# EXPENSE REIMBURSEMENT AUTOMATION

## A PROJECT REPORT

*Submitted by*

## DIVYA SUNDHARI S M (220701068)

*in partial fulfillment for the course*

## OAI1903 - INTRODUCTION TO ROBOTIC PROCESS AUTOMATION

*for the degree of*

## BACHELOR OF ENGINEERING

## in

## COMPUTER SCIENCE AND ENGINEERING

## RAJALAKSHMI ENGINEERING COLLEGE
## RAJALAKSHMI NAGAR
## THANDALAM
## CHENNAI – 602 105

## NOVEMBER 2023

# RAJALAKSHMI ENGINEERING COLLEGE

# CHENNAI - 602105

## BONAFIDE CERTIFICATE

Certified that this project report **"Expense Reimbursement Automation"** is the bonafide

work of "**Divya Sundhari S M**" who carried out the project work for the subject OAI1903-

Introduction to Robotic Process Automation under my supervision.

**Mrs. J. Jinu Sophia, M.E. (Ph.D.),**

Assistant Professor (SG),

Department of

Computer Science and Engineering

Rajalakshmi Engineering College

Rajalakshmi Nagar

Thandalam

Chennai - 602105

Submitted to Project and Viva Voce Examination for the subject OAI1903-

Introduction to Robotic Process Automation held on _____.

# ABSTRACT

Expense reimbursement automation project aims to develop an automated expense reimbursement system using UiPath, enabling seamless handling of receipts, saving the receipts information, and reviewing it by the manager, and notifying the employee about the completion of transaction by the Finance department. The process begins with employees submitting their expense receipts as PDF documents, which are automatically processed by UiPath robots to extract relevant data and populate a shared Excel sheet. Managers are promptly notified of new submissions, enabling them to review the details and update the status. Once reviewed, UiPath workflows forward the receipts to the finance department for payment processing. This automated workflow reduces manual intervention, minimizes errors, and accelerates the reimbursement cycle.

The finance department processes the payments and updates the transaction status in the Excel sheet, while UiPath ensures employees receive timely notifications about the status of their reimbursements. UiPath ensures employees receive timely notifications about the status of their reimbursements. By leveraging robotic process automation (RPA) through UiPath, this project ensures transparency, accuracy, and efficiency across all stages of expense management.

# ACKNOWLEDGEMENT

Initially we thank the Almighty for being with us through every walk of our life and showering his blessings through the endeavor to put forth this report. Our sincere thanks to our Chairman **Thiru. S. Meganathan, B.E, F.I.E.,** our Vice Chairman **Mr. Abhay Shankar Meganathan, B.E., M.S.,** and our respected Chairperson **Dr. (Mrs.) Thangam Meganathan, M.A., M.Phil., Ph.D,** for providing us with the requisite infrastructure and sincere endeavoring in educating us in their premier institution.

Our sincere thanks to **Dr. S.N. Murugesan, M.E., Ph.D.,** our beloved Principal for his kind support and facilities provided to complete our work in time. We express our sincere thanks to **Dr. P.Kumar, M.E., Ph.D.,** Professor and Head of the Department of Computer Science and Engineering for his guidance and encouragement throughout the project work. We convey our sincere and deepest gratitude to our internal guides, **Mrs. J. Jinu Sophia, M.E., (Ph.D.),** Assistant Professor (SG), Department of Computer Science and Engineering, Rajalakshmi Engineering College for their valuable guidance throughout the course of the project. We are very glad to thank our Project Coordinators, **Dr. N. Durai Murugan, M.E., Ph.D.,** Associate Professor, and **Mr. B. Bhuvaneswaran, M.E.,** Assistant Professor (SG), Department of Computer Science and Engineering for their useful tips during our review to build our project.

**Divya Sundhari S M (220701068)**

# TABLE OF CONTENTS

# LIST OF FIGURES

# CHAPTER 1

# INTRODUCTION

## 1.1 GENERAL

Expense reimbursement is a crucial process in organizations, ensuring employees are compensated for expenses incurred during official duties. Traditional reimbursement systems often rely on manual data entry, validation, and communication, which are time-consuming and prone to errors. This can lead to inefficiencies, delays, and employee dissatisfaction. Automation of this process using tools like UiPath helps eliminate these challenges by streamlining workflows, improving accuracy, and reducing manual intervention.

This project focuses on developing an automated expense reimbursement workflow. The system extracts expense data from PDF receipts, validates the information against predefined conditions, stores it in an Excel file, and sends email notifications to employees about the status of their claims. By automating repetitive tasks, the proposed system not only saves time but also enhances the transparency and reliability of the reimbursement process.

## 1.2 OBJECTIVE

The main objective of the expense reimbursement process is to efficiently and accurately reimburse employees for legitimate business-related expenses incurred during their job duties, while ensuring compliance with company policies and budgetary constraints.

The process aims to streamline the submission, approval, and payment workflows, reduce administrative overhead, minimize errors, and enhance transparency in financial transactions. By automating and standardizing the process, organizations can achieve faster processing times, improve employee satisfaction, and maintain financial integrity through accurate record-keeping and compliance with tax and audit regulations.

## 1.3 EXISTING SYSTEM

Current systems involve manual data entry, validation, and communication processes that are labor-intensive, error-prone, and inefficient. Employees often face delays in receiving reimbursements due to these challenges.

## 1.4 PROPOSED SYSTEM

The proposed system automates the reimbursement workflow by leveraging UiPath's capabilities to extract data from PDFs, validate it using conditions, store it in a structured format (Excel), and notify employees via email. This system reduces manual effort, improves accuracy, and ensures timely communication.

# CHAPTER 2

# LITERATURE REVIEW

## 2.1 Survey on Robotic Process Automation (RPA) in Expense Reimbursement Automation:

Robotic Process Automation (RPA) is transforming various organizational workflows, including finance and HR processes, by automating repetitive tasks and improving operational efficiency. RPA is particularly beneficial in expense reimbursement systems by reducing the dependency on manual processing, ensuring accuracy, and accelerating the reimbursement life cycle. Below is a review of research papers related to the application of RPA in expense reimbursement systems:

[1] A research paper from Journal of Finance Automation discusses how RPA can optimize financial workflows, including expense management. The study highlights that manual processes, such as reviewing expense claims and validating receipts, are prone to delays and errors. By implementing RPA, organizations can automate data extraction from receipts, validate compliance with company policies, and trigger approvals or rejections. The research concludes that RPA significantly reduces processing time and improves employee satisfaction.

[2] A study from IJRPA explores an RPA solution for managing corporate expense reimbursements. The paper focuses on extracting data from PDF receipts, validating it against predefined business rules, and storing it in structured formats like Excel or databases. The study showcases the use of automation tools such as UiPath to streamline communication by sending status updates to employees. The researchers note that this approach minimizes human effort and improves the transparency and reliability of reimbursement workflows.

[3] Research published in IEEE Transactions on Automation Science emphasizes the role of RPA in handling large volumes of expense claims in multinational organizations. It describes an RPA framework that integrates with existing ERP systems to automate end-to-end workflows, including expense tracking, compliance checks, and report generation. The study concludes that RPA not only improves efficiency but also ensures better compliance with regulatory standards.

These studies collectively demonstrate the growing relevance of RPA in expense reimbursement systems, addressing inefficiencies in manual processes and paving the way for smarter, automated workflows.

# CHAPTER 3

# SYSTEM DESIGN

## 3.1 SYSTEM FLOW DIAGRAM

A flowchart is a type of diagram that represents an algorithm, workflow or process. The flowchart shows the steps as boxes of various kinds, and their order by connecting the boxes with arrows. This diagrammatic representation illustrates a solution model to a given problem. The system flow diagram for this project is in Fig. 3.1.
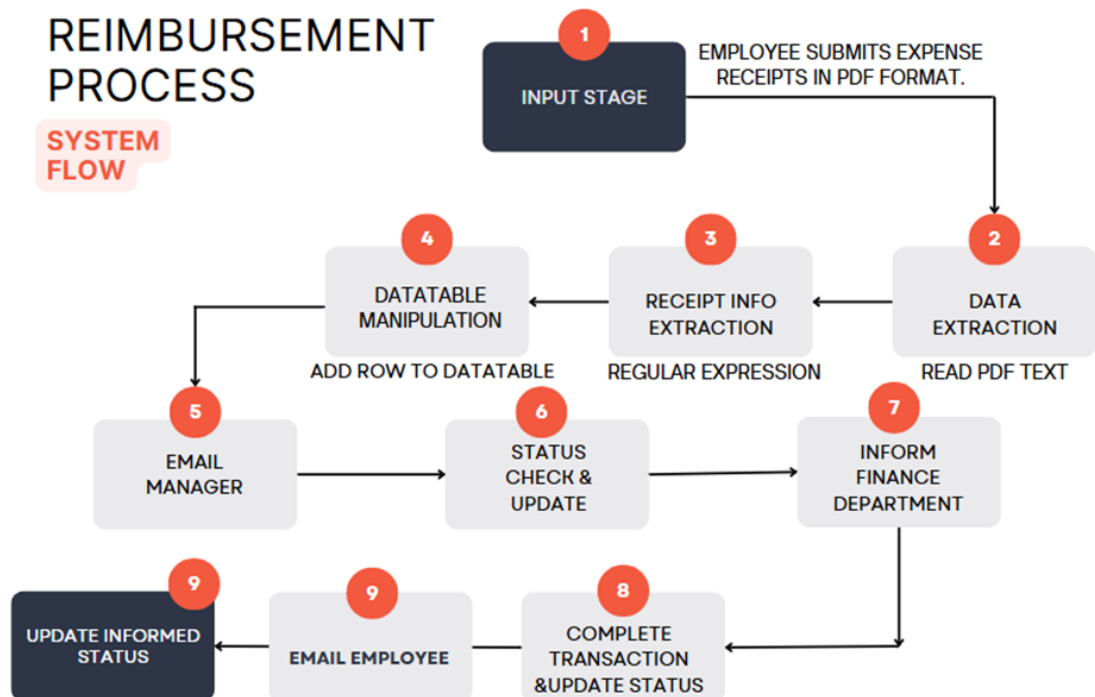
Fig 3.1 System Flow Diagram

## 3.2    ARCHITECTURE DIAGRAM

An architecture diagram is a graphical representation of a set of concepts, that are part of an architecture, including their principles, elements and components. The architecture diagram for this project is in Fig. 3.2.
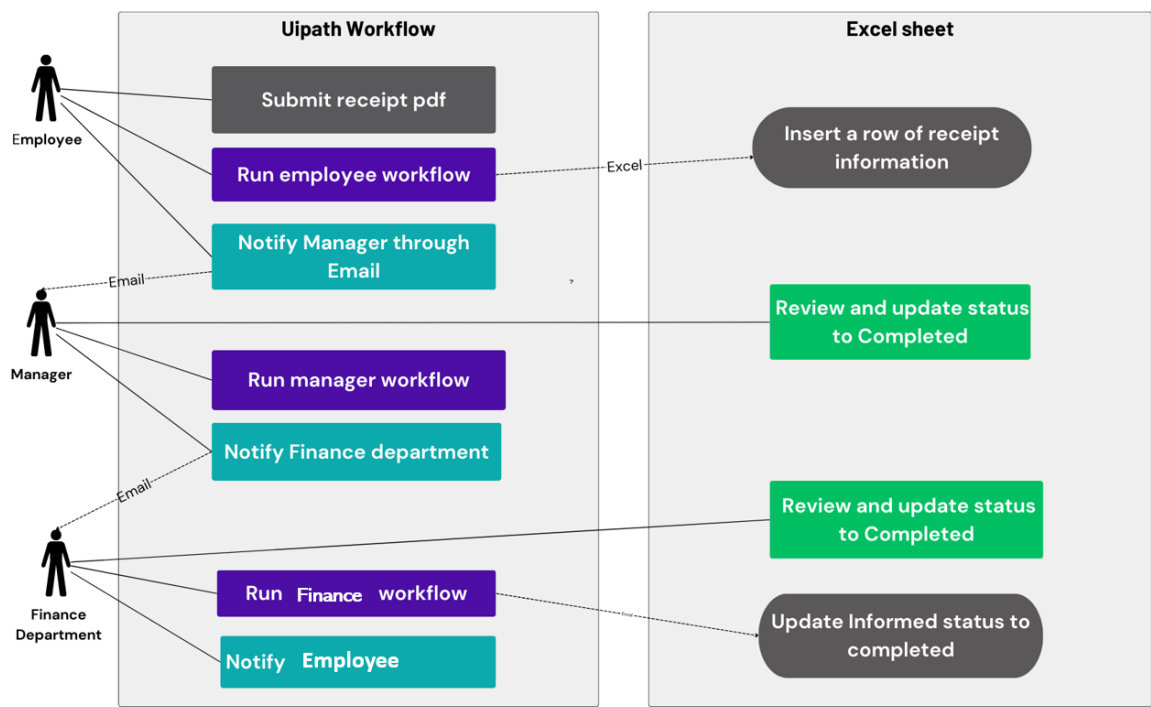


Fig 3.2 Architecture Diagram

## 3.3  SEQUENCE DIAGRAM

A sequence diagram is a type of interaction diagram because it describe and s how in what order a group of objects works together. The sequence diagram for this project is in Fig. 3.3.
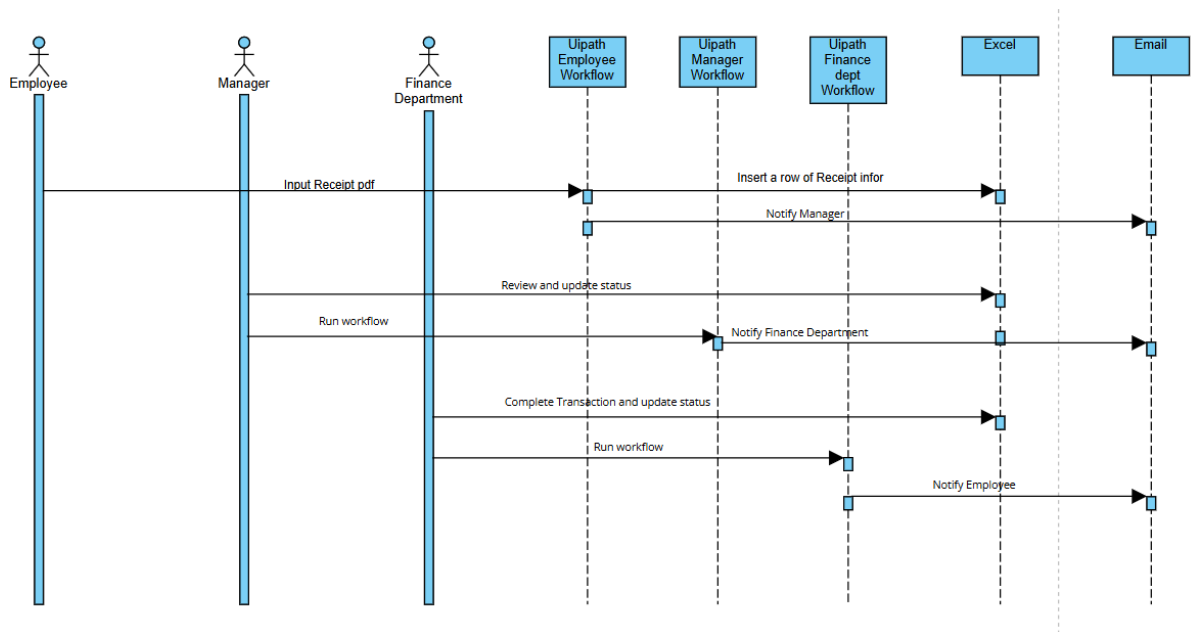


Fig 3.3 Sequence Diagram

# CHAPTER 4

# PROJECT DESCRIPTION

## 4.1 METHODOLOGIES

The methodology for the expense reimbursement automation project is structured into three main workflows: Employee Workflow, Manager Workflow, and Finance Department Workflow. The Employee Workflow begins with employees submitting expense receipts in PDF format, followed by automated data extraction using UiPath's Read PDF Text and Regex activities.

The extracted data is validated against predefined conditions and stored in an Excel file. In the Manager Workflow, submitted claims are reviewed by iterating through the Excel file using For Each Row, where the "Review Status" and "Transaction Status" are checked, and the manager approves or rejects the claims.

The Finance Department Workflow consolidates approved claims, generates reimbursement reports, and processes payments while updating the status in the system. Each workflow leverages UiPath's automation tools, such as data validation, Excel operations, and email notifications, ensuring accuracy, efficiency, and timely communication across the process.

### PACKAGES REQUIRED:

- **UiPath.PDF.Activities**: For extracting data from PDF files, such as receipts and invoices.

- **UiPath.Excel.Activities**: To handle Excel operations like storing, updating, and reviewing expense data.

- **UiPath.Mail.Activities**: For sending email notifications to employees and stakeholders regarding reimbursement statuses.

- **UiPath.System.Activities**: For executing fundamental automation tasks, such as file operations and exception handling.

- **UiPath.UIAutomation.Activities**: For interaction with user interfaces during automated workflows.

## ACTIVITIES USED:

The following UiPath activities are used to implement the project workflow:

1. **Input Dialog**: For accepting inputs such as employee details or file paths.

2. **Read PDF Text**: For extracting text data from PDF receipts.

3. **Regex Matches**: For identifying and extracting specific patterns like dates, amounts, or receipt numbers.

4. **Build Data Table**: For creating a structured format to store extracted data.

5. **Add Data Row**: For appending validated data into the data table.

6. **Write Range**: To save the data table into an Excel file for record-keeping.

7. **For Each Row in Data Table**: For iterating through expense claims in the Excel file.

8. **If Condition**: For validating and checking statuses such as "Review Status" and "Transaction Status."

9. **Append Range**: To add new data to an existing Excel sheet without overwriting it.

10. **Send SMTP Mail Message**: For notifying employees about the reimbursement status or requesting additional details.

11. **Log Message**: To record logs of the automation process for auditing and debugging.

12. **Try Catch**: For handling errors and ensuring the workflow completes smoothly.

### 4.1.1  MODULES:

### 4.1.1.1. Employee Workflow

**Input Module**

Employees submit expense receipts in PDF format via the system interface.

**Data Extraction Module**

Extracts relevant data such as dates, amounts, and expense categories from PDF files using UiPath's Read PDF Text and Regex activities.

**Data Validation Module**

Validates the extracted data against predefined conditions, including checking for mandatory fields, acceptable expense limits, and policy compliance using string manipulation techniques.

**Data Storage Module**

Stores the validated expense data in a structured Data Table and saves it in an Excel file using the Excel Application Scope activity.

**Notification Module**

Sends an email to employees with the status of their submitted claims, such as "Under Review" or "Approved," using the Send SMTP Mail Message activity.

### 4.1.1.2. Manager Workflow:

**Input Module**

The manager accesses the submitted claims stored in an Excel file, containing details like claim amount, category, and status.

**Review Module**

Iterates through the rows in the Excel file using For Each Row, checking "Review status" and "Transaction status" columns to identify claims requiring manager action.

**Decision Module**

Managers review the claims and update the status as "Approved" or

"Rejected" based on the validation and compliance checks.

**Data Update Module**

Updates the Excel sheet with the manager's decision and marks the claims as reviewed.

**Notification Module**

Sends email notifications to employees with the manager's decision (e.g., "Claim Approved" or "Claim Rejected") using the Send SMTP Mail Message activity.

### 4.1.1.3. Finance Department Workflow:

**Input Module**

Accesses approved claims flagged for processing in the Excel file.

**Summarization Module**

Consolidates all approved claims into a report summarizing reimbursement details for processing.

**Processing Module**

Prepares reimbursement files by automating calculations and updating financial records in the company's systems.

**Reimbursement Module**

Finalizes the payment process and updates the Excel file with the transaction details, marking claims as "Completed."

**Notification Module**

Sends final email notifications to employees confirming their reimbursement completion and transaction details.

# CHAPTER 5

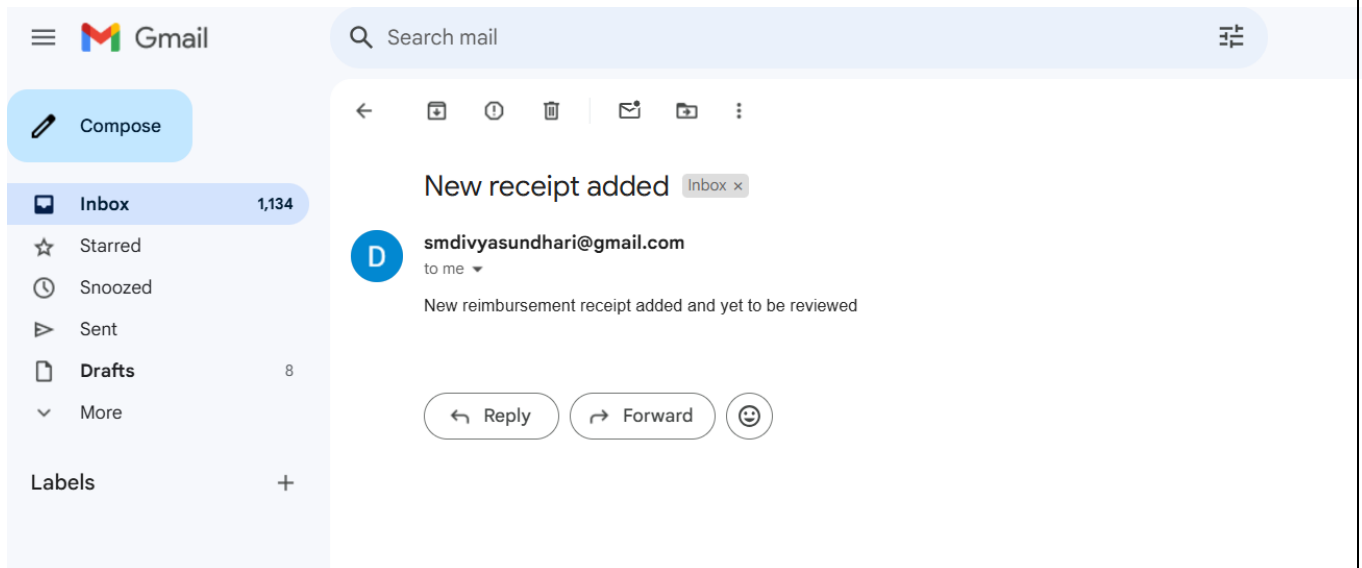# OUTPUTS



Fig 5.1 – Excel Sheet



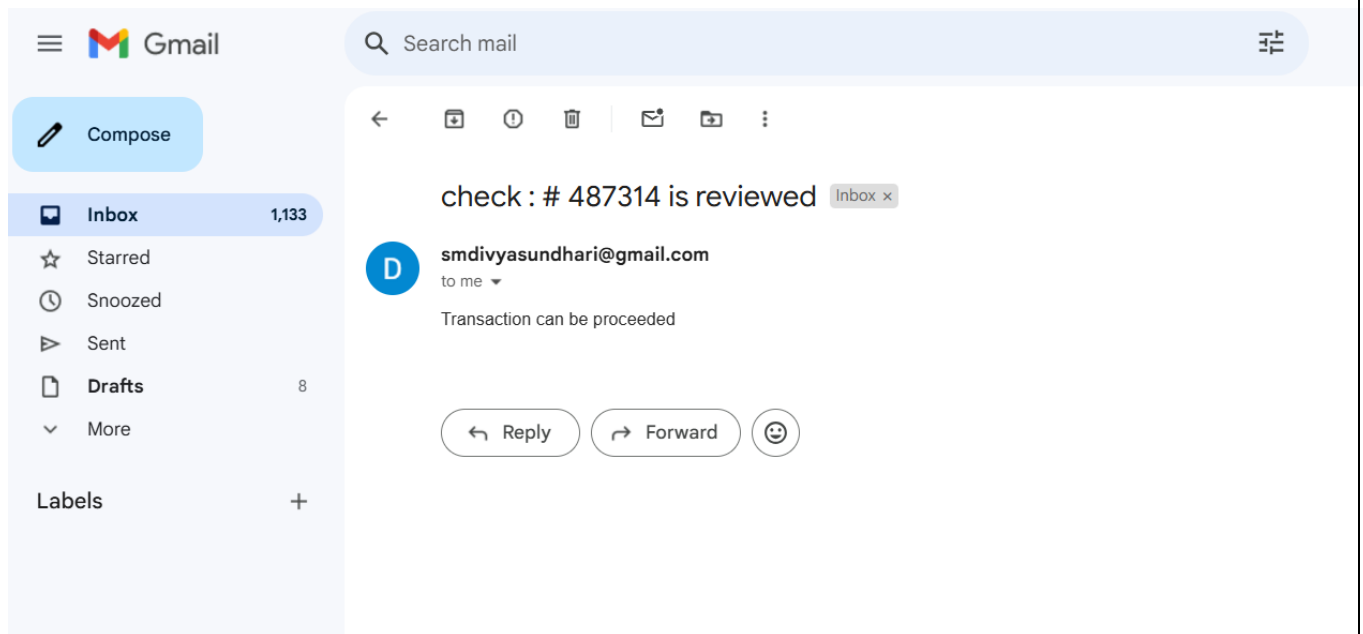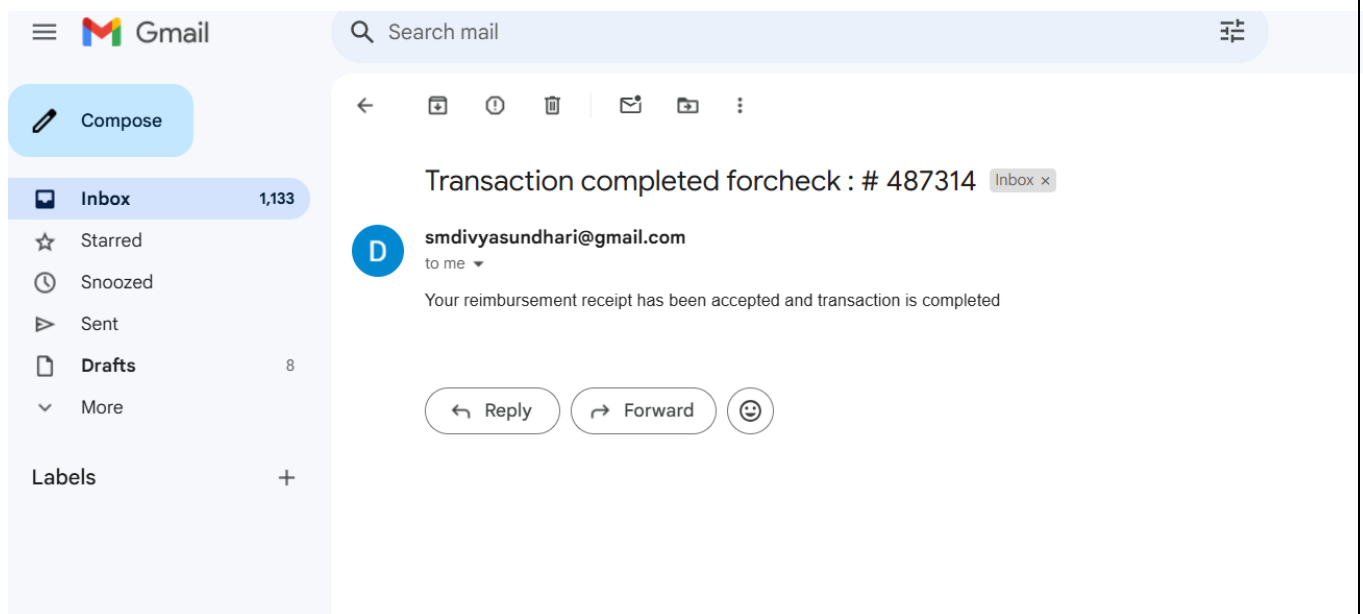Fig 5.2 – Manager mail

Fig 5.3 – Finance Mail



Fig 5.4 – Employee Mail

# CHAPTER 6

# CONCLUSION

In conclusion, the expense reimbursement automation project effectively streamlines the reimbursement process by leveraging UiPath's capabilities to automate data extraction, validation, storage, review, and communication. By eliminating manual effort, the system reduces errors, improves processing efficiency, and ensures timely updates to employees regarding their claims. The implementation of automated workflows for employees, managers, and the finance department not only enhances accuracy and transparency but also optimizes resource utilization. This project demonstrates how Robotic Process Automation (RPA) can transform traditionally manual processes into efficient, scalable, and reliable systems, offering significant value to organizations in managing expense reimbursements.
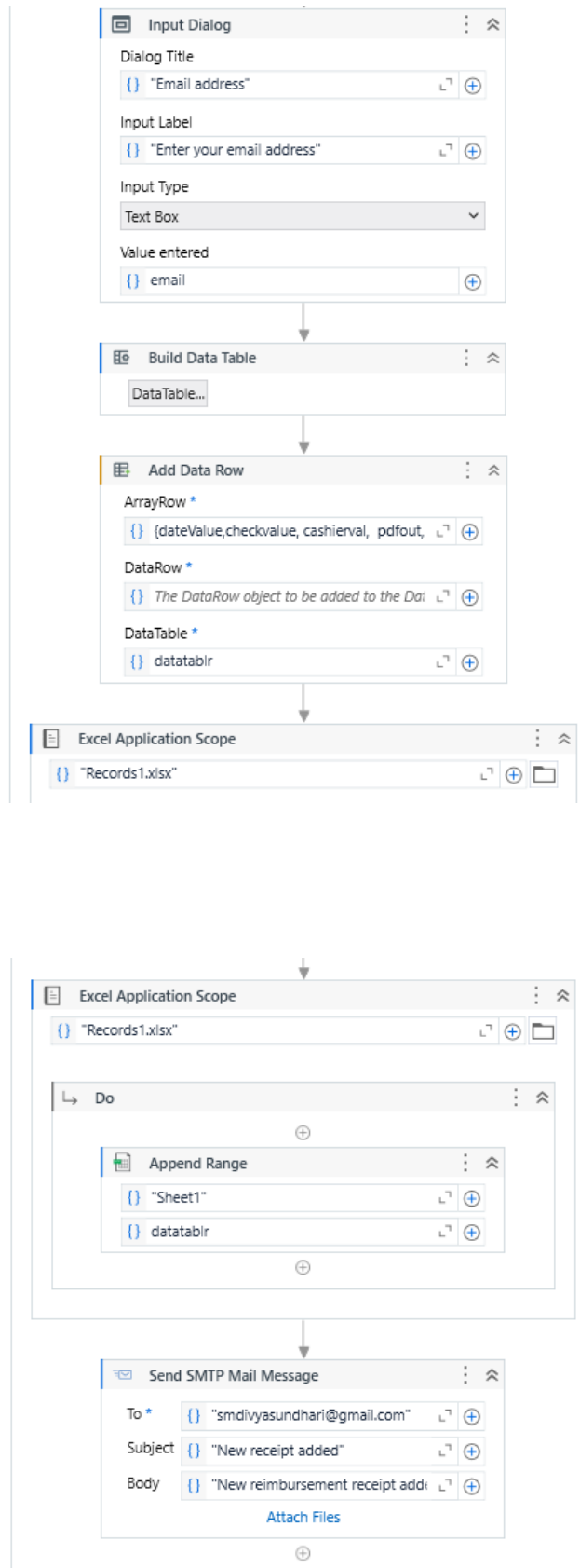
# APPENDIX

# PROCESS FLOW
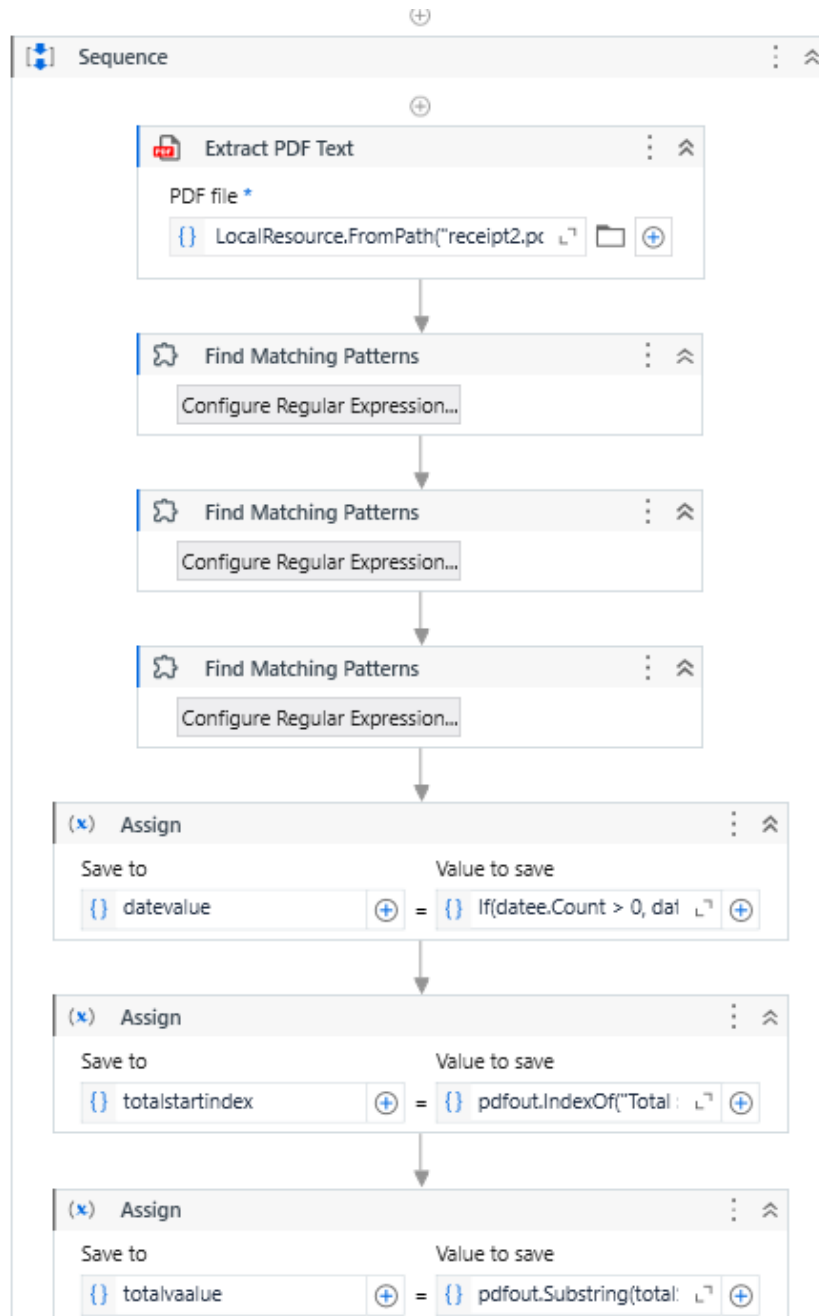
Fig 5.5 – Employee Workflow

Address Here

# Table - 06

Check #:    714259           Pax(s): 01
Date    :   10/28/2024    18:58
Cashier:    Pallavi Vandhana

-------------------------------------------------

| 1 | Printer Paper (500 sheets) | 500.00 |
| 1 | Printer Ink Cartridge | 345.00 |
| 1 | Stapler | 50.00 |
| 1 | Staple Pins (pack of 100) | 200.00 |
| 1 | Disinfectant Wipes (pack of 80) | 450.00 |
| 1 | Tea Bags (box of 100) - $7 | 300.00 |

-------------------------------------------------

Subtotal :                          1845.00

# Total :              1845.00

-------------------------------------------------
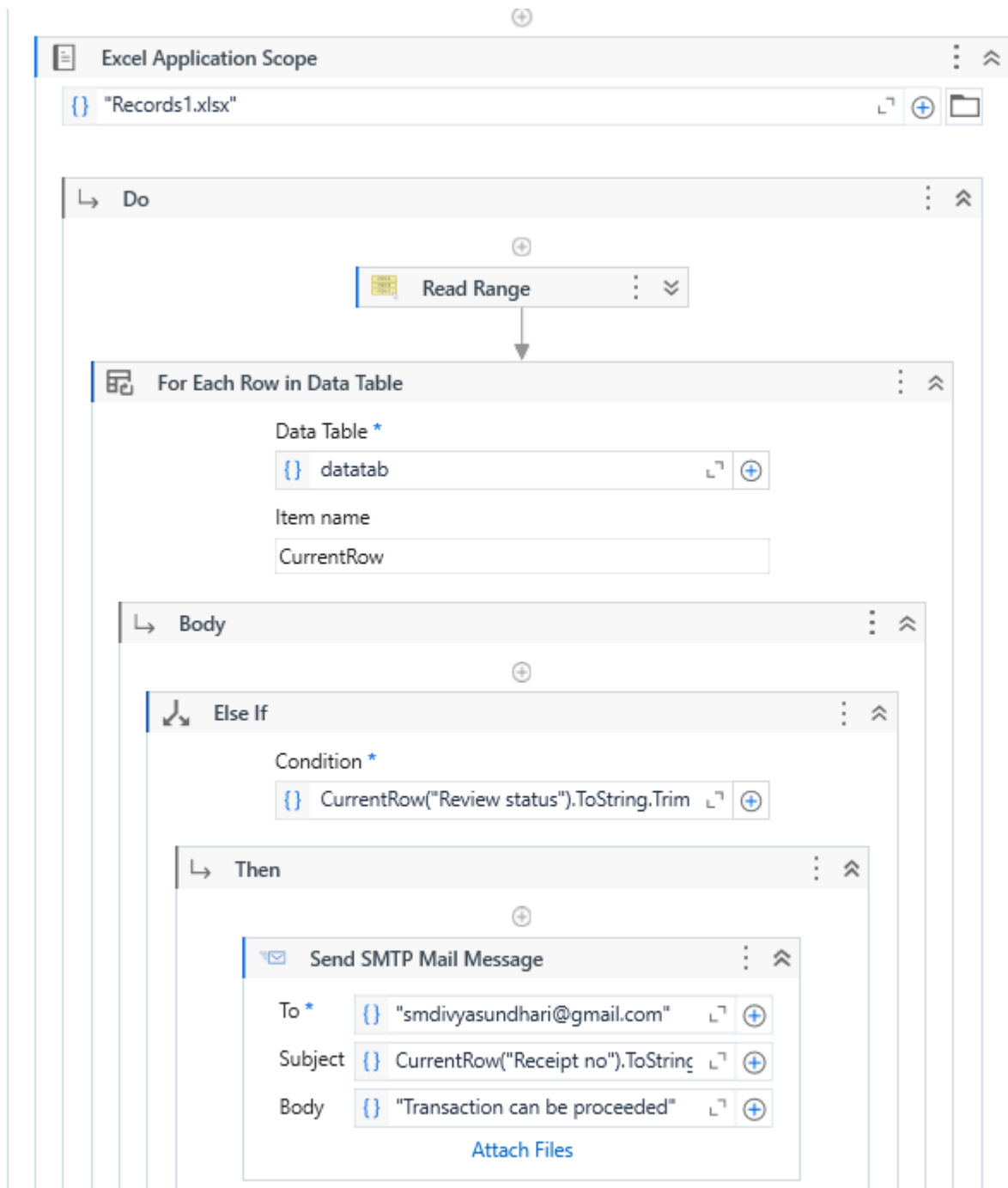
Thank You!

Fig 5.6 Receipt Pdf

Fig 5.7 – Manager Workflow
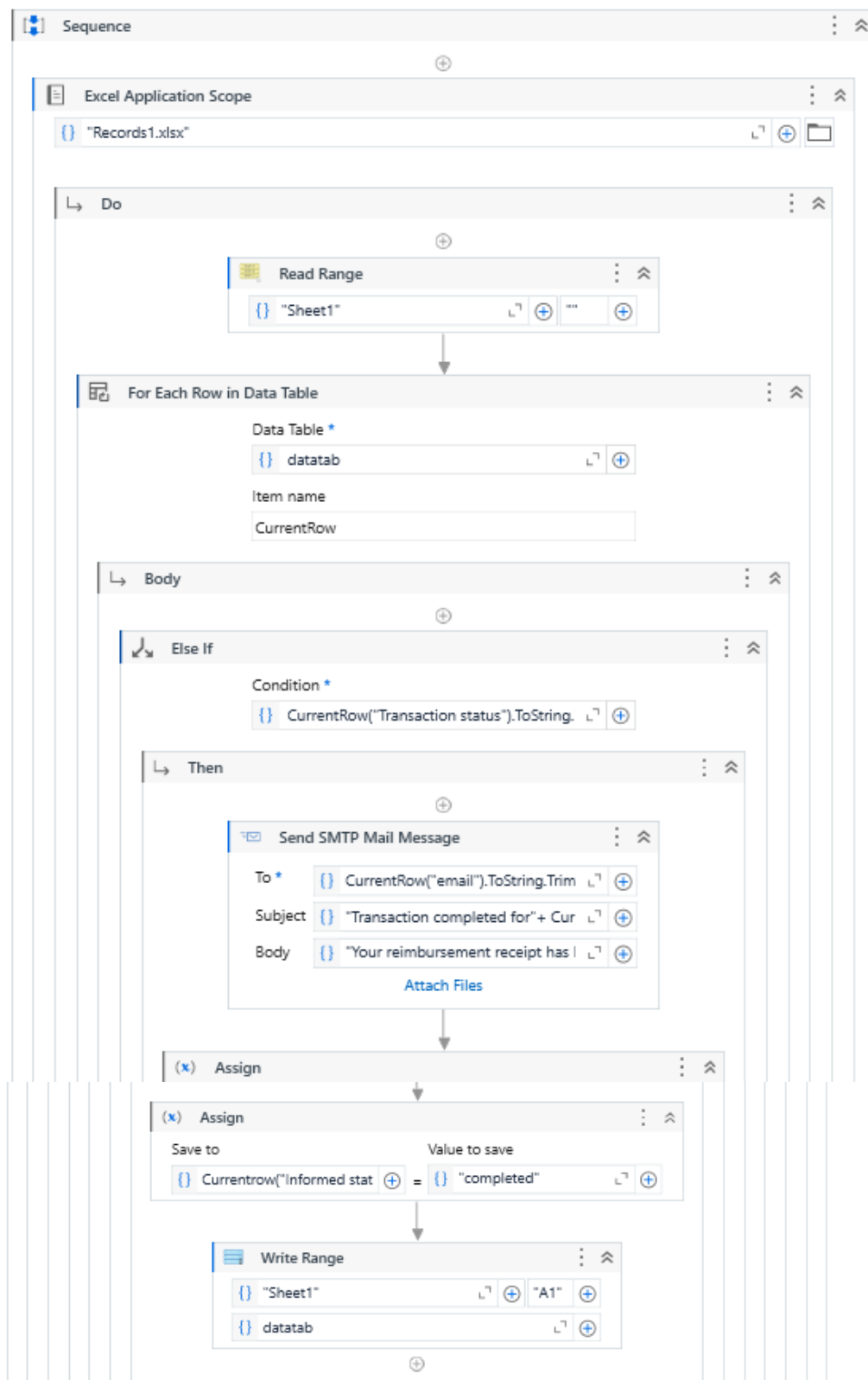
Fig 5.8 Finance Department Workflow

F

| + | Date (String) × 🖊 | Receipt No (String) × 🖊 | Name (String) × 🖊 | Receipt info (String) × 🖊 | Total (String) × 🖊 | Review status (String) × 🖊 | Transaction Status (String) × 🖊 | Informed Status (String) × 🖊 | email (String) × 🖊 |
|---|---|---|---|---|---|---|---|---|---|
| × | | | | | | | | | |

OK     Cancel

Fig 5.9 - Datatable

# REFERENCES

[1] Kuppusamy, Palanivel & Joseph K, Suresh. (2020). Automating Expense Reimbursement Processes with Robotic Process Automation. 3775.

[2] Patil, Dr & Mane, Vinod & Patil, Dr. (2019). Transforming Business Processes through Robotic Process Automation (RPA). International Journal of Innovative Technology and Exploring Engineering. 8. 3757-3760. https://doi.org/10.35940/ijitee.K2148.0981119.

[3] Elkhatat, A.M., Elsaid, K. & Almeer, S. Implementing RPA for Business Process Optimization: Case Studies and Applications. Int J Bus Autom 19, 17 (2023). https://doi.org/10.1007/s40979-023-00140-5.

[4] H. Alamleh, A. A. S. AlQahtani and A. ElSaid, "Enhancing Financial Workflows Using Robotic Process Automation," 2023 Systems and Information Engineering Design Symposium (SIEDS), Charlottesville, VA, USA, 2023, pp. 154-158. https://doi.org/10.1109/SIEDS58326.2023.10137767.

[5] Tomáš Foltýnek, Norman Meuschke, and Bela Gipp. 2019. Robotic Process Automation in Data Management: A Systematic Literature Review. ACM Comput. Surv. 52, 6, Article 112 (November 2020), 42 pages. https://doi.org/10.1145/3345317.

[6] H. A. Chowdhury, D. K. Bhattacharyya. "Automation in Financial Systems: Taxonomy, Tools, and Techniques," 19th National Convention on Business Process Automation, 2018.