

Automation Framework Based on Artificial Intelligence for the Evaluation of Academic Credentials

Kushal¹, Aryan Sharma², Kiriten³, Aditya Kumar⁴

¹Chitkara Institute of Engineering and Technology, Chitkara University, Rajpura, India

Abstract

In today's fast-changing world, students and professionals are moving across international borders much more often. Since many people want to go to school, get a job, or improve their skills abroad, there is a big need for reliable systems to check academic credentials. Employers, schools, and immigration officials must look at international credentials and see how they compare to local educational standards. This process makes it much more fair to choose who gets into school, who gets a job, and who gets a visa. One of the biggest problems with evaluating academic credentials is that different countries have different ways of grading and organising their schools. There are several approaches applied by countries in the evaluation of the educational attainments of the students. They include credit-based assessment, alphabetical assessment, percentage-based assessment, and Grade Point Average (GPA) system of evaluation.

Different ways of designing the curriculum, the length of the course, and the school's accreditation make the review process even harder. To assess these differences, manual evaluation requires expert judgement, introducing subjectivity that may yield inconsistent results. Also, as the number of global applications grows, manual processes become less effective and harder to scale, which leads to delays and higher costs of doing business.

On the contrary, most existing approaches for assessing the academic credentials of students are manual and require a significant amount of labor resources. One should consider the transcript of studies, assess the grading scale, evaluate the credibility of the institution, and examine the course outline. Such an approach implies a large volume of work and lacks accuracy because each country has its own unique educational system. The process of reviewing becomes complicated due to the presence of various scales for evaluating academic achievements, including percentage, GPA, and alphabetical. Moreover, it is difficult to conduct a comparative analysis since courses differ in their length, curriculum design, and certification criteria.

As the number of global applications grows, manual processes are becoming less effective and harder to manage. Clearly, we need a system that can better handle these problems. This study proposes an AI-based automation system that simplifies and improves the process of reviewing certifications. The system uses optical character recognition (OCR) to get data from academic papers, and then it uses machine learning algorithms to look at and understand the data. A rule-based mapping technique is also used to match the data with set equivalency requirements.

This system will be able to produce the same output repeatedly, increasing its level of accuracy while reducing manual labor. In addition, scalability will allow the processing of many applications

simultaneously. This structure offers an effective and modern tool for improving credential evaluation systems.

Keywords: Automation, Machine Learning, Artificial Intelligence, Credential Evaluation, and Educational Equivalency

I. INTRODUCTION

Globalisation has had a big effect on education and jobs, and it has also made it easier for people to move to other countries. Professionals often look for better job opportunities in other places, while students often move to other countries to get a higher education. Because of this, it has become very important to check the academic credentials of people from other countries. Universities, businesses, and immigration agencies use credential evaluation to make sure that applicants meet the academic standards.

Evaluating credentials can be quite challenging due to their importance. The education systems of various countries are very different from each other. Several rating systems exist such as letter grading system, GPA system, and percentage system. Even curriculum systems, class durations, and credits systems differ. For example, a bachelor's program that runs for three years may not be considered equal to a program that lasts four years in another country.

Evaluation processes are largely done manually by experts at present. Transcripts are analyzed carefully, trends in grading are studied, and comparison of course information takes place. Although this procedure involves detailed evaluations, it is time-consuming and laborious. Moreover, in certain cases, it is possible that different results would be obtained depending on the knowledge possessed by the evaluator of the different education systems.

Manually done tests have been found to be inadequate due to the increase in foreign students. Time consuming nature has led to many problems including inefficiency. Consequently, there is a need for a better system.

The process of the method could be completely transformed using artificial intelligence. Machine learning algorithms can detect patterns and help with making decisions, while other technologies such as OCR can automatically retrieve information from written documents. However, many of today's technologies only focus on specific elements of the process, like data analysis.

The research highlights an integrated methodology involving rule-based mapping, machine learning, and OCR. The objective is to reduce human effort, ensure consistency, and automate the entire assessment process. The solution is designed to handle different academic transcripts and provide precise equivalency results.

II. LITERATURE REVIEW

There have been extensive studies conducted on how AI and document-processing technologies could be used to automate hard tasks. These technologies could play a huge role in the assessment of academic credentials that require an analysis of educational information from multiple systems.

One of the most widespread uses of OCR technology is text extraction from images of printed documents. Earlier versions of OCR software were not very accurate, especially in dealing with complex layouts, and were dependent on simple rules-based algorithms. The efficiency and reliability of modern OCR software have been greatly improved due to advances in deep learning technology. As an example, the work by Wang et al. [3] describes how text recognition approaches have evolved. Similarly, Fleischhacker [4]

highlighted issues related to processing complex document layouts, including noise interference and changes in layout.

Moreover, the efficiency of AI-based OCR solutions in improving the quality of documents has been established recently. In fact, OCR along with artificial intelligence techniques can increase efficiency and effectiveness, which has been proven by Usama [5] and IJIRSET [6]. Beyene et al. [9] and Memon et al. [10], moreover, examined advanced OCR systems that were able to work with both handwritten and structured text.

Machine learning has also found wide applicability in educational data analysis. In their study, Kumar and Singh [12] investigated the use of machine learning techniques for analyzing academic performance and mining patterns from student data. Lee [13] also explored the application of artificial intelligence in improving evaluation methods. Yu et al. [8] presented a framework that integrates NLP with machine learning to derive structured information from unstructured data sources.

In addition to OCR and machine learning, other automation techniques have also been considered for improving document processing systems. In order to make the credential verification system more secure and transparent, Arif et al. [1] introduced a framework incorporating AI, blockchain, and robotic process automation. Document processing systems utilizing AI for data extraction and analysis were discussed by Kolandaisamy et al. [2]. Importance of automation in achieving greater scalability and reliability in educational data processing was discussed by Zhao et al. [15]. Role of OCR technology in document extraction tasks was discussed by Brown [14].

Even with the above progress, most of the existing literature focuses on the individual aspects only without providing a solution to the problem comprehensively. Machine learning models are concerned with prediction while OCR systems are more involved in data capture. There is little existing research that integrates all three of these techniques to assess academic qualifications.

In this respect, this study attempts to fill this gap by providing an effective framework in which different technologies can be incorporated for an efficient, scalable, and consistent review process.

III. METHODOLOGY

The recommended method involves automation in the evaluation process for academic qualifications based on the following steps:

Step 1: Academic Record Upload

The users are required to upload their academic qualifications in digital format, such as in PDF files and photos.

Step 2: OCR Processing

The important data is then processed by the system through the OCR process. Student data, names of the topics, grades, number of credits, and institution data are all part of the data.

Step 3: Data Preprocessing

This step involves cleaning and standardizing the data that was obtained in the previous step. It involves correcting errors, rectifying inconsistencies, and consolidating multiple types of grading formats to one standardized format.

Step 4: Machine Learning Analysis

In order to discover trends in academic performance, credits, and grading systems, machine learning techniques analyse the cleaned data. With time, the model becomes more accurate by using the previous data.

Step 5: Equivalency Mapping

The cleaned data is matched against preset equivalency rules through a rule-based approach. This helps classify degrees into categories based on preset criteria and gives appropriate grades.

- GPA scaling (e.g., 10-point -> 4-point system)

Step 6: Report Generation

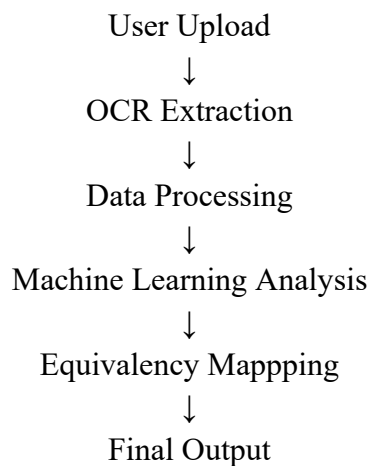
Finally, an assessment report is generated from the system. The report highlights the summary of academic achievement, equivalency of degree, and GPA conversion.

IV. SYSTEM DESIGN

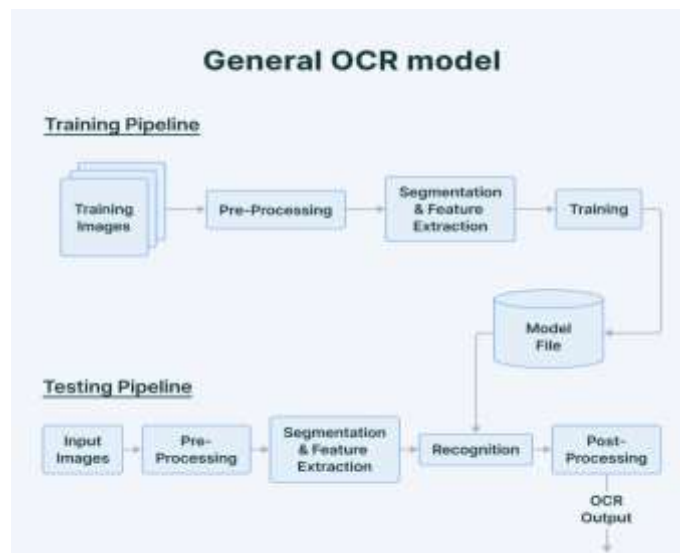
Components of Architecture:

- Input Module
- OCR Engine
- Data Processing Module
- Machine Learning Algorithm
- Equivalency Database
- Output Module

Workflow:



This modular architecture ensures that the system is scalable, flexible, and easy to maintain.



RESULTS AND ANALYSIS

When compared to conventional manual evaluation techniques, the suggested solution offers the following benefits:

- Shortened time of processing is among the most significant benefits of the system. Automation allows for a faster completion of operations that would otherwise require several hours or even days.
- The tool also ensures consistency in evaluations. It is because the process is governed by pre-existing guidelines, which ensure that any discrepancies caused by human error are minimized.
- Human errors are minimized through automation. Errors in the analysis of data may be attributed to human mistakes, such as misinterpretation or incorrect entry. The automation process ensures that such occurrences are minimized.
- The tool is highly scalable. Therefore, it will allow for efficient processing of large numbers of applications. Such institutions will benefit from the automated application process.

Parameter	Manual System	Proposed System
Time	High	Low
Accuracy	Medium	High
Scalability	Low	High

Although the system is currently conceptual, the results show great potential for practical use.

CONCLUSION & FUTURE SCOPE

An AI-based methodology for automating the assessment of academic credentials is presented in this study. Many of the drawbacks of conventional manual approaches, such as inefficiency, inconsistency, and lack of scalability, are addressed by the suggested solution.

The technology provides a better means for evaluating academic credentials because it combines optical character recognition, machine learning, and rule-based mappings. The process ensures uniformity, enhances accuracy, and reduces the labor component.

Future Scope

- With current data sets about global education
- By employing deep learning techniques to improve accuracy
- By utilizing blockchain technology for verification purposes
- By creating an online portal

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