removal, Thresholding etc. In RGB to grayscale picture conversion, RGB image is converted to gray image. Thresholding converts gray to black and white image. If needed the key document could be resized if needed. This image pre-processing step has immense impact on quality of OCR process.

F. Smoothing

Smoothing operations are used for noise decrease and for blurring in color images. Blurring used inside the preprocessing stage for as removal of undersized details from image. Smoothing operations reduce the noise in binary image.

G. Cleaning

Cleaning is done for the separation and removal of preprinted entity whereas the preserving of filled data by resources of image-processing technique. The appearance of summarize information commencing the knowledge base for the utilization of cleaning procedure.

H. Enhancing

It reconstructs the stroke that has been detached throughout cleaning process. Over the baseline if some filled data is printed then in cleaning it also remove the foremost discontinuity in character which might obstruct the recognition.

I. Character Recognition

Recognition is to map the given pattern with internally stored database. The matching though the recognition process is presented by the gesture with the standard indication. The important features like the size, depth, shape, color are extracted from the recognition system by input image. If the geometrical features are extract as of input after that the character

is able to be coordinated by means of normal characters within the library.

Thinning process will remove the pixels consequently the object with no holes shrink toward a minimally associated stroke. Skeletons are useful for describing properties of a shape and also in various cases it used intended for transformation of the original shape.

IV. METHODOLOGY

The modules of the proposed work mainly focus on conversion part, whereas handwritten recognition remains a challenging one while compare toward further assessment process. The proposed system for automatic exam paper correction is build till now the extraction. It contains the following:

1) Student Login: The student login created for the students to view their individual results. The students are able to view results by the valid register number and the password also they can view the marks scored for particular answer.

2) Admin login: Admin login will be controlled by the administration. This will set by entering the abuser given name and code word. Here the Admin be able to edit or create examination paper patterns. The evaluation will perform by the administration though the keys which maintained in the database. They will perform the evaluation by extract summary, extract calculation and report detail for both the theoretical and numerical papers.

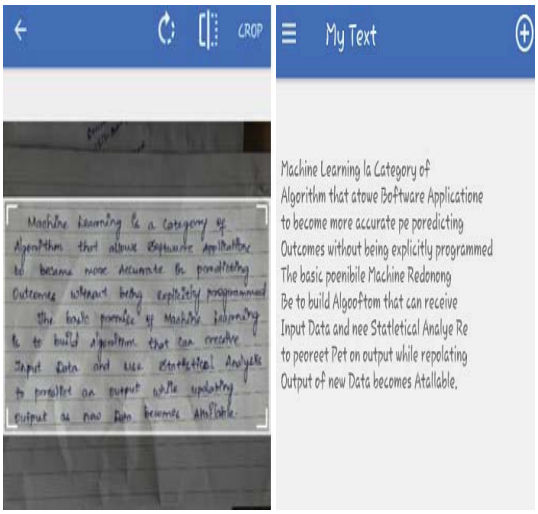

Fig.4.1 Conversion of Handwritten notes to Text

Fig.4.1 shows the Conversion of Handwritten notes to Text from the uploaded image

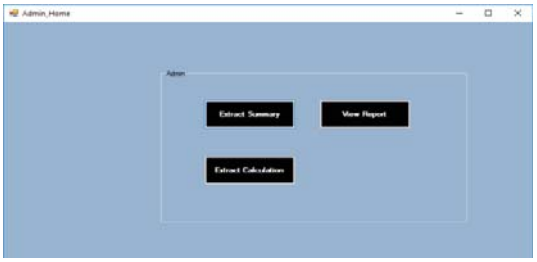

Fig.4.2 Admin Home page

Fig.4.2 shows the admin home page of extraction part by entering the user name and password.

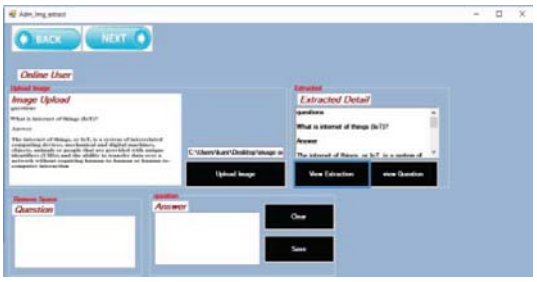

Fig.4.3 Summary Extraction

Fig.4.3 shows the summary extraction from the uploaded image.

Fig.4.4 Calculation Extraction

Fig.4.4 shows the calculation extraction from the uploaded image

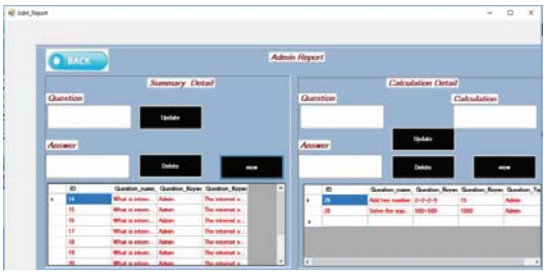

Fig.4.5 Admin Report

Fig.4.5 shows the Admin Report and the reports can be updated or deleted.

Fig.4.5 Matching Page

Fig.4.5 shows the matching process of extracted text from the image.

The proposed work is completed till this, the system also provide grade depend upon the mark which scored by the individual student. Here the marks will be awarded by matching key terms which maintained in the database and the results of the students are automatically stored into the database.

Correction Mode	Accuracy	Error Rate	Time
Manual paper correction	> 80%	< 20%	> 4 min
Automatic paper correction	> 98%	< 2%	< 1 min

Table.1.1 Performance Metrics

V. CONCLUSION

Technology enrichment within constituent component hardware and software technology, assessment pattern has spectacularly changed as of class base exam to an online assessment. Online automated examinations do not just implement while preset examination and assessment process although provide reliable and quick appraisal with more flexibility for computerization of whole assessment process. These techniques would encompass their individual advantages consequently the dissimilar type of automatic evaluation is important. Finally the paper is finished with most recent improved functioning of automatic evaluation process. Use of computer have significantly increased in education learning practice and approximately each pasture of education as well extensively use for conduct, evaluate and display consequence of such assessment. Development and effectiveness can exist obtain more time towards the most recent needs, thus the system is easier and more accurate.

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