Attendance Management System using RPA

1st Himanshi Prajapati
Dept. Electronics and Telecommunication
Ramrao Adik Institute of Technology
Nerul, India

2nd Akshata Rane
Dept. Electronics and Telecommunication
Ramrao Adik Institute of Technology
Nerul, India

3rd Kavita Vanve
Dept. Electronics and Telecommunication
Ramrao Adik Institute of Technology
Nerul, India

4th Asst.Prof Mrs. Amruta Chintawar
Dept. Electronics and Telecommunication
Ramrao Adik Institute of Technology
Nerul, India

***Abstract*—Earlier we could differentiate humans from machines on the basis of the ability to make decis io ns and out of the box thinking, but this is no longer true in today's world. The increasing use of Automation and Artificial Intelligence has been able to change our lives completely. Robotic Process Automation is a technology that allows people to configure and program a robot that can do work like screen scraping, process information, data scraping, and sending and receiving data from various systems without any human intervention. RPA finds its ideal application in industries like education, banking, finance, insurance, healthcare, and marketing. In the education industry, attendance is always synchronized with 'paper' and 'pen'. There is a strong need to have a fool-proof, secured, and an automated monitoring system, which fills in for the repetitive burdensome activities of teaching and non- teaching staff, and increase the overall productivity of the management. This system, which will replace the time-consuming old method, will save time, reduce the amount of work the teachers have to do, and will replace the stationery material with a computer-based system. This system is in charge of keeping track of the student's attendance records. It calculates a student's attendance basedon their presence in class. It is kept up on a daily basis by their attendance. This project aims to provide a detailed study of RPA with an example of its application in the Education sector by designing an Attendance Management System that reduces the burden and increases staff productivity.**

Index Terms- Robotic Process Automation, Attendance Management System, Smart Education.

I. INTRODUCTION

Monitoring attendance is a tedious but necessary task that educational institutions must perform on a daily basis. And if you believe that institutions must only be concerned with student attendance, you are mistaken. Accurate time reviews of faculties and school administration are also very important to offer fair compensation. It is critical to keep track of the time that educational stakeholders are using productively, which manual time registration does not allow for.

In the current system, attendance is always viewed as a manual task that necessitates the use of copious amounts of paper and pens to keep track of all students. To this day, India has a tradition of manually taking attendance. Only a few offices or corporates have started using the biometric attendance system. But the problem arises is that data has to treated by an employee to determine the right compensation for every employee, which again is a tedious task to perform. The intention of developing an Attendance Management System is to computerize the traditional way of taking attendance.

The Attendance Management System (AMS) is a platform for tracking daily student attendance in schools, colleges, and universities. It makes it easier to access a specific student's attendance information in a specific class. It also eliminates the need for proxy attendance. Within a short period of time, data accuracy is maintained. Because attendance is kept in registers, it is difficult to manage, track, and update the data. Having a backup is also challenging in this method.

Therefore implementing the right attendance system becomes important for not just in school or colleges application but in all offices and institutions around the globe for the paperless attendance procedures. The RPA tool will be well-trained with pertinent information on how to determine the appropriate compensation for each employee in exchange for all of their work for the institution.

There is still a lot of advancement that can be done using the latest advancement in the technologies, RPA(Robotic Process Automation) is one such technology that can be implemented to validate records by cross-checking data and give alert when information is missing or inconsistent so that disruptions are avoided

and workforce can be managed efficiently[1][2].

II. LITERATURE SURVEY AND RELATED WORKS

In this section, we will go over the background information needed to establish a foundation for our research. This includes the importance of automation in education, digital transformation, and emerging technologies for automating educational processes.

A. Automation in Education

Educational institutions bear a significant amount of responsibility for educating the next generation. Schools and colleges have already begun to implement new technologies such as smart boards, online classrooms, school or college websites, and an online submission portal [3].However, when it comes to teacher workload, nothing has changed. Doing the same tedious and repetitive task every day. Scheduling academic meetings, tracking daily attendance, managing student recruitment and enrollment, planning educational events, and processing invoices are just a few examples. Education, in particular, is ripe for automation, according to Neil Kinson [4]. The impact of automation in education will continue to improve how staff and faculty work and how students engage and learn. Once fully operational, faculty will be able to use automation to take the busy work out of their jobs, freeing up time in the classroom for meaningful student interactions [5].

B. Transforming Digitally:

As the educational sector grows increasingly competitive, digitalization is becoming a necessity for survival, as this new digital world necessitates educators adapting and adopting digital technologies, methodologies, and mindsets. According to Alcatel Lucent [6], "Digitalization is a physical and intellectual change intended to meet the ever-increasing demands of students, faculty, and campus in order to create a learning experience. This is an ecosystem that combines technology, services, and security in order to bridge the digital divide and provide collaborative, interactive, and personalized learning experiences."

C. Modern Technologies used in Education Sector:

AI, ML, IoT, and Big Data are examples of recent techno- logical advancements. These technologies have the potential to put an end to the previously mentioned inefficient education system. In today's cocooned world of education, students and teachers are constantly adopting different ways of learning and absorbing information to improve their learning experiences, and AI is increasingly being used. AI tools and Chatbots have now become a game changer in the rapidly evolving EdTech world. Some of the ways ML is reshaping education, ac- cording to Karl Utermohlen [7], are more personalized learning experiences, predicting career paths, less bias in grading, and convene a meeting. According to Ibtehal Talal Nafea [8], ML can be used to review a difficult-to-understand lesson. ML in education works in conjunction with students' needs, and at a time and place that is convenient for them. The Internet of Things improves education by adding advanced value to structures and the environment. According to Savaram Ravindra [9], a smart education institution (using IoT technology) with smooth operations promotes a higher level of personalized learning. For receiving instructions and sending data, smart devices on site use cellular networks / Wi-Fi networks. An IoT system for an educational institution aids in the tracking of major resources, the development of smarter lesson plans, the design of secure campuses, the enhancement of information access, and much more. The primary goal of using Big Data in applications is to visualize data and provide predictive analysis based on the data visualization. It has the ability to harvest the information or knowledge embedded in massive amounts of data, providing the foundation for human socio - economic activities, and improving operational efficiency.

D. Role of RPA in Education:

With so many technological advancements, there are areas that are still replete with manual work that would be ideal for robotic systems that can consistently perform these repetitive and tedious tasks without actual human involvement. Robotic Process Automation (RPA) automates tasks by utilizing soft- ware robots capable of using Artificial Intelligence, Machine Learning, and other advanced technologies. They carry out tasks just like a full-time employee and, at times, collaborate with humans to complete various types of assignments.

III. PROPOSED SOLUTION

Robotic process automation (RPA) is the use of software with Artificial Intelligence (AI) and machine learning capabilities to handle high-volume, repeatable tasks that previously required humans to perform. These tasks can include queries, calculations and maintenance of records and transactions. Robotic Process Automation is carried out through the execution of a set of workflow tasks. It gives the software bots instructions on what to do at each stage. Once this workflow has been programmed into the RPA, the software can run the program automatically and complete the desired task multiple times as needed. The 'automated creation of invoices' is one of the most common RPA examples. It

is an important function for any business, but it can also be a punishing task at times. Because human employees must deal with or modify hundreds or thousands of such tasks every day, this task is usually monotonous and time-consuming.

RPA can be used in conjunction with existing IT infrastructure; all that is required is training on how to use it. For businesses that rely on legacy systems, this is a significant benefit. It connects to front-end infrastructure and employs the same graphical user interface (GUI) that human workers would use to complete a task, ensuring that the IT landscape isn't altered to accommodate RPA, lowering costs. We will be using UiPath software for this project. We installed the Community or free version of UiPath. UiPath provides many features and advantages to work with. Some of them are:

- Comprehensive Solution: UiPath Studio, UiPath Orchestrator, and UiPath Robots work together to provide a complete solution.
- Intuitive: Because UiPath employs drag-and-drop and flowchart techniques, working with it and creating robots is a breeze. It's also very simple to learn.
- Large Activity Library: UiPath has a large activity library with hundreds of ready-to-use drag-and-drop actions.
- Security: Because we can store and encrypt credentials on a centralized server, UiPath provides a high level of security.
- Intuitive and Flexible Debugging: UiPath provides its users with a very powerful debugging tool that is both intuitive and flexible.

Attendance management systems are used in the educational and information technology sectors. With the proposed data system, teachers or clients will be able to easily maintain attendance and thus run the entire work of attendance marking in a much smarter, accurate, and error-free manner. Advantages of having this Attendance Management System developed using Robotic Process Automation:

- It is Highly Secure.
- Automated attendance management systems guarantee better time records while reducing the inevitable and costly errors associated with manual data entry.
- It saves money by eliminating inaccuracies in time reporting, buddy punching, absenteeism, tardiness, time abuse, and overpayment.
- Manually monitoring and managing attendance can be time-consuming, labor-intensive, and expensive. Free up valuable administration time by using an automated sys- tem that does everything for you, from tracking employee hours to automatically importing data into your payroll system.
- You can create accurate reports on hours worked, absences, overtime, and obtain a monthly status report for any of the data/groups within the organization.
- An automated attendance management system can help manage schedules, assign work, and easily keep track of shift swaps with just a few clicks.

IV. RESULTS

We developed a software robot using UiPath software. This software robot will take the file path where your excel sheet is stored and read and extract all the data written in it. It will then perform all the calculations like Total Present, Total Absent, Total Working days, Percentage and Feedback. All of this is achieved by using the various activities provided by Uipath software. We used activities like:

- Excel Application Scope - Opens an Excel workbook and sets the scope for Excel Activities. When this activity is completed, the specified workbook and the Excel application are closed.
- Read Range Activity - To read the data from the Excel sheet
- For Each Row Activity - Enables you to step through arrays, lists, data tables or other types of collections, so that you can iterate through the data and process each piece of information individually.
- If activity - this condition is in For Each activity which is for checking condition like if student is Absent, Present. We can assign count here.
- Assign activity - to increment the value of a variable in a loop, sum up the value of two or more variables and assign the result to another variable.
- Output data table - Writes a DataTable to a string using the CSV format.
- Write Range Activity -Writes data from a DataTable variable to a spreadsheet, beginning with the cell specified in the StartingCell field. If no starting cell is specified, data is written beginning with the A1 cell. If the sheet does not exist, a new one that has the value specified in the SheetName property is formed.

Finally, we tested our software robot using our class attendance data and it worked successfully and all the calculations were stored in Sheet2 of our Excel Sheet. All these calculations were done without any human interventions and were accurate.

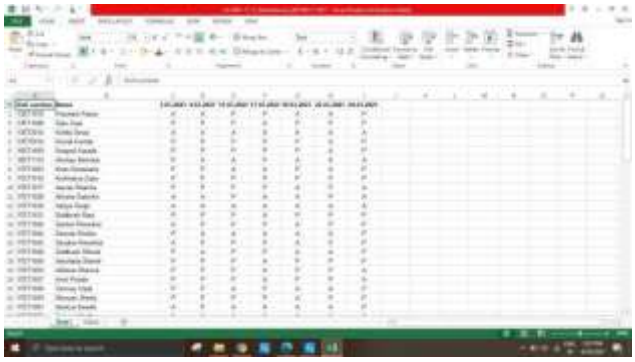

Fig. 1. Input Data

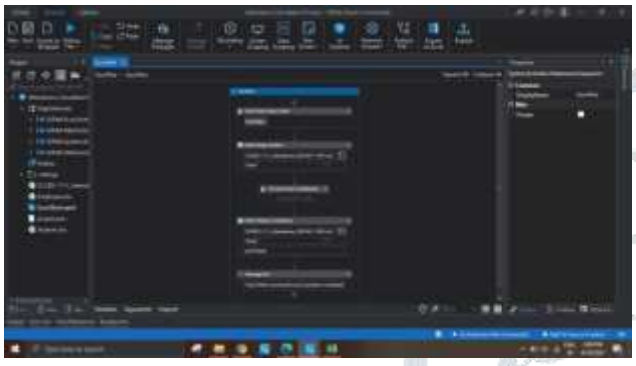

Fig. 2. UiPath Implementation

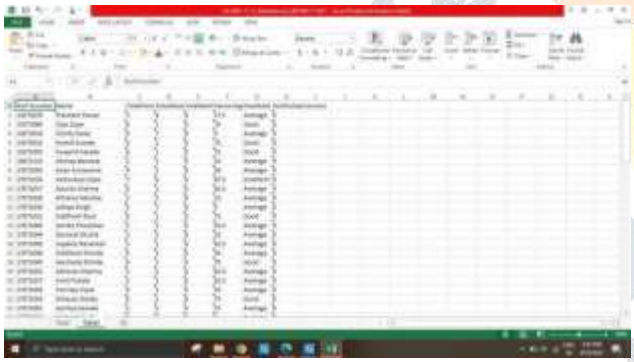

Fig. 3. Output

V. FUTURE SCOPE

RPA has an infinite and vast scope. In Fig.4 it represents that, it is expected that RPA will be the future of IT automation. If someone wants to build a career in RPA, this specific area will automatically expand their career options. One of the prospects is the field of Artificial Intelligence, which may include the innovative level of decision making and job implications. Furthermore, RPA has a bright future in the banking industry, where robots will be used to perform virtually all calculations and transactions. It will also have an impact on other cutting-edge technologies in the area, such as automobile and aircraft manufacturing. It is expected that both traditional and online courses will grow rapidly in the coming years.

Most RPA tools, such as RPA Blue Prism, UiPath, and automation anywhere, are already in use within businesses. The candidate who wishes to pursue a career in the field of RPA can learn any of these tools in order to implement RPA in the future. In the education sector, an automated attendance system can be used.

RPA is no longer limited to task simplification; it can also be combined with AI or machine learning, making it extremely popular for automating complex tasks involving structured or unstructured data, such as supply chain management, payroll processing, or software programming. Furthermore, the benefits of RPA are widely reported, such as reduced errors, improved compliance, and enhanced customer experience at significantly lower costs.

	2019	2020	2021
Revenue	1,411.1	1,579.5	1,888.1
Growth(in percentage)	62.93	11.94	19.53

TABLE I
Worldwide RPA Software Revenue (Millions of U.S Dollars)

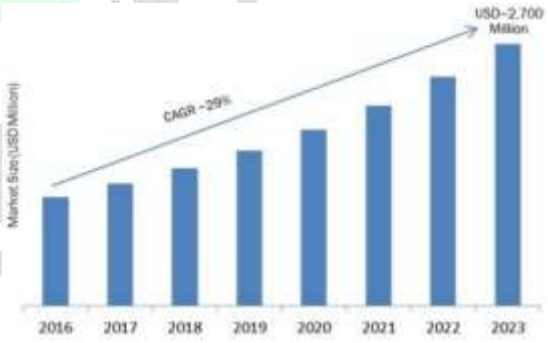

Fig. 4. Growth Graph of RPA

VI. CONCLUSION

Robotic Process Automation (RPA) provides advanced soft- ware robots taking the place humans whenever complicated processes or routine tasks like attendance system will be machine controlled. RPA employs software and methodologies that can take advantage of the most recent technologies, such as AI, machine learning, voice recognition, and language processing, to take automation to the next level. As a result, it has become a requirement for corporations of all industries

that want to communicate their business all the way through the digital transformation journey. Educational institutes are moving towards automation which is useful to all or any staff, administrators and students for their various educational activities. RPA can drastically reduce the human dependency for tasks and increase productivity with reduced time.

VII. ACKNOWLEDGMENT

The authors would like to thank Ramrao Adik Institute of Technology, Nerul, Maharashtra, India for their constant support during the course of research.

REFERENCES

[1] J. G. Enr´ıquez, A. Jime´nez-Ram´ırez, F. J. Dom´ınguez-Mayo and J. A. Garc´ıa-Garc´ıa "Robotic Process Automation: A Scientific and Industrial Systematic Mapping Study," in IEEE Access, vol. 8, pp. 39113-39129, 2020, doi: 10.1109/ACCESS.2020.2974934.

[2] A. Leshob, A. Bourgouin and L. Renard, "Towards a Process Analysis Approach to Adopt Robotic Process Automation," 2018 IEEE 15th International Conference on e-Business Engineering (ICEBE), Xi'an, China, 2018, pp. 46-53, doi: 10.1109/ICEBE.2018.00018.

[3] Naveen Joshi, (2019). Here's what RPA means to the education sector

[4] Neil Kinson, (2018). Automate the Education Sector with Education Management Software Solutions, How Automation will impact Education.

[5] Kuppusamy, Palanivel Joseph K, Suresh. (2020). Robotic Process Automation to Smart Education. 3775.

[6] Alcatel-Lucent, (2019). Why Digital Transformation for Education?

[7] Karl Utermohlen, (2019). Four Ways Machine Learning Is Shaping the Future of Education

[8] Ibtehal Talal Nafea, (2018). Machine Learning in Educational Technology, 176-182. http://dx.doi.org/10.5772/intechopen.72906

[9] Savaram Ravindra, (2018). Role of IoT in Education