iJRASET
International Journal For Research in Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 10 **Issue:** VII **Month of publication:** July 2022

DOI: https://doi.org/10.22214/ijraset.2022.45461

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International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 10 Issue VII July 2022- Available at www.ijraset.com

RPA Bot to Automate Students Marks Storage Process

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Abstract: ***Robotic Process Automation is a technology that lets users set up and create a software robot that can carry out tasks including screen scraping, information processing, data scraping, optical character recognition, web scraping and transmitting and receiving data from various systems with or without the assistance of a human. RPA is used in different sectors such as education, retail, business, banking, finance, insurance, healthcare, and marketing. There are many RPA software vendors such as UiPath, Automation anywhere, Blue Prism etc.***

Only 39% of employees' time is spent on tasks that are specific to their roles, according to a McKinsey Global Institute study, Rest is spent on back office jobs such as copy-paste, web search or information gathering. Most of these tasks can be automated using RPA technology. One main feature of RPA is that if there is any repetitive task then a bot can be designed to do that particular task. The bot won't make any mistakes while performing tasks and is very quick and won't get tired. One of the main features used by every software bot is optical character recognition, it can recognize and capture both handwritten and typed text. In order to convert printed text into editable text, optical character recognition (OCR) has been utilised. The accuracy of OCR may be influenced by text preparation and segmentation techniques. It is frequently challenging to obtain text from the image due to differences in scale, design, orientation, complicated visual background, etc. Thus, a variety of OCR programmes, including Tesseract OCR and Microsoft OCR, can be utilised depending on the type of document being processed. The amount of data accessible on the internet has grown significantly since then. RPA web scraping technologies can be used to automate operations as well. For instance, you might use the UiPath automation tool to extract data from LinkedIn job openings and automatically save the resulting information in a CSV data file. Using such tools provided by RPA software vendors, many applications are developed Numerous duties in the sphere of education can be automated, such as synchronising attendance with paper and a pen at all times. There is a critical need for a reliable, secure, and automated monitoring system that may replace the time-consuming, repetitive tasks performed by teaching and non-teaching staff and boost management productivity. Using RPA software tools, we can replace the time-consuming old method with a computer-based system. RPA can be used to automate many of the procedures involved in running a Student Management System as well as to incorporate repetitive operations into an ERP system. Additionally, you can send student-related notifications, post and give assignments, plan classes, announce exam dates, and do a lot more for both a single student and a group of students.

Keywords: Robotic Process Automation, RPA, Data Extraction, OCR, UiPath Studio.

I. INTRODUCTION

Robotic process automation is a technology where a software bot can be trained to execute digital data activities in the same way that humans do. RPA automates job operations that are repetitive and rely on digital data. Queries, computations, creating records, generating reports, copying & pasting of data, and other processes that involve transferring the data across applications are examples of these tasks. In 2012, the word RPA entered the market. Using automated education systems, you may eliminate paperwork and manual procedures for admissions, attendance, meeting scheduling, mailing, assignment, grades, administration, and finance. Automation is a method for handling routine tasks that boosts productivity and efficiency in the educational institution while freeing highly skilled personnel to concentrate on more crucial duties. The organisation's main concern is balancing cost efficiency with other execution goals including scalability, adaptability, security, and compliance. As a result, the industry has experimented with many solutions to balance cost efficiency, with service automation using RPA being one of them. RPA is entirely a software-based solution. The capacity of RPA to automate the repetitive manual processes of obtaining, collecting, updating, analysing, and processing data across systems, which are now performed by millions of human employees shows the use of RPA.

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According to McKinsey Global Institute's study, only 39% of employees' time is spent on activities that are particular to their roles, 28% is spent reading and replying to email, 19% is spent looking for and obtaining information, and the remaining 14% is spent on internal cooperation and communication. Total of these operations, which take up 61 percent of all working time, can be automated using robotic process automation technology. The sole choice when trying to get data from a website for a researcher is to manually extract the data, which might take several hours or days to do.

Numerous operations are automated utilising different magnetic stripe technologies, voice recognition software, radio frequency identification, optical mark recognition (OMR), barcodes, and OCR.

In the current method, maintaining a list of every student is always perceived as a manual procedure requiring a significant amount of paper and pencils. Manual attendance tracking has a long history in India. Biometric attendance systems are still only being used by a small number of organisations and companies. The problem, though, is that it takes a lot of time for an employee to analyse data in order to determine each employee's proper compensation. The RPA tool will receive thorough training on how to determine the appropriate wage for each employee in consideration of their overall contribution to the company.

The Student Management System is an ERP-based solution that manages data for three key stakeholders: students, faculty, and admin. This solution is divided into modules and offers a variety of features. Following are the modules that are available,

1) Faculty and student profiles
2) Submission of Marks
3) Record of Attendance
4) Examination Results Record
5) A list of staff and student information

While the current system is intended to keep track of everything but it is done manually. Many manual operations are automated using this solution. It uses a ChatBot to provide a graphical interface to students, faculty and admin. A ChatBot is a piece of software that mimics human conversation, Speech or text communication. The ChatBot was created with Dialog-Flow technology where keywords are provided as input and produce a relevant answer to the input keyword. Apart from the ChatBot automation, Many of the manual operations that occur inside an ERP system have also been processed using RPA. This has increased the effectiveness of the student management system by automating routine, repetitive tasks with little to no human intervention.

RPA offers a variety of OCR engines that make it simple to extract complicated text from pictures, PDFs, and captchas. Abbyy cloud OCR, Abbyy OCR, Google Cloud Vision OCR, Microsoft Azure Computer Vision OCR, Microsoft OCR, Microsoft Project Oxford Online OCR, and Tesseract OCR are just a few of the OCR activities that are accessible in RPA.

The processing time for an invoice, from receipt to acceptance of payment, is between 4 and 16 days, according to a study by the IT services firm Aberdeen Group. In reality, between 86 and 100 percent of all invoice processing is carried out manually, according to a report by Canon Business Process Services. RPA may be used to automate processes linked to invoice processing in order to speed up the process and decrease processing time.

II. WORKING METHODOLOGY

Robotic process automation is a type of software that can be taught to perform human-like tasks with digital data. Different roles for robotic process automation exist in the educational setting. Using automated education systems, RPA is utilised in the sectors of education to get rid of paperwork and manual processes. Admission, attendance, mailing, assignments, grades, and other tasks can all be handled by the software. The course registration, shortlisting, and enrolling processes are some of the various robotic process automation systems used in the education sector. It entails a lot of difficult and error-prone paper-related chores. To avoid lengthy manual processes, automation is used to validate information, shortlist candidates, and confirm the eligibility of students. Both faculty and students are required to attend several functions and meetings. It is simple to automate the process of updating students and professors on meetings, events, and other important information. Many time-consuming tickets, such as password resets, account unlocks, system reboots, and alert monitoring, can be eliminated via IT automation. The general inquiries from students, staff, and website visitors, such as admission Schedule, admission procedure, and course information, can be automated with the aid of chatbots. A chatbot that uses artificial intelligence and natural language processing can comprehend normal language, learn from previous interactions, and respond to queries much like a human. RPA functions by gaining access to data from already installed systems. One way is by using a method used to harvest vast volumes of data from websites. Data can be extracted from linked in job openings and saved automatically using the UiPath automation tool in a CSV format data file. In this system, data is extracted from websites using a process called web scraping. The method that makes it easier for teachers to teach comes next. Based on a student's participation in class, it determines their attendance.

Their daily presence helps to maintain it. It seeks to give a thorough analysis of an RPA and a case study of how it was used in the education industry. Utilizing tools like the UiPath software's Excel Application Scope, Read Range Activity, For Each Row Activity, etc. this is accomplished. Next is the method for creating a software robot with RPA. where it will manage the IT assets that new hires to an organisation request.

After receiving the new employee's request, the robot will keep an eye on the mailbox. The necessary data will first be extracted and stored in the database. After that, a mail is sent to the relevant department. It extracts the necessary files from email text using the Parse function. Win automation, Windows PowerShell, and Gmail are all used in this technology.

Similar to that, a bot is created to download different photographs, and it is then opened in Microsoft Excel. The Excel sheet receives copies of the Images' URLs.

The Excel file is then accessed in UiPath using Excel activities. The first column is then read and stored in a variable after that. The first column is iterated over, and each cell's link opens the associated image. The image is then scanned, saved in a variable, and the tesseract ocr engine is used to identify the characters in the image. The extracted text will then be printed in the following column of the excel file.

The next method is how Databot will automate invoices so that back office finance or procurement personnel can concentrate on work with a greater added value. Most of the time, straight through processing is possible throughout the whole invoice process thanks to invoice automation.

Next is a method that enables records and databases to be accessed from a platform-free web-based solution by students, instructors, and group administrators. It enables teachers and administrators to publish notices about students, assign tasks, and plan classes and exams for a single student or a group of students.

Information from the GUI is imported using a chart Bot module. RPA enables businesses to outsource ever-increasing amounts of routine administrative labour to efficient, compliant machines. Additionally, it helps the organisation cut costs by reducing procedures and improving accuracy. Importantly, RPA frees humans from mundane tasks so they may concentrate on tasks that call for judgement, creativity, and interpersonal skills.

III. LITERATURE REVIEW

A. Web data extraction with Robot Process Automation. Study on LinkedIn web using UiPath Studio.

Author: Marcu Florentina, The Bucharest University of Economic Studies, Bucharest, ROMANIA

Today, a great deal of information is available online and is frequently used for research, development, and forecasting. Web scraping is a technique used to collect data from websites (extract product details and prices from e-commerce websites, job requirements and benefits from job ads, details about companies - name, location, website, phone, financial results of all banks from Romania, customer contact details, and so on), organise it, and then save it in the format the user wants (csv, excel, json). The UiPath Studio is a programme with sophisticated automation features, including web scraping technologies, that may be downloaded for free (community version) from the internet. If you can see it, UiPath can extract it.

B. Steps Involved in Text Recognition and Recent Research in OCR

Author: K. Karthick, K. B. Ravindrakumar, R.Francis, S.Ilankannan

One of the automatic identification methods that meets the automation requirements in numerous applications is optical character recognition (OCR). With OCR, a machine is able to read information from natural sceneries or other resources in any format. Due to its well defined size and shape, character recognition when typing and printing is simple. Individuals' handwriting varies in the aforementioned ways.

The handwritten OCR system must therefore work hard to understand this distinction in order to recognise a character. In this presentation, we reviewed the various text recognition phases, the classification of handwritten OCR systems according to text type, a study on Chinese and Arabic text recognition, and contemporary OCR application-focused research.The topics of computer vision and digital image processing are expanding quickly and are crucial to many other industries, including multimedia, artificial intelligence, robotics, and many more.

Techniques for segmentation, feature extraction, and classification are all studied in image analysis. Human-computer interaction would make things more interesting and user-friendly because humans communicate with one another quite readily through writing and speech. According to the study, multilingual character segmentation and identification are also doable with a higher rate while still producing optimal outcomes.

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C. Attendance Management System using RPA

Author: Himanshi Prajapati,Akshata Rane, Kavita Vanve, Asst. Prof Mrs. AmrutaChintawar Dept.Electronics and Telecommunication Ramrao Adik Institute of Technology Nerul, India

Educational institutions must regularly monitor attendance, which is a laborious but vital chore. Furthermore, you are erroneous if you think that institutions should solely care about student attendance. To provide equitable compensation, accurate time assessments of the faculty and school management are also crucial. Manual time registration does not allow for the tracking of the time that educational stakeholders are utilising productively. In schools, colleges, and universities, a platform called the Attendance Management System (AMS) is used to monitor daily student attendance.It makes it simpler to get information about a certain student's attendance in a particular class. It also does away with the requirement for proxy attendance. Data accuracy is maintained in a short amount of time. Automation is becoming more common in educational institutions, which will benefit all employees, administrators, and students for their varied educational activities. RPA can boost production while taking up less time by significantly reducing the need for human labour to complete activities.

D. Robotic Process Automation role in Education Field

Author: Neethu V Joy, Sreelakshmi P G Dept. of computer science Carmel college,Mala

Technology is playing a critical role in automating processes that are rule-based, repetitive, time-consuming, and tedious in today's modern educational system. Automated education systems can be used for admission, attendance, meeting scheduling, mailing, assignment, grades, admin, finance, etc., eliminating paperwork and human operations. Through the cloud-based application, web application, or mobile apps, a user can connect, cooperate, and communicate through a variety of ways. The numerous inquiries that the kids and teachers have need speedy replies or solutions. With certified IT staff and a lack of highly experienced support staff, universities must manage and function with constrained resources. Automating routine processes allows educational institutions to be more efficient and productive, saving time so that highly qualified staff may focus on more important duties.

E. Automation with RPA (Robotic Process Automation)

Author: G. Ghosh

Numerous features are offered by robotic process automation. One of its important advantages is the ability to record mouse and keyboard actions and repeat them repeatedly. This essay discusses the software bot created to keep an eye on the employee mailbox during onboarding. The software bot keeps an eye on the mailbox, and when a new email arrives, it retrieves the necessary data from it, including the employee's name, joining date, assets, and other information. It then stores this data in the database and notifies the relevant department about the employee onboarding. When the bot was deployed, the entire process of reading the mail, retrieving the data from the database, and sending a notification took only 43 seconds, compared to nearly five minutes if the task were completed manually. The bot would handle this task very effectively even if there were thousands of mails.

F. An Experimental Performance Analysis on Robotics Process Automation With Open Source OCR Engines: Microsoft OCR And Google Tesseract OCR

Author: T Malathi, D Selvamuthukumaran, C S Diwaan Chandar, V Niranjan

The two primary forms of OCR, Microsoft OCR and Google Tesseract OCR, are analysed in this study. Each OCR engine is designed to extract data from a page under different circumstances, and the differences are noted. While Google Tesseract OCR supports numerous languages, Microsoft OCR is only appropriate for the English language. When a document or image's colours were reversed, Microsoft OCR was unable to retrieve the data, whereas Google Tesseract OCR was successful and is more accustomed to dark backgrounds and light lettering. However, Microsoft OCR can provide details about the retrieved data, such as its location, and can also verify the words that were recovered. Google Tesseract OCR is quicker at OCR on average than both other OCRs. Microsoft OCR takes 15 seconds longer than the average data retrieve time of 12 seconds.

G. Invoice Processing Using Robotic Process Automation

Author: Sagar Sahu, Sania Salwekar, Atharva Pandit, Manoj Patil Computer Engineering, Datta Meghe College of Engineering, Airoli, Navi Mumbai, Maharashtra, India

This paper outlines our recent efforts to create an automotive application that will revolutionise the way finance operations process invoices. Robotic Process Automation (RPA), which may be used for a number of financial and accounting tasks, such as invoice processing, is a classic illustration of how the technology has the potential to increase efficiency.

RPA DataBot can automate data entry, error checking, and some of the judgement calls that the financial team must make when processing bills. Automation can also help to reduce errors in these procedures and the requirement for manual exception management. Employees (or other DataBots) can save invoices in PDF format to a designated folder, which UiPath's RPA DataBot can continuously watch over. Robots start extracting information from an invoice as soon as they find one in the folder. DataBot can read aloud the information that is visible on the invoice using intelligent optical character recognition (OCR) technology and natural language processing skills. Robots first gather the crucial data from each invoice, then, if the enterprise resource planning system isn't already accessible, they utilise their credentials to access it. The required invoice information is then transferred to the robots, who then begin processing each invoice individually. The DataBot are running background tasks throughout the entire process, such as checking the dedicated invoice folder or its email address, running simple checks to see if the company's database is open, and confirming that vendor information (such as the VAT number) on the invoice matches what is already in the database.

H. Intelligent document processing based on rpa and machine learning

Author : xufeng ling,ming gao,dong wang.

RPA is a technology that performs static, repeated activities. It is highly useful for reading PDF files, retrieving necessary data from them, reading data from photos, etc. RPA makes it simple to cooperate with various technologies, like AI, machine learning, NLP, and others. It is used in business as a digital employee who never takes vacation time and is always available. In this study, intelligent document processing is carried out, and document reading utilising RPA and AI is attempted. First, some basic information about the document, like the page number and title, is retrieved using computer vision. Next, NLP is used to extract textual features, which are then mapped based on cosine similarity. Finally, a machine learning algorithm is used to provide a description of the document. There is also a feature for human interaction where the human can confirm whether the description retrieved from the document is accurate or not.

I. Automating Student Management System Using ChatBot and RPA Technology

Author : Vrushil Gajra, Khwajaavais Lakdawala, Rahul Bhanushali, Dr. Sunita Patil

This article demonstrates how RPA may be used to automate many of the processes needed in maintaining a Student Management System and integrate repetitive tasks within an ERP system. Records and databases can be accessible by students, faculty, and group administrators using a platform-free web-based solution that can be used on both computers and mobile devices. In addition to posting and assigning assignments, class schedules, and exam dates for both individual students and groups, it enables Faculty and Admin to post notifications pertaining to Students. It has been demonstrated that employing RPA and ChatBot, Student Information Management within an ERP system can be managed effectively and error-free. It will enable the effective administration of a number of functions based on preset business principles, in addition to automating repetitive operations. The process developed for the suggested solution has combined a number of technologies.

J. A Survey on Breaking Technique of Text-Based CAPTCHA

Author : Jun Chen, Xiangyang Luo, Yanqing Guo, Yi Zhang and Daofu Gong

Security in multimedia has been increasingly concerned with the CAPTCHA. This article describes a number of well-known strategies to solve a commonly used text-based CAPTCHA and has an emphasis on technological improvement in text-based CAPTCHA cracking. A brief synopsis of recent advancements in the field of text-based CAPTCHA cracking is provided in the article's opening paragraph. The second step is the proposal of a framework for text-based CAPTCHA breaking. Preprocessing, segmentation, combining, recognition, post processing, and extra modules make up the majority of the framework's components. Third, a variety of well-known segmentation and recognition algorithms are compared, looked into, and the development of each module's study is described. Finally, the study raises a few points that demand more research. This article discusses the development of the text-based CAPTCHA cracking technique. This study provides and explores numerous text-based CAPTCHAs in the first place. Second, depending on whether or not there is segmentation, we categorise well-known text-based CAPTCHA cracking techniques and characterise their characteristics. In the meanwhile, we present a text-based CAPTCHA cracking technique framework and introduce each component of the framework separately. The key ideas, merits, and drawbacks of current strategies are then contrasted and examined.

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Author	Title	Methodology	Benefits
Marcu Florentina, The Bucharest University of Economic Studies, Bucharest, ROMANIA	Web data extraction with Robot Process Automation. Study on LinkedIn web using UiPath Studio	Using the UiPath automation tool, information may be extracted from LinkedIn job openings and saved automatically in a CSV data file.	Can serve as a model for obtaining information from any website, including eMAG products, Amazon products (including pricing, specifications, and so on), Wikipedia information, booking websites, home appliance platforms, and others.
K. Karthick, K. B. Ravindrakumar, R.Francis, S.Ilankannan	Steps Involved in Text Recognition and Recent Research in OCR; A Study	The many stages of text recognition, the classification of handwritten OCR systems based on text type, a study of Chinese and Arabic text recognition, and new OCR application-focused research are all covered.	Less calculation time is required to achieve optimal results, and multilingual character segmentation and recognition can be done more quickly.
1st Himanshi Prajapati, 2nd Akshata Rane, 3rd Kavita Vanve, 4th Asst.Prof Mrs. Amruta Chintawar , Dept. Electronics and Telecommunication Ramrao Adik Institute of Technology Nerul, India	Attendance Management System using RPA	This system is in charge of recording the attendance data for each student. Based on a student's participation in class, it determines their attendance. Their daily presence helps to maintain it.	For their numerous instructional operations, educational institutions that are going toward automation use this technology, which is beneficial to all or any staff, administrators, and students.
Neethu V Joy, Sreelakshmi P G Dept. of computer science Carmel college,Mala	Robotic Process Automation role in Education Field	The use of robotic process automation in education is discussed in this paper. Processes for enrolling in courses, shortlisting candidates, and managing attendance are all handled by chatbots.	Enrol students in classes, Reduce spending, increasing output, There is no need to code for implementation, cost reductions.
G. Ghosh Application Development, Mphasis, Bangalore, India	Automation with RPA (Robotic Process Automation)	The robot will keep an eye on a mailbox, and when a new employee requests IT resources, it will first gather the necessary data and add it to the database. Then it sends a mail to the relevant department.	We can conduct further study in the future to combine machine learning, natural language processing, and robotic process automation, and we can create a more durable robot.
T Malathi D Selvamuthukumaran, C S Diwaan Chandar, V Niranjan and A K Swasthika	An Experimental Performance Analysis on Robotics Process Automation (RPA) With Open Source OCR Engines: Microsoft Ocr And Google Tesseract OCR	Utilize RPA to evaluate the precision of two open source OCR engines.	In order to convert printed text into text editable , optical character recognition (OCR) has been utilised. OCR is a very helpful and widely used method in many applications.
Sagar Sahu, Sania Salwekar, Atharva Pandit, Manoj Patil Computer Engineering, Datta Meghe College of Engineering, Airoli, Navi Mumbai, Maharashtra, India	Invoice Processing Using Robotic Process Automation	Capture your invoices from their original source, such as a fax, email, electronic image, or paper copy, and automatically extract key information for import into your financial systems using clever software. You should also validate your invoices by comparing the data on them to data files, such as the supplier name, the invoice amount, and the Purchase Order number. To	Compared to manually processing paper invoices, automated invoice processing helps to save a significant amount of time and money while improving efficiency and data quality.

		ensure that the invoice corresponds to the initial order, compare and verify the purchase order system.	
Xufeng Ling, Dong Wang Department of Engineering Shanghai Normal University Tianhua College. Ming Gao R&D dept. Beijing AiStream Co. Ltd Beijing, P.R.China	Intelligent document processing based on RPA and machine learning	First, use OCR to recognise the specific element in the document (whether it be a PDF or photo); next, use NLEP to extract the document's text features; and last, suggest an automatic description and classification using a machine learning algorithm.	As a framework, RPA offers flexibility and adaptability to meet the needs of various applications by making it simple to modify processes and nodes. Flexible + intelligent processing capability can be created by modularizing the intelligent algorithm and combining it with other RPA nodes as necessary.
Dr. Sunita Patil (Prof), Vrushil Gajra, Khwajaavais Lakdawala, Rahul Bhanushali, UG student, Department of Computer Engineering K.J. Somaiya Institute of Engineering and Information Technology (KJSIEIT) Sion(E), Mumbai. University of Mumbai	Automating Student Management System using Chatbot and RPA Technology	Students, faculty, and group administrators can access records and databases from a platform-free web-based solution utilising both desktop computers and mobile phones thanks to the way the solution is built. It enables faculty and administration to publish student-related alerts, assignments, class schedules, exam dates, and many other things for both a single student and a group of students. Additionally, the system includes a Chatbot Module that enables users to access crucial data via a GUI.	When robotizing ERP Systems, RPA offers many advantages, including high-quality outcomes, a quicker return on investment, a reduction in labour costs, time savings, the simplification and automation of laborious business tasks or processes, and lower business costs.

IV. CONCLUSION

Many features and applications of RPA technology using UiPath studio are being discussed. First of all, In comparison to different OCR tools available, Tesseract OCR provides better results among all OCR tools with different types of images such as images having a variety of backgrounds, different fonts, different font colour. The data being fetched when the there are changes in saturation, quality of images, to what extent the image is zoomed makes a huge difference in fetching the data from a image. And Tesseract OCR has provided better results in comparison to Microsoft OCR. But if we go for accuracy, Microsoft OCR is more promising.

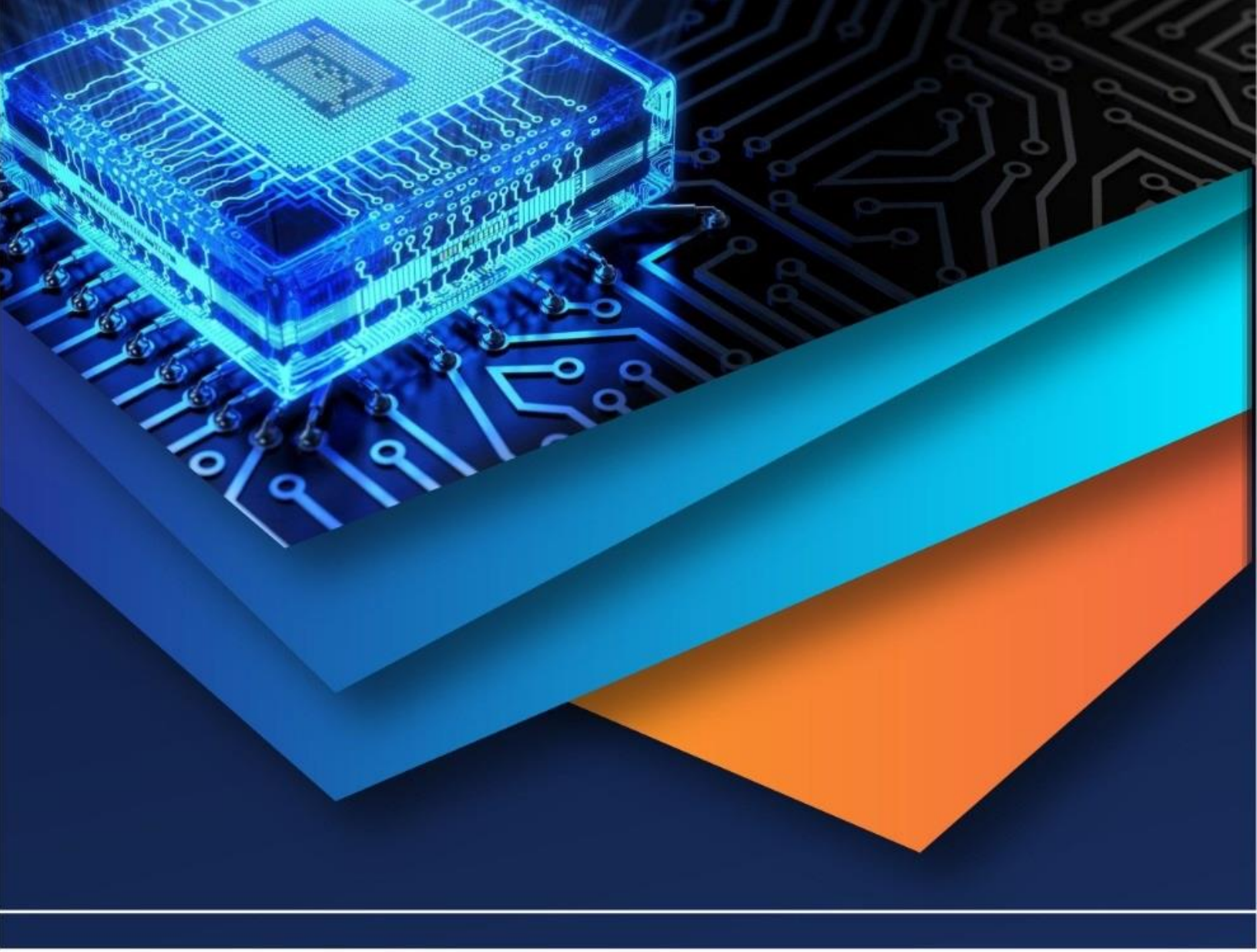
The technique of data extraction using RPA and an example of data extraction from the LinkedIn website using UiPath Studio are covered. Data can be extracted regarding the share of IT positions in all jobs listed or an overview of supply and demand on the labour market. The information can be used to compare IT jobs to jobs in finance, accounting, construction, engineering, and other fields. As a result, the example provided can be used as a template for extracting data from any website, including eMAG items, Amazon products (such as pricing, specifications, and so on), information from Wikipedia, booking sites, websites for home appliances, platforms for job postings, and so forth. And this can be used in data collection for data analysis and data mining which will pre-process the data and also give valuable insights on the collected data using graphs and analyse data from various sources or make predictions Robotic Process Automation (RPA) provides software robots can be used to do repetitive tasks. To advance automation, RPA uses software and procedures that can benefit from cutting-edge technology like AI, machine learning, speech recognition, and language processing. Automation is becoming more common in educational institutions, which will benefit all employees, administrators, and students for their varied educational activities. RPA can boost production while taking up less time by significantly reducing the need for human labour to complete activities.

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[5] International Journal of Computer Sciences and Engineering (Automation with RPA)
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[8] Intelligent document processing based on RPA and machine learning
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