Method of Robotic Process Automation in Invoice Processing and Mailing – A Survey

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Abstract: **Invoice processing and mailing refers to the task that extracts data from various invoices and store it in a excel file, after that an email should automatically be sent to the mentioned email address. And to reduce human intervention in sensitive and repetitive task otherwise a small wrong entry may lead to consequences in business statistical results. Invoices maintaining is an essential segment of business for various purpose so this project can be extensive used to overcome human workforce handling this job so they can be used in other activities that require humanly decision.**

Keywords: **Robotic process automation, invoice processing and mailing, computer vision for visual perception, software robotics.**

1. Introduction

The project is in the field of robotic process automation (RPA). RPA is the process of using software to automate repetitive and rule-based operations that previously required human interaction. Robotic process automation (RPA) is a software technique that makes it simple to design, deploy, and manage software robots that mimic human movements while dealing with digital systems and software. Software robots, like people, can recognize what's on a screen, type the correct keystrokes, traverse systems, locate and extract data, and do a wide range of prescribed activities. Software robots, on the other hand, can roll in the hay faster and more reliably than humans, without having to get up and stretch or take a break for tea. The project is to automate task of extracting data from various invoices and store it in a excel file, after that an email should automatically sent to the mentioned email address. The objective of this project it to reduce the human labor work in this repetitive task and so that they can engage themselves in activities that require human interaction so as to increase the overall performance and productivity of the business. Computer software or robots are programmed to work in the same way that people interact with corporate systems. RPA could also be a software technique for creating, deploying, and managing software robots that replicate human gestures while handling digital systems and software. Software robots, like people, can read what's on a screen, enter the correct keystrokes, navigate systems, seek and extract data, and do a wide range of specified tasks. On the other side, software robots can roll in the hay faster and more reliably than humans, without having to stand

up and stretch or stop for a cup of tea. There are three types of robotic process automation. Attendant RPA is the least human-interaction-required type of RPA. Unattended RPA requires no human participation, while hybrid RPA combines both attended and unattended RPA. The most prevalent type of automation is unattended automation, which makes work easier by automating tasks such as data processing in the background. RPA's importance has grown over time as it outperforms traditional automation. One of the most significant benefits of RPA is that it is less expensive to automate in the long run due to the benefits gained. RPA does not interfere with an organization's existing systems. It can be used without interfering with business processes.

2. Benefits of RPA

1. *Cost:* In terms of cost, RPA is fairly useful in the long run. It is very scalable and does not disrupt company processes. RPA can save you up to 80% on processing costs. In less than a year, most businesses see a favorable return on their investment.
2. *Accuracy:* Robotic process automation (RPA) entails the use of robots and software. Because they are not affected by fatigue or disorientation, their accuracy is quite good. They are unable to make mistakes and must follow all orders.
3. *Reliability:* They are dependable since they follow instructions and carry out tasks in accordance with regulations and standards. Employees are relieved of the stress that comes with accumulating duties and exhaustion thanks to RPA.
4. *Consistency:* Robotics is a non-invasive, safe technology that does not disrupt natural systems and ensures complete uniformity in task execution across the board, every time.
5. *Increased Employee Productivity:* Finally, RPA enables humans and robots to do what they do best. Since RPA frees employees from mundane tasks, they can focus more on client and customer interaction, relationship management, and other areas where they naturally thrive. You will have more business if your clients and customers are satisfied.
6. *Improved Customer/Client Contact:* Improved customer /client engagement leads to enhanced customer and client satisfaction as a result of higher-quality work provided with

high precision. This only strengthens the company's reputation.

3. Objective

The objective of this project it to reduce the human labour work in this repetitive task and so that they can engage themselves in activities that require human interaction so as to increase the overall performance and productivity of the business. The project is to automate task of extracting data from various invoices and store it in a excel file, after that an email should automatically sent to the mentioned email address.

4. Literature Review

[1] The use of computer vision for visual perception to improve RPA results is typically advised in this composition. All UiPath Robots can determine every piece of an interface using RPA and computer vision technology. Commerce with locations and dispatch operations (including attachments), navigation within operations (ERP, CRM, etc.), uploading data from external sources to the software interface and onto the database, communication with guests within couriers using chatbots, and providing predictive analytics to form opinions supported statistics and data processing are all stylish processes suitable for RPA operation. Although the RPA software offered on request has certain AI capabilities, it is unable to adapt to changes in the system without the use of mortal commerce. External plugins and APIs are typically used to address these concerns, allowing for improved rudiments detection and making the RPA framework more flexible and ready to adapt to slight changes in the UI of tested software.

[2] The fundamental approaches for using RPA to automate software testing are discussed in this paper. This paper outlines a proposed method for software test robotization that enables for faster and more reliable execution of tests. Two basic ways to software test robotization are contrasted in this composition, and the new system-assisted RPA operation is widely suggested. The Selenium Web Motorist demonstrated a shorter or faster execution time for a variety of actions, but it lacks data generation choices and hence the ability to switch to a new software during test execution. Tests in WorkFusion Design Studio are typically created without the use of a programming language. It also has advanced capability that allows you to check the test's pre-conditions and post-conditions automatically, as well as acquire test results using other software.

[3] A proposal to automatically test RPA systems has been provided throughout this work. Currently, UI log information is supported by a test terrain that simulates the behavior of the important system. Robots are also tested against this synthetic system rather than the real one, lowering the risk of causing damage to the real one. This proposition is currently being validated in a real R&D design within the Spanish government-funded enterprise Servinfom S. A. On the one hand, the test terrain is created as a bogus activity that uses UI log information to simulate the important terrain. The test suit, on the other hand, determines whether the robot can duplicate the UI log's joke. During a controlled script, a prototype was built and tested.

[4] RPA is projected to repurpose the job of the auditor by automating routine tasks and focusing on higher-order thinking skills, resulting in improved audit quality. Because RPA has the potential to reshape the audit profession, the auditor's position would be rebuilt to emphasize the assessment component of audit procedures rather than being a data collector, processor, analyzer, and propagator. Manual and boring audit procedures such as placating, internal control testing, and detail testing can all be automated from an auditing standpoint.

[5] The RPA process analysis model is compared to the traditional model using a variety of comparison characteristics such as level of sophistication, time taken, frequency of change, screen usage, and transaction volume, and it was discovered that the suggested method outperformed the traditional way. It is the practice of automating routine business processes with 'software robots' that do a variety of activities for you. It's the technique of using 'software robots' to automate normal corporate processes.

[6] In this paper, RPA is used to understand robotization of various UI scripts, without writing devoted software to apply them. The thing of this paper is to vend the study of using the newest RPA technologies and exploration so as to enhance the state-of-the- art in UI test robotization. To realize this, first we have to apply several complex test scripts using UiPath/ BluePrism driving to make an inventory of strengths and weaknesses with regard to testing. Also, we have to support them by integrating state-of-the- art tools and approaches from the testing exploration.

[7] This paper addresses the issue that enterprise terrain is facing by using RPA instead of manual processing, which results in inefficiencies and high mistake rates. This paper investigates the development and process design of RPA and presents a framework for evaluating the benefits provided by RPA in order to assist company decision-makers. This research is conducted for the benefit of firms that are in the process of using RPA and need to switch from a waterfall to an agile development approach. In order to prevent wasting time and money on a full development project that later turns out to be unsatisfactory to users.

[8] This exploration proposes strategy to gather information all the more effectively with exceptionally high exactness. This proposed technique uses the idea of RPA to gather information from source. This technique will be valuable to limited scope associations because of its extremely simple execution and simplicity of exportation of information in required configuration. The goal of this work is to demonstrate the suitability of Robotic Process Automation for data mining and collection, and UiPath is the RPA tool used to do this. With the use of an RPA device, a product bot is created and changed to follow a preset flowchart. This data mining method can collect data from a variety of sources and organizations, including frameworks that do not support APIs. The RPA channels incorporated straightforwardly into work process making the framework outrageous effective and basic.

5. Challenges in RPA

1. Since this old method of processing invoices necessitates a lot of contact and manual data entry, human error could be a major issue.
2. Delay in individually uploading the invoice is also a problem because it takes a long time.
3. Leading a team for various operations and activities necessitates an educated and experienced leader, which can be costly to a company because it necessitates extra management efforts.
4. SLA (Service Level Agreement) branching includes a list of issues that can cause the technique to fail, such as uptime and downtime availability, support hours, response and repair times, SLA Credits, and termination rights.
5. Workforce scalability can be a delicate issue since it necessitates constant monitoring and management of performance and dependability, cost pressures, application footprint, and identity access management, among other things.
6. Natural catastrophes, such as earthquakes, floods, and hurricanes, tornadoes, and viral pandemics (COVID-19), which have an impact on the economic loss following an incidence, are things that business owners and organisations cannot expect to understand.

6. Methodology

Selenium WebDriver may be a collection of open-source APIs which are wont to automate the testing of an internet application. Selenium WebDriver tool is employed to automate web application testing to verify that it works needless to say. It works with a variety of browsers. To create test scripts, WebDriver lets you choose a programming language. As previously stated, it is an improvement to Selenium RC in that it overcomes a few shortcomings. Although Selenium WebDriver is unable to handle window components, this limitation is frequently bypassed via the use of technologies such as Sikuli, Auto IT, and others. Selenium provides drivers for each browser, and the browser driver communicates with the relevant browser by creating a secure connection, without revealing the internal logic of browser capabilities. These browser drivers are also particular to the language used to automate test suites, such as C#, Python, or Java.

WorkFusion is one among the foremost reliable intelligent automation vendors. They use AI and RPA to supply automation on a huge scale. WorkFusion integrates various technologies like pre-trained bots, proprietary AI solutions, and advanced analytics to automate a good range of business processes. Overall, WorkFusion can help organizations to reduce costs, improve productivity, and scale rapidly. Employees can specialize in things requiring human intelligence, while software bots can take over mundane operations.

Invoice processing and mailing refers to the task of replicating essential data necessary to be maintained in the business from various invoices present in pdf format to the excel sheet and mailing it to the mentioned owner email address. An appropriate transfer of data from the invoice to excel sheet is most essential because if some data is mismatched or entered wrongly it may lead to inappropriate statistical outcome, resulting in revaluation of all invoice entries. This situation may be encountered if the task of transferring is done by human force but can be avoided when worked with digital work force or automation as they have higher accuracy rate and performance.
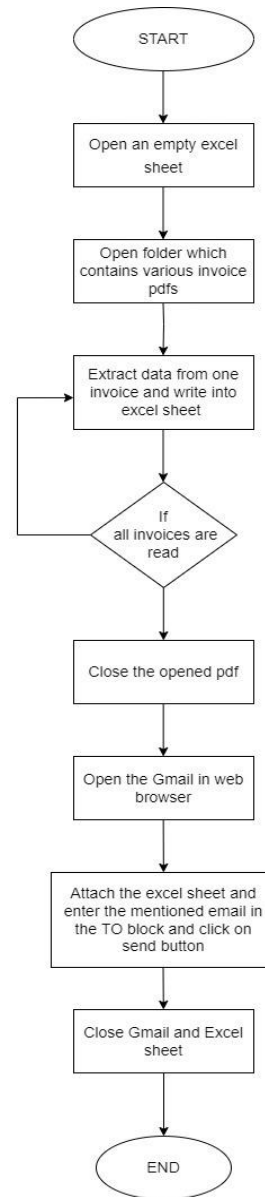

Fig. 1. Flowchart of proposed method

The project extracts data from various invoices present in the pdf format and store them into excel sheet which ease to refer to single excel sheet that contains data of various invoices rather looking down into various invoices when necessary and later hand in this excel sheet to the owner through email.

Automating this overcomes human errors that can be done while data transferring from invoices to excel or else which would result in inaccurate statistical outcome for invoices data analysis. And reducing human efforts for this repetitive task and

using them the efforts in other process that require human intervention.

The folder containing the invoice pdfs is opened and an empty excel sheet is opened. The data from one pdf is extracted and written into excel sheet. The pdf is closed on reading all required data. The process repeats till all pdfs are read. Gmail is opened in the web browser. The excel sheet is attached and email is mentioned in the TO block. The email is then sent to the mentioned email address. The Gmail and the excel sheet is closed after the process is completed.

7. Conclusion

The design is in the RPA field (Robotic Process Automation). RPA is a type of business process automation technology that uses tropical software robots (bots) or artificial intelligence (AI)/digital workforce to automate business processes. It's sometimes referred to as software robotics. The design is to automate task of rooting data from colorful checks and store it in a excel train, after that an dispatch should automatically transferred to the mentioned dispatch address. It would be largely useful in those fields of business with deal with recording tab data from colorful checks that's demanded for future reference for business statistical analysis. The design excerpts data from colorful checks present in the pdf format and store them into excel distance which ease to relate to single excel distance that contains data of colorful checks rather looking down into colorful checks when necessary and after hand in this excel distance to the proprietor through dispatch. Colorful associations can use RPA to help support their business durability (BC) plans by erecting bots that can take on tasks generally handled by outsourced services in the event those services are knocked offline. RPA might give you good value in stage alone tasks, but it takes time and plutocrat to set up. It's a bad idea to cut corners on RPA, too, since a miscalibration will lead to crimes. A hamstrung process won't be converted simply because of adding some "smartness" at the top. Some problems aren't a good fit for RPA, especially when the stakes are high. At present, the RPA is still limited to people for designing the workflow, it's not make smart enough to make and tone heal itself.

References

[1] N. Yatskiv, S. Yatskiv and A. Vasylyk, "Method of Robotic Process Automation in Software Testing Using Artificial Intelligence," 2020 10th International Conference on Advanced Computer Information Technologies (ACIT), 2020, pp. 501-504.

[2] S. Yatskiv, I. Voytyuk, N. Yatskiv, O. Kushnir, Y. Trufanova and V. Panasyuk, "Improved Method of Software Automation Testing Based on the Robotic Process Automation Technology," 2019 9th International Conference on Advanced Computer Information Technologies (ACIT), 2019, pp. 293-296.

[3] J. Chacón Montero, A. Jimenez Ramirez and J. Gonzalez Enríquez, "Towards a Method for Automated Testing in Robotic Process Automation Projects," 2019 IEEE/ACM 14th International Workshop on Automation of Software Test (AST), 2019, pp. 42-47.

[4] Moffitt, Kevin C., Andrea M. Rozario, and Miklos A. Vasarhelyi. "Robotic process automation for auditing." Journal of emerging technologies in accounting 15.1 (2018): 1-10.

[5] D. H. Timbadia, P. Jigishu Shah, S. Sudhanvan and S. Agrawal, "Robotic Process Automation Through Advance Process Analysis Model," 2020 International Conference on Inventive Computation Technologies (ICICT), 2020, pp. 953-959.

[6] Cernat, Marina, Adelina-Nicoleta Staicu, and Alin Stefanescu. "Improving UI Test Automation using Robotic Process Automation." In ICSOFT, pp. 260-267. 2020.

[7] Y. W. Ma, D. P. Lin, S. J. Chen, H. Y. Chu and J. L. Chen, "System Design and Development for Robotic Process Automation," 2019 IEEE International Conference on Smart Cloud (SmartCloud), 2019, pp. 187-189.

[8] Desai, Devanshi, Ansh Jain, Dhaivat Naik, Nishita Panchal, and Dattatray Sawant. "Invoice Processing using RPA & AI." Available at SSRN 3852575 (2021).

[9] Sahu, S., Salwekar, S., Pandit, A. and Patil, M., 2020. Invoice Processing Using Robotic Process Automation.

[10] Surensinffotek.com. 2019. Invoice Management with Robotic Process Automation, Surensinffotek. https://surensinffotek.com/blog/invoice-management-with-rpa-robotic-process-automation

[11] Retiwalla, R. (2020, September 11). Using WorkFusion for Robotic Process Automation (RPA) & Intelligent Automation. https://www.productiveedge.com/2020/07/01/workfusion-rpa-intelligent-automation/

[12] Selenium Webdriver Tutorial with Examples. (2021, October 12). https://www.browserstack.com/guide/selenium-webdriver-tutorial