

Student Mentoring System Using Robotics Process Automation in Engineering Education

Prof. Satheesh Chandra Reddy S, Akash DR, Akash R, Kavya D, Lavanya A
S J C Institute of Technology, Chickballapur, Karnataka, India

Abstract: Robotic Process Automation (RPA) is the technology of software robots programmed to perform some of our daily tasks. They are often used to perform time-consuming and routine tasks. This allows employees to complete the right task as well as reduce their workload. Today, the rise of artificial intelligence (AI), robotics and other technologies has created new business needs with digital transformation. Education schools should embrace this technology to help develop digital skills and should help students lead a positive and creative digital life. Recently, study was prepared to prove the change in Robotic Process Automation (RPA) technology. RPA provides a pathway to digital transformation for 4,444 traditional companies. aims to eliminate inefficiency and human resources in daily work. RPA directly or indirectly helps teachers, educators, students and parents. This solution has changed the training process based on short candidate selection, reducing working hours, automating attendance and making sense of everything and improving management. The aim of this project is to teach RPA in education and to present the RPA model for intelligent learning. RPA can help with this by saving capital and, an important tier for schools.

Keywords: RPA, Student Proctor, Automation.

I. INTRODUCTION

Education is a challenging sector to automate due to the importance of social interaction and individualized learning. However, the adoption of e-learning and smart education has increased with the availability of technology and high-speed internet. Automation can improve educational content, policies, and strategies but cannot solve every issue in the global education system. Artificial intelligence and machine learning technology can improve student engagement, grading, and data management. Robotic Process Automation (RPA) is a subset of business process automation that can help teachers, administrative staff, students, and parents by eliminating inefficiencies and creating a virtual workforce. RPA is an essential part of where machine learning is headed in the education industry, aiding students in grasping concepts and ultimately leading to better grades and applicable skills in the real world. The education sector must embrace new learning styles and technologies to evolve and maintain the integrity of knowledge. The proposed RPA model is a reliable and efficient way to improve smart education.

II. LITERATURE SURVEY

"Smart Education: A Review and Future Research Directions" by Adrián Carruana Martín, Carlos Alario-Hoyos. "Smart Education" is a buzzword that represents a move towards more technology-enhanced learning. Technologies such as adaptive learning systems, personalized learning environments, learning analytics, and augmented and virtual reality are part of this movement. These technologies aim to create tailored and engaging learning experiences for students. The promise of "Smart Education" is improved student engagement, better learning outcomes, and better workforce preparation. However, caution is needed to ensure that technology does not replace human interaction in the learning process.

"Machine Learning in Educational Technology" by Ibtehal Talal Nafea. Machine learning is a branch of artificial intelligence that enables computers to learn from data and make intelligent decisions. In education, machine learning can be used to save teachers time in their non-classroom activities by utilizing virtual assistants.

These assistants can improve the learning experience for students and help improve progression and achievement. Machine learning also supports personalized learning by enabling teachers to create customized curricula tailored to

individual student needs. AI advances also enable teachers to gain insight into student progress and provide intelligence moderation. This platform allows for the analysis of data by human tutors and moderators to support student learning. Smart Boards are becoming increasingly popular in classrooms across the country due to the many benefits they provide to both teachers and students. This technology enhances the learning experience by providing visual elements and accommodating different learning styles. Visual learners can benefit from observing the whiteboard, while tactile learners can benefit from touching it. The touchscreen feature enables teachers to easily navigate through programs and makes it simple for students to follow along. With Smart Boards, differentiated learning is made easier and students can receive an enriched learning experience.

III. PROBLEM STATEMENT

Automating education is challenging because it involves more than simply transferring information from teachers to students. Effective education requires social interaction and personalized adaptation to meet individual student needs and capabilities. Human interactions play a critical role in education and cannot be fully automated. However, the rise of smartphones and smart gadgets, as well as the availability of high-speed internet, have contributed to the growth of smart education.

IV. EXISTING SYSTEM

There are several existing solutions that utilize technology to enhance education while still maintaining human interaction. Some examples include:

1. Learning management systems (LMS) that provide a platform for teachers and students to interact and manage course content online.
2. Personalized learning environments that use adaptive learning algorithms to create customized learning experiences for individual students.
3. Gamification of learning, which uses game-like elements to engage students and make learning more fun and interactive.
4. Learning analytics tools that collect and analyze data to provide insights into student progress and learning patterns.
5. Virtual and augmented reality technology that enables students to explore subjects in an immersive and interactive way.

These solutions are just a few examples of how technology can be used to enhance education while still maintaining human interaction and personalization.

V. PROPOSED SYSTEM

The proposed system will be a web-based platform that leverages RPA to automate administrative tasks such as attendance tracking, grading, and student performance analysis. The system will also incorporate smart education technologies such as personalized learning, adaptive assessments, and virtual classrooms to provide an engaging and effective learning experience for students.

VI. OBJECTIVES

Introduce RPA into the education system and propose an RPA model for the smart education system. Implement an automated student attendance system to remove the need for manual attendance taking. Implement a shortlisting system for student interviews. Reduce the workload of staff by automating non-academic tasks.

VII. METHODOLOGY

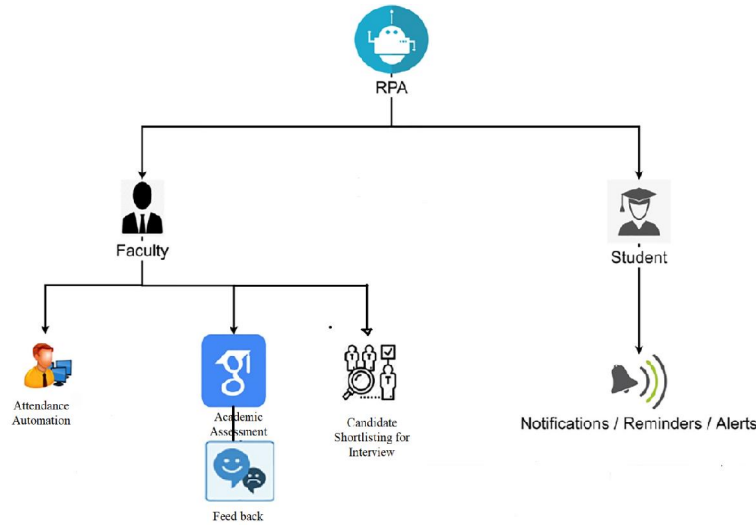


Figure 1: System Architecture

In this project, we aim to automate the attendance process using CNN and Local Binary Patterns (LBP) face recognition techniques. Additionally, for the automation of shortlisting students and academic analysis, we will utilize a mathematical model. In this project, our focus is on face detection using an algorithm that requires positive images (images of faces) and negative images (images without faces) for training the classifier. We extract features using CNN, which are similar to convolutional kernels. Each feature is a single value obtained by subtracting the sum of pixels under a white rectangle from the sum of pixels under a black rectangle. To calculate plenty of features, all possible sizes and locations of each kernel are used. This process requires significant computation, with even a 24x24 window resulting in over 160000 features. For each feature calculation, we need to find the sum of pixels under white and black rectangles, which is simplified through the use of integral images. This technique involves an operation involving just four pixels, no matter the number of pixels, making the process super-fast.

VIII.CONCLUSION

The student mentoring system using robotics process automation (RPA) in engineering education has emerged as a promising solution to enhance the quality of education for engineering students. The system leverages RPA technology to automate various administrative and academic tasks, which can allow mentors to focus more on providing personalized support to students. By implementing the system, the students can receive consistent and objective feedback, identify areas of improvement, and personalize their learning plans. The mentors, on the other hand, can be relieved of administrative tasks, focus on high-value tasks, and provide more efficient [1]. Adrián Carruana Martín, Carlos Alario-Hoyos, Carlos Delgado Kloos, (2019). Proceedings Smart Education: A Review and Future Research Directions.

IX.FUTURE SCOPE

Robotic Process Automation (RPA) has the potential to bring significant benefits to the education sector by automating repetitive tasks and reducing administrative workload. RPA can automate tasks such as attendance management, grading, and data entry, allowing educators to focus on more important tasks such as providing personalized education and engaging with students. With RPA, educational institutions can optimize their processes, increase efficiency, and reduce costs. In addition, RPA can help create a more interactive and engaging learning experience for students by providing them with personalized feedback and support. With the advancements in RPA technology, we can expect to see more widespread adoption of RPA in the education sector, leading to more efficient and effective educational processes, better learning outcomes, and improved student satisfaction.

REFERENCES

- [1] Adrián Carruana Martín, Carlos Alario-Hoyos, Carlos Delgado Kloos, (2019). Proceedings Smart Education: A Review and Future Research Directions.
- [2] Alcatel-Lucent, (2019). Why Digital Transformation for Education? <https://www.al-enterprise.com/>
- [3] DorAlmog, YuliaBezobrazova, Vita Zlotova, Gidon Kadosh, (2020). Robotic Automation Automation, Total Cost of Automation, White Paper, Kryon. <https://www.kryonsystems.com/>
- [4] Çano, Erion. (2017). Hybrid Recommender Systems: A Systematic Literature Review. Intelligent Data Analysis. 21. 1487-1524. 10.3233/IDA-163209.
- [5] DanielFaggella,(2019).ProcessAutomation, Examples of Artificial Intelligence in Education.
- [6] Choudhury, T., & Mitra, S. (2021). Implementation of Robotics Process Automation in Educational Sector: A Review. International Journal of Advanced Science and Technology, 30(5), 3427-3433.
- [7] Cho, Y., & Lee, J. (2020). Design and implementation of a personalized learning system using robotics process automation in higher education. Sustainability, 12(20), 8616.
- [8] Garg, P., & Choudhary, P. (2020). Robotics process automation in education: A review. International Journal of Emerging Trends in Engineering Research, 8(10), 3184- 3189.
- [9] Huang, X., & Li, Y. (2021). Applying Robotics Process Automation to Enhance the Teaching Quality of Online Engineering Education. Journal of Educational Technology Development and Exchange, 14(1), 1-18.
- [10] Hu, W., & Xu, X. (2020). The Application of Robotics Process Automation Technology in Education Management. Journal of Physics: Conference Series, 1666(1), 012001.