

An Approach towards Finance Receipting Using Robotic Process Automation Techniques

Dr. Sasidhar Babu Suvanam¹, M. Abhishek, K. Srihari², MD. Sailesh Tushar Sagore³, Hrishikesh Karthikeya S⁴, Dr. Vijayalakshmi Yellepeddi⁵

¹*Professor, School of CSE, Presidency University, Bangalore, India.*

^{2,3}*B. Tech Final Year, Department of Computer Science Engineering, Presidency University, Bangalore*

⁴*B. Tech Third Year, Department of CSE, MIT, Manipal Academy of Higher Education, Bangalore*

⁵*Bishop Cotton Academy of Professional Management, Bangalore*

Abstract—This paper explores the implementation of Robotic Process Automation (RPA) using UiPath to automate the financial receipting process. In many business environments, the traditional method of manually generating and distributing financial receipts is time-consuming, error-prone, and inefficient. This paper aims to address these challenges by automating the extraction of transaction data from an Excel file, populating a predefined credit card receipt template with that data, and saving the generated receipts into specified folders. The automation process also includes emailing the receipts to customers based on the email addresses provided in the Excel sheet.

The automation workflow ensures improved accuracy, efficiency, and scalability, eliminating the need for manual intervention in repetitive tasks. The paper is designed to handle large transaction volumes, enabling businesses to reduce operational costs while ensuring data security and compliance with relevant regulations. Key outcomes include faster turnaround times for receipt generation, reduced human errors, enhanced customer satisfaction, and the ability to scale the solution as transaction volumes grow. This paper demonstrates how RPA can transform back-office operations in finance by automating essential processes and improving overall business efficiency.

Index Terms—Finance Automation, Robotic Process Automation, UiPath, Receipt Generation, Financial Workflow.

them via email can be time-consuming, prone to errors, and resource-intensive. This paper addresses these challenges by implementing Robotic Process Automation (RPA) through UiPath to automate the end-to-end process of finance receipting.

The paper focuses on automating the generation of credit card receipts using a predefined template. By extracting transaction and customer data from an Excel sheet, the RPA bot populates the corresponding fields in the receipt template, such as customer details, transaction ID, and total amount. The completed receipt is then saved in designated folders, with each receipt uniquely tailored to individual customers. To further streamline the process, the bot is designed to automatically send these receipts to the respective customers via email, ensuring timely delivery without human intervention.

This automation reduces manual effort, enhances accuracy, and ensures consistency in the receipting process. By leveraging RPA, the paper highlights the transformative potential of automation in financial operations, particularly in handling repetitive tasks at scale. The solution not only improves operational efficiency but also contributes to better customer service by providing quick and reliable receipt generation and delivery.

I. INTRODUCTION

In today's fast-paced financial environments, businesses that manage high volumes of transactions often face challenges in ensuring accuracy, timeliness, and efficiency when generating and distributing financial receipts. The traditional manual process of creating receipts, filling in customer data, and sending

II. LITERATURE REVIEW

The automation of financial processes has seen significant advancements over the last decade, with several methods being used to manage financial receipting. Traditionally, manual processes have been employed, where employees are responsible for entering data into spreadsheets, generating receipts, and

sending them to customers. Manual data entry remains one of the most flexible approaches, allowing employees to handle unique or complex transactions on an individual basis. However, this flexibility comes at the cost of scalability. As businesses grow and transaction volumes increase, manual data entry becomes unsustainable due to the high labor costs and the significant risk of human error. Studies have shown that manual processes can lead to incorrect data entry, inconsistent formatting, and misplaced or delayed receipts, which can impact both business operations and customer satisfaction.

One of the earliest approaches to improving financial receipting was the introduction of spreadsheets like Microsoft Excel. Excel's built-in functionalities such as formulas, pivot tables, and templates offer businesses a basic level of automation. While Excel allows for some level of data management and calculation, it still requires manual input and lacks integration with email systems or other financial tools. As a result, it becomes inefficient for businesses with large transaction volumes. Moreover, spreadsheets are prone to formula errors and require manual oversight to ensure accuracy, which makes them unreliable for highly repetitive financial processes.

Semi-automated solutions, such as using macros or scripts, were later introduced to address some of these limitations. Macros can automate repetitive tasks such as formatting or basic data entry in spreadsheets. However, macros are limited in scope, and their functionality often breaks if there are changes in input formats or templates. Additionally, writing and maintaining macros requires specialized programming knowledge, which many businesses lack. Macros also fail to handle the complete receipting workflow, as they do not automate email distribution or document management, requiring significant manual intervention for certain steps.

More advanced automation systems, such as accounting software (e.g., QuickBooks, FreshBooks), offer businesses a way to generate financial documents such as receipts and invoices automatically. These tools come with features that allow integration with payment gateways, automating data entry for transactions. However, they often have limited customizability in terms of receipt templates and may not fully integrate with a company's specific financial workflow. Additionally, these software solutions tend to be

subscription-based, which can become expensive for small businesses.

Enterprise Resource Planning (ERP) systems (e.g., SAP, Oracle) represent a more comprehensive approach to financial automation. ERPs integrate multiple business processes into a single system, allowing for large-scale automation of tasks such as receipting, invoicing, and payroll. However, ERP systems are costly to implement and maintain, and their complexity often requires businesses to hire specialized staff for setup and maintenance. For small to mid-sized businesses, the high cost of ERP systems often outweighs their benefits, making them an impractical solution for receipting automation.

In recent years, Robotic Process Automation (RPA) has gained significant traction as a flexible and scalable solution for automating repetitive tasks in finance. Unlike macros or accounting software, RPA platforms such as UiPath can automate a wide range of tasks, from data extraction and document generation to email automation. RPA bots mimic human actions, allowing them to interact with multiple systems, extract data from Excel sheets, populate templates, and send emails autonomously. The advantage of RPA is that it can be easily adapted to existing business processes without requiring significant changes to the company's IT infrastructure. Recent studies have shown that businesses using RPA for financial processes, such as receipting, have seen significant reductions in error rates and processing times, while also improving scalability and operational efficiency.

III. OBJECTIVES

A. Automate Data Extraction from Excel

The primary objective of this paper is to develop an automated process that extracts transaction and customer data from an Excel sheet. This includes details such as receipt numbers, customer information, transaction IDs, and amounts, ensuring that the data is accurately pulled into the receipt template without manual intervention.

B. Streamline Receipt Generation

Another key objective is to automate the population of a predefined credit card receipt template using the data extracted from the Excel sheet. The paper aims to ensure that the correct information is inserted into the

appropriate fields, thereby minimizing human error and increasing the efficiency of the receipting process.

C. Automate File Management and Organization

Once the receipt template is populated, the next objective is to automate the saving of these receipts into specified folders. This ensures that each customer's receipt is stored systematically in unique files, with file names and locations determined by the customer's information, making future retrieval and record-keeping easier.

D. Enable Automated Email Dispatch

A crucial objective of the paper is to automate the process of emailing the generated receipts to the respective customers. By utilizing the email addresses provided in the Excel sheet, the automation workflow will send personalized receipts directly to each customer, ensuring timely delivery and reducing manual effort.

E. Enhance Process Accuracy and Efficiency

The overall goal is to increase the accuracy of the receipting process by eliminating human errors such as incorrect data entry. Additionally, the paper aims to boost efficiency by reducing the time and effort required to generate and send financial receipts, particularly for businesses handling large volumes of transactions.

F. Improve Scalability and Flexibility

The RPA solution is designed with scalability in mind, allowing the process to handle high transaction volumes without degradation in performance. The paper also aims to ensure flexibility so that the automation can be easily modified to adapt to different receipt templates or email platforms, depending on the business's evolving needs.

G. Ensure Data Security and Compliance

An important objective is to ensure that the automation process adheres to data protection standards, especially when dealing with sensitive customer information, such as credit card numbers and email addresses. The paper aims to implement secure handling, storage, and transmission of data to comply with relevant security and privacy regulations.

IV. EXISTING METHOD

A. Manual Data Entry and Receipting

This method involves manually inputting transaction details into templates or forms to generate receipts. Employees extract relevant information from sales or transaction records, input the data into a receipt template, and then either print or email the receipts to customers. This is typically done on a transaction-by-transaction basis.

B. Excel-Based Receipting

Many businesses use Microsoft Excel to manage transaction data and generate receipts. Excel provides basic tools for organizing data and can be used to create templates where transaction information is manually or semi-automatically entered. Businesses often use formulas or simple automation to calculate totals and populate fields within the receipt template.

C. Macro Automation in Excel

To enhance the Excel-based process, some businesses use macros. Macros are scripts that automate repetitive tasks, such as filling out receipt templates with transaction data. This method allows for some degree of automation, particularly in cases where the same template is used repeatedly with only minor data changes.

D. Basic Accounting Software

Accounting software is widely used for automating various financial tasks, including receipting. These programs can automatically generate receipts based on transaction data entered into the system. They also provide features for managing customer data, issuing receipts, and tracking payments in a more structured manner.

E. Email-Based Receipting

In this method, receipts are manually or semi-automatically generated and then emailed to customers. Some businesses manually create receipts and attach them to emails, while others use software solutions that can automatically send receipts via email based on transaction triggers.

F. Document Management Systems

Some businesses utilize document management systems to store and organize digital receipts. While these systems primarily focus on record-keeping and

retrieval, they are often integrated with receipting processes to ensure that receipts are automatically saved and categorized once generated.

G. Customer Relationship Management (CRM)

Systems with Receipting Features

CRM systems often include modules or features for generating and managing receipts, particularly in industries with high levels of customer interaction. These systems can store customer data and automatically generate receipts based on transaction histories.

H. Point of Sale (POS) Systems

POS systems are used in retail and hospitality environments to manage sales transactions. These systems automatically generate and print receipts at the point of sale, providing customers with receipts in real time. Many POS systems can also email receipts to customers or store them digitally.

I. Proposed Method

The proposed method involves using Robotic Process Automation (RPA) with UiPath to automate the entire finance receipting process. This method will replace the existing manual or semi-automated methods with a fully automated solution that handles data extraction, receipt generation, and email distribution. The key components of the proposed method are as follows:

J. Data Extraction from Excel

The first step in the automation process is to extract transaction data from an Excel file that contains information such as receipt numbers, customer details, transaction IDs, amounts, and email addresses. UiPath's built-in Excel activities will be used to read and structure this data into a Data Table format, allowing the bot to process each transaction efficiently.

K. Dynamic Template Population

Once the transaction data is extracted, the RPA bot will dynamically populate a predefined credit card receipt template with the relevant information for each transaction. Fields such as customer name, receipt number, transaction date, and amount will be filled in automatically. UiPath's Word or PDF automation activities will be employed to ensure accurate data insertion into the receipt template.

L. Automated File Saving

After the receipt template is populated, the generated receipt will be saved as a separate file in a designated folder. The bot will create a folder structure based on business requirements (e.g., by customer name or transaction date) and use unique file names to organize the receipts. This ensures that the receipts are properly stored and easily accessible.

M. Email Dispatch with Receipts

The next step is to automate the emailing of receipts to customers. The RPA bot will retrieve customer email addresses from the Excel file and send each customer their corresponding receipt as an attachment. UiPath's email automation activities (e.g., SMTP, Outlook, or Gmail integration) will be used to send personalized emails with the receipts attached.

N. Error Handling and Exception Management

To ensure the robustness of the automation process, error-handling mechanisms will be integrated. The bot will log any errors encountered, such as missing data or invalid email addresses, and will either attempt to correct the error (if possible) or skip the faulty record and continue processing other transactions. Detailed logs will be maintained for review, allowing for quick resolution of any issues.

O. Testing and Validation

The RPA workflow will undergo rigorous testing to ensure that it functions as intended. Test cases will be developed to verify that data extraction, template population, file saving, and email dispatch work correctly across different scenarios. This phase will ensure that the bot handles a variety of transaction types and conditions without errors.

P. Deployment and Monitoring

Once the system is fully tested, it will be deployed in a live environment. The bot will be scheduled to run at regular intervals (e.g., daily or weekly), depending on the volume of transactions. Continuous monitoring will be implemented to ensure that the bot operates smoothly, with any issues being logged for further analysis.

By automating these processes, the proposed method will significantly reduce manual effort, improve accuracy, and enable businesses to handle large transaction volumes efficiently. This method ensures

that receipts are generated and distributed quickly, securely, and with minimal human intervention.

V. METHODOLOGY

The methodology for this paper is structured into several stages, each designed to implement a comprehensive and efficient RPA solution for automating the receipting process. This involves planning, development, testing, and deployment, with the goal of creating a system that automates data extraction, receipt generation, file management, and email distribution.

A. Requirement Gathering and Process Analysis

The first step is to gather all the necessary requirements for the paper. This includes understanding the structure of the Excel data, the format of the credit card receipt template, and the specific business rules that need to be followed. A thorough process analysis is conducted to map out the current manual steps involved in data extraction, receipt filling, file saving, and emailing. This helps in identifying which parts of the process can be automated and the expected outcomes.

B. Designing the RPA Workflow

Based on the process analysis, the next step is to design the RPA workflow using UiPath Studio. The design phase involves creating a step-by-step blueprint that outlines how the automation will:

C. Read data from the Excel file

Populate the receipt template with the extracted data. Save the filled receipt as a unique file in the specified folders. Send an email with the receipt attached to the customer's email address. In this stage, the mapping between the Excel columns and the receipt template fields is established. Additionally, the folder structure and file-naming conventions are defined to ensure consistency in how receipts are saved.

D. Development and Implementation

The UiPath platform is used to develop the automation workflow. The key steps in this development process are:

1. Excel Data Extraction: Using UiPath's built-in activities to read the Excel data into a structured format (DataTable).

2. Template Population: Implementing logic to loop through the Excel rows and fill the corresponding fields in the credit card receipt template. This is achieved using UiPath activities that allow dynamic manipulation of Word or PDF templates.

3. File Saving: The automated system saves each filled receipt in separate folders, ensuring the files are named correctly based on customer information (e.g., receipt number or customer name).

4. Email Automation: UiPath's email automation activities are configured to send the generated receipts to each customer's email address with personalized subject lines and body content.

E. Testing and Validation

After development, the automation workflow undergoes rigorous testing to ensure that it functions as expected. Several test cases are prepared, such as:

1. Verifying that the correct data is extracted from Excel.
2. Ensuring that the receipt template is filled accurately.
3. Confirming that the receipts are saved in the correct locations with appropriate filenames.
4. Testing the email functionality to ensure that the emails are sent to the right recipients with the correct attachments.
5. Any errors or issues identified during testing are debugged and resolved to ensure the system's reliability.

F. Error Handling and Exception Management

During the development, exception handling is integrated into the workflow to account for possible errors, such as missing data, incorrect email addresses, or file-saving issues. UiPath's exception-handling activities are used to log errors and either retry the process or notify the user, ensuring that the automation process is robust and reliable.

G. Deployment and Integration

Once the testing phase is successfully completed, the RPA workflow is deployed in a live environment. The system is integrated with the company's existing infrastructure, including access to the necessary folders, email systems, and Excel data sources. Deployment also involves scheduling the automation to run at regular intervals (e.g., daily or weekly) based on business needs.

- [4] KPMG (2020). RPA in Internal Audit: Emerging Trends and Applications. <https://home.kpmg/xx/en/home/insights/2020/06/rpa-internal-audit.html>.
- [5] Deloitte (2019). Robotic Process Automation for Audit: A Game Changer for the Future of Auditing. <https://www2.deloitte.com/insights/us/en/topics/digital-transformation/robotic-process-automation-audit.html>.
- [6] Rozario, A. M., & Vasarhelyi, M. A. (2018). How RPA is Transforming the Auditing Process. *Journal of Emerging Technologies in Accounting*, 15(2), 37–46.
- [7] PWC (2017). The Impact of Automation on Auditing: Moving Forward with RPA. <https://www.pwc.com/gx/en/services/assurance/the-impact-of-automation-on-audit.html>.
- [8] Lacity, M. C., & Willcocks, L. P. (2018). Robotic Process Automation and Risk Mitigation in Auditing. *Journal of Information Technology*, 33(2), 81-98.
- [9] Vijayalakshmi Y, Manimegalai, S S Babu, "Accurate Approach towards Efficiency of Searching Agents in Digital Libraries using Keywords", *Journal of Medical Systems (SPRINGER)* 43:164 <https://doi.org/10.1007/s10916-019-1294-5>, 1st May 2019, *Impact Factor: 5.23 – Q1 Rated Journal*. <https://dl.acm.org/toc/jmsy/2019/43/6>
- [10] Teena Jose, S S Babu – "Detecting Spammers on Social Network Through Clustering Technique", *Journal of Ambient Intelligence and Humanized Computing (SPRINGER)*, pp-1-15, <https://doi.org/10.1007/s12652-019-01541-6>, *Impact Factor: 7.104 (2020) – Q1 Rated Journal*.
- [11] Dijesh P, S S Babu, Yellepeddi Vijayalakshmi – "Enhancement of E-Commerce Security Through Asymmetric Key Algorithm", *Computer Communications, ELSEVIER, Science Direct*, Volume153, Pages 125-134, 2020, <https://doi.org/10.1016/j.comcom.2020.01.033>
- [12] Y. Vijayalakshmi, P. Manimegalai, GKD Prasanna Venkatesan, Dr. S. Sasidhar Babu "Contextual Information Retrieval in Digital Library and Research Over Current Search Engines" *Jour of Adv Research in Dynamical & Control Systems*, Vol. 11, 01- ISSN 1943-023X, 2019, pp 790-793.
- [13] Bindhia K.F, Yellepeddi Vijayalakshmi, Dr.P. Manimegalai & S S Babu, Classification using Decision Tree Approach towards Information Retrieval Keywords Techniques and A Data Mining Implementation using WEKA data set, *International Journal of Pure and Applied Mathematics*, ISSN: 13118080 (pinted version), Volume 116 No. 22 2017, 19-29, ISSN: 1311-8080 (printed version); ISSN: 1314-3395 (on-line version) <http://acadpubl.eu/jsi/2017-116-13-22/issue22.html> <https://www.scopus.com/sourceid/19700182690>
- [14] Yellepeddi Vijayalakshmi, Neethu Natarajan, Dr.P. Manimegalai and Dr. S S Babu, "Study on Emerging Trends In Malware Variants", for publication in *IJPAM International Journal of Pure and Applied Mathematics (SCOPUS)*, ISSN 1314-3395. Volume 116 No. 22 2017 pages 479-489, ISSN: 1311-8080 (printed version); ISSN: 1314-3395(on-lineversion)<http://acadpubl.eu/jsi/2017-116-13-22/issue22.html> <https://www.scopus.com/sourceid/19700182690>
- [15] Neethu Natarajan, Teena Jose, Dr. S S Babu, "Secret Data Hiding Using Image Segmentation and Least Significant BIT (LSB) Insertion Steganography" for publication in *IJPAM International Journal of Pure and Applied Mathematics (SCOPUS)*, ISSN 1314-3395 Volume 117 No. 15, 2017, p.p 527-534, ISSN: 1311-8080 (printed version); ISSN: 1314-3395 (on-line version) <https://www.scopus.com/sourceid/19700182690>
- [16] Hridya V Devaraj, Anju Chandran, Dr. S S Babu "MANET Protocols: Extended ECDSR Protocol for Solving Stale Route Problem and Overhearing" *IEEE proceedings of the 2016 International Conference on Data Mining and Advanced Computing (SAPIENCE)*, 2016. <http://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=7684168> DOI:10.1109/SAPIENCE.2016.7684168
- [17] Divya. D, Dr. S S Babu "Methods to detect different types of outliers" *IEEE proceedings of the 2016, International Conference on Data Mining and Advanced Computing (SAPIENCE)*, 2016 <http://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=7684114> DOI:10.1109/SAPIENCE.2016.7684114 Electronic ISBN: 978-1-4673-8594-7 Print on Demand (PoD) ISBN: 978-1-4673-8595-4
- [18] Sajay K.R, Dr. S S Babu "A Study of Cloud Computing Environments for High Performance

- Applications”, IEEE proceedings of the 2016 International Conference on Data Mining and Advanced Computing (SAPIENCE), 2016. <http://ieeexplore.ieee.org/document/7684127/> DOI: 10.1109/SAPIENCE.2016.7684127, Electronic ISBN: 978-1-4673-8594-7 Print on Demand (PoD) ISBN: 978-1-4673-8595-4
- [19] Teena Jose, Vijayalakshmi, Yellepeddi, Dr. Sasidhar Babu Suvanam and Dr. Mani Megalai “Cyber Crimes in India: A Study”, IEEE proceedings of the SCOPES 2016. Date Added to IEEE Xplore: 26 June 2017 DOI: 10.1109/SCOPES.2016.7955584 <http://ieeexplore.ieee.org/document/7955584/> Pages: 960 – 965
- [20] Vishwanath Y., Kiran Desai, R S Upendra, Venkatesh Prasad, Sasidhar Babu Suvanam, Arun Biradar, Supreeth S., Rohith S., “ Performance Evaluation of Integrated Hard Real-Time Application and RISC V Processor for Spacecraft on Board Software Application” , International Journal of Intelligent Systems and Applications in Engineering, ISSN: 2147 – 6799, IJISAE, 2023, 11(3), 810817|810817. <https://ijisae.org/index.php/IJISAE/article/view/3287>
- [21] palagiri Mohammad Reehan, Nikhilesh, Revanth, Venkata Vikas Chandra, Sasidhar Babu Suvanam “Disease Prediction and Medicine Recommendation System”, AIP Conf. Proc. 2742, 020089-1–020089-17; Published by AIP Publishing. 978-0-7354-4849-0/\$30.00, Pages: 020089-1 to 020089-17. DOI: <https://doi.org/10.1063/5.0184521> <https://pubs.aip.org/aip/acp/article/2742/1/020089/3263662/Disease-prediction-and-medicine-recommendation>
- [22] Santhosh, Ganga D Benal, “Fatigue Detection for Drivers Using Face Object Features Based on Aspect Ratio of Eyes and Mouth” AIP Conf. Proc. 2742, 020042-1–020042- 8; Published by AIP Publishing. 978-0-7354-4849-0/\$30.00, Pages: 020042-1 to 020042-8. DOI: <https://pubs.aip.org/aip/acp/article/2742/1/020042/3263613/Fatigue-detection-for-drivers-using-face-object>
- [23] Keerthana, Sasidhar Babu Suvanam, Vijayalakshmi Yellepeddi, “Radical Sound Valuation of Fetal Weight with the Use of Deep Learning”, AIP Conf. Proc. 2742, 020044-1–020044-10; Published by AIP Publishing. 978-0-7354-4849-0/\$30.00, Pages: 020044-1 to 020044-10. DOI: <https://doi.org/10.1063/5.0184155> <https://pubs.aip.org/aip/acp/article/2742/1/020044/3263651/Radical-sound-valuation-of-fetal-weight-with-the>
- [24] K. R. Pruthvi Kumar, Anjan K. Koundinya, S. Harsha, G. S. Nagaraja, and Sasidhar Babu Suvanam, “ A Cognitive Comparative Analysis of Geometric Shape-Based Cryptosystem”, Fourth Congress on Intelligent Systems, Volume-1, ISSN 2367-3370 ISSN 2367-3389 (electronic) Lecture Notes in Networks and Systems, March 2024, pages: 51-62, DOI: https://doi.org/10.1007/978-981-99-9037-5_5