AUTOMATED REVENUE ANALYZER

A PROJECT REPORT

Submitted by

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OAI1903 - INTRODUCTION TO ROBOTIC PROCESS AUTOMATION

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BACHELOR OF ENGINEERING

in

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THANDALAM
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RAJALAKSHMI ENGINEERING COLLEGE

CHENNAI - 602105

BONAFIDE CERTIFICATE

Certified that this project report **"AUTOMATED REVENUE ANALYZER"** is the bonafide work of **"SANJANA SHREE S (220701245)"** who carried out the project work for the subject OAI1903-Introduction to Robotic Process Automation under my supervision.

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Submitted to Project and Viva Voce Examination for the subject OAI1903-Introduction to Robotic Process Automation held on _____.

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Sanjana Shree S (220701245)

ABSTRACT

The project **AUTOMATED REVENUE ANALYZER** is designed to revolutionize financial data processing by automating the classification and analysis of customer payment data. Traditional manual methods of segregating payment details by mode, calculating totals, and summarizing income are often prone to errors and inefficiencies, consuming valuable time and resources. This project leverages Robotic Process Automation (RPA) through UiPath Studio to streamline these tasks.

The solution begins by extracting customer payment data from an input dataset, segregating it into separate Excel files for each payment mode (e.g., Credit Card, UPI, Net Banking). The RPA workflow then calculates the total transaction amount for each mode and aggregates the income across all modes. The final results are displayed as a consolidated summary, ready for financial reporting and analysis.

This automated approach not only eliminates repetitive manual tasks but also significantly improves accuracy, reduces processing time, and ensures the availability of up-to-date financial summaries. It is scalable to handle large datasets and can be adapted for various organizational needs, making it an indispensable tool for financial operations. By integrating automation, this project paves the way for smarter, more efficient financial management systems, enabling faster decision-making and enhanced productivity.

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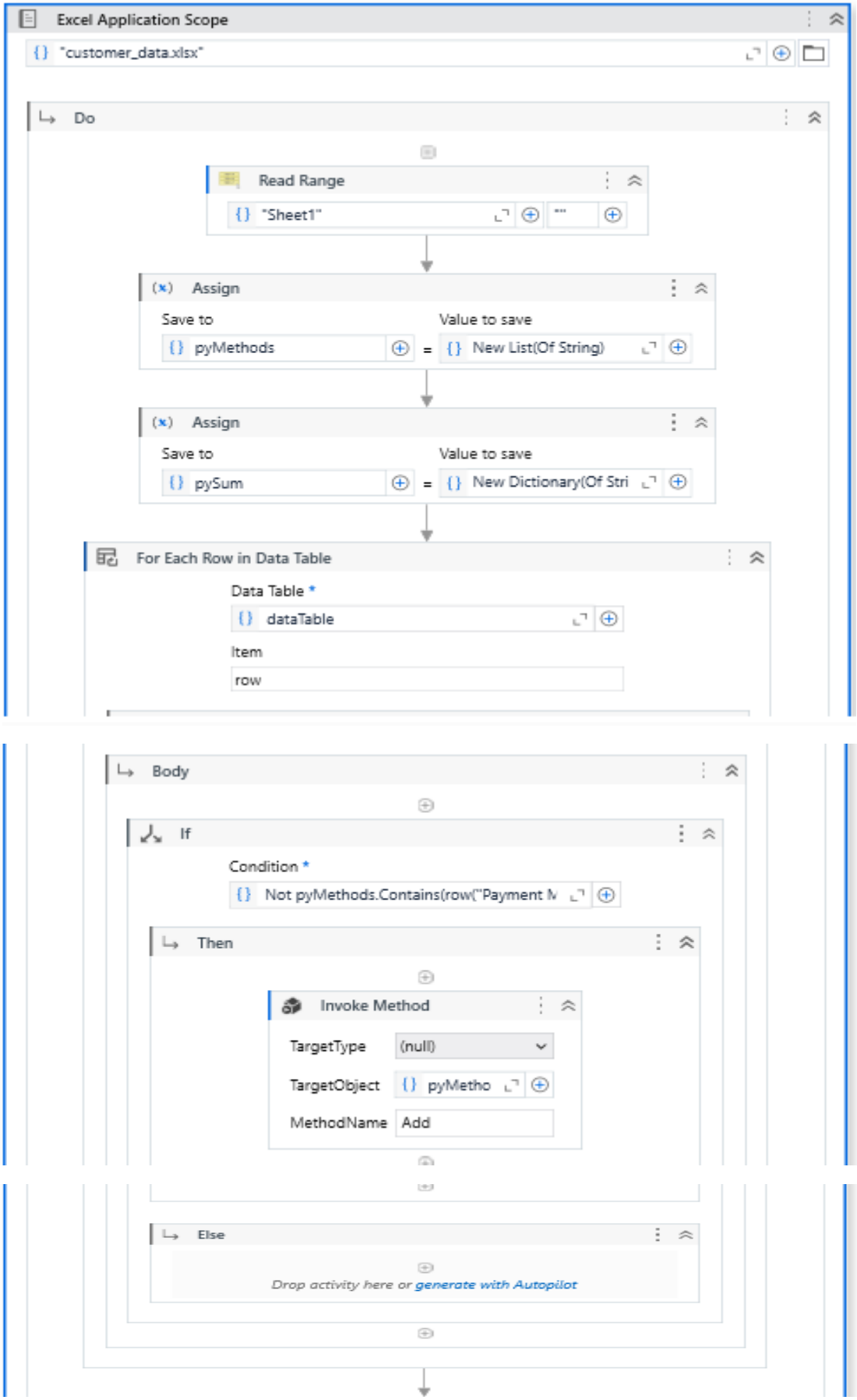
Features of the Automated Revenue Analyzer

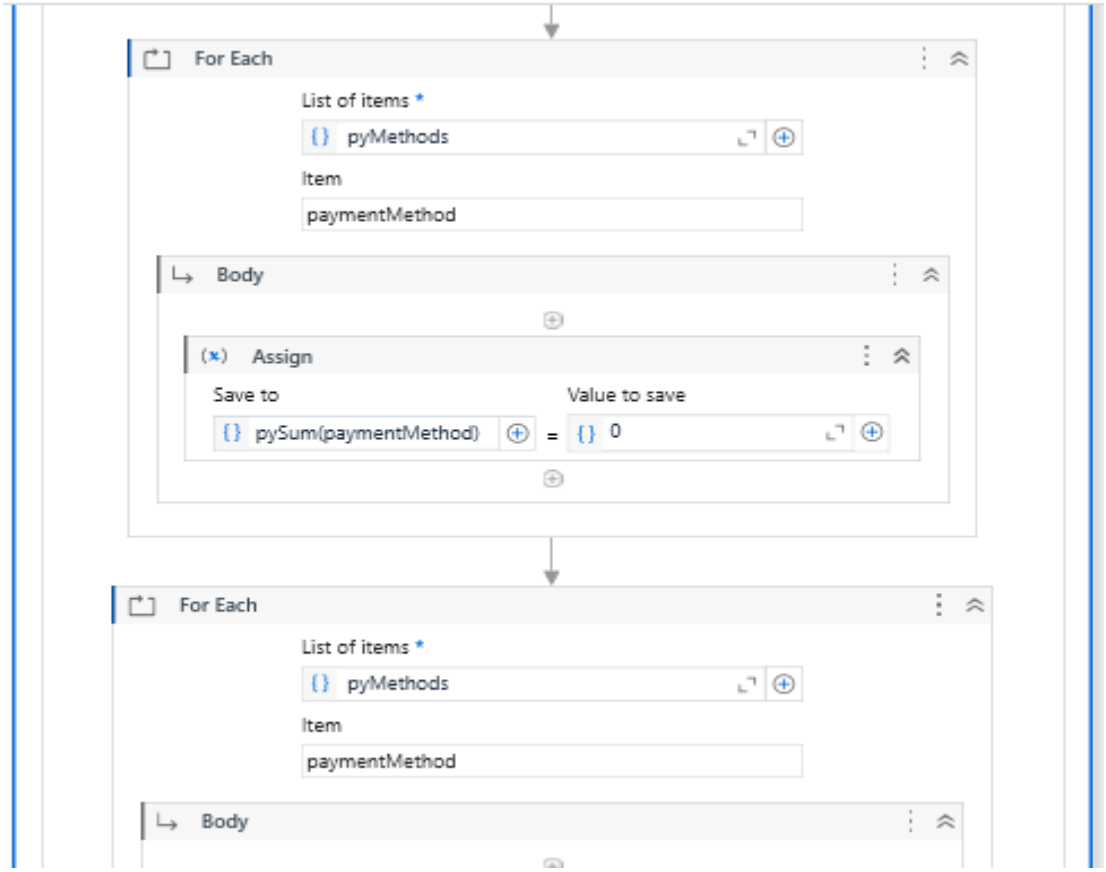
Feature	Description	Purpose
Payment Mode Segregation	Reads customer payment data from an Excel sheet and categorizes transactions by payment modes (e.g., Credit Card, UPI, Cash).	Organizes transactions for targeted analysis.
Automated Revenue Calculation	Computes the total revenue for each payment mode.	Provides an accurate financial summary.
Data Consolidation	Aggregates payment mode totals into a single summary.	Facilitates decision-making with consolidated insights.
Excel Report Generation	Generates updated Excel files for each payment mode and a comprehensive summary report for overall transactions.	Summarizes business transactions in a readable format.
Error Handling	Ensures smooth operation by logging and notifying in case of incomplete or invalid data entries.	Maintains process reliability and transparency.

Workflow Activities of the Automated Revenue Analyzer

Step No	Activity	Description	Tools/Features Used
1	Read Payment Data	Extract customer payment data (payment mode, transaction amount) from an Excel sheet.	Excel Application Scope, Read Range
2	Segregate Payment Modes	Categorize data by payment modes (e.g., Credit Card, UPI, Cash).	Filter Data Table, For Each Row
3	Calculate Total Amount	Compute the total transaction amount for each payment mode.	Assign, Excel Formula
4	Generate Mode-Specific Files	Create separate Excel files for each payment mode with corresponding transactions.	Write Range Activity
5	Aggregate Income	Summarize the total income across all payment modes.	Assign, Summation Formula
6	Save Consolidated Report	Store the summarized report with total revenue for easy access.	Write Cell Activity
7	Display Final Results	Display the total income across all payment modes in a message box.	Message Box Activity

LIST OF FIGURES




For Each
List of items *
pyMethods
Item
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=
0
For Each
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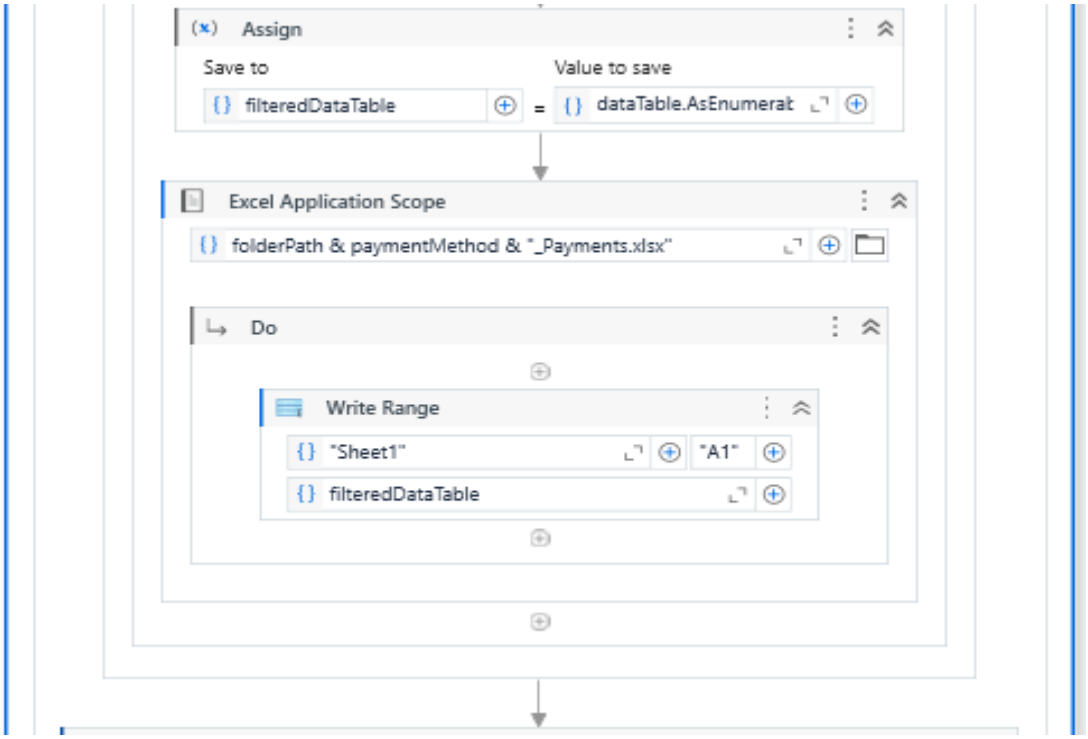
pyMethods
Item
paymentMethod
Body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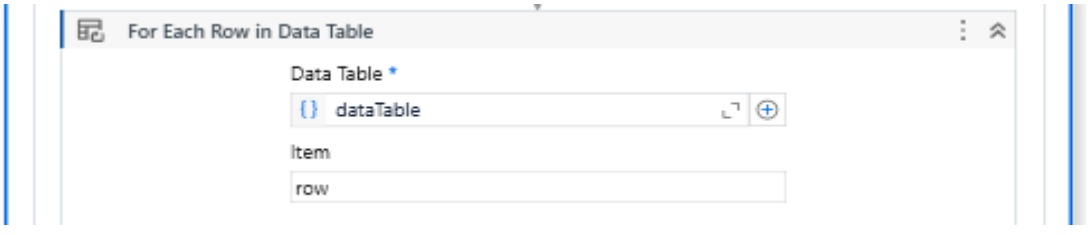
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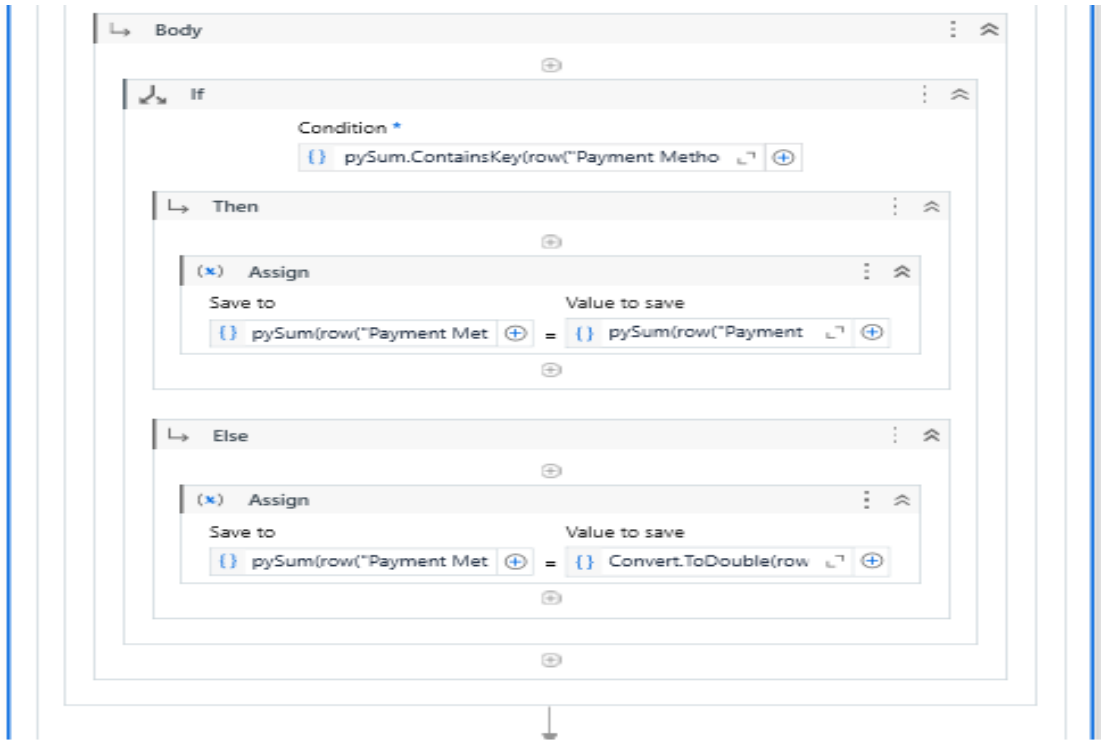
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Condition *
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Then
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=
pySum(row("Payment
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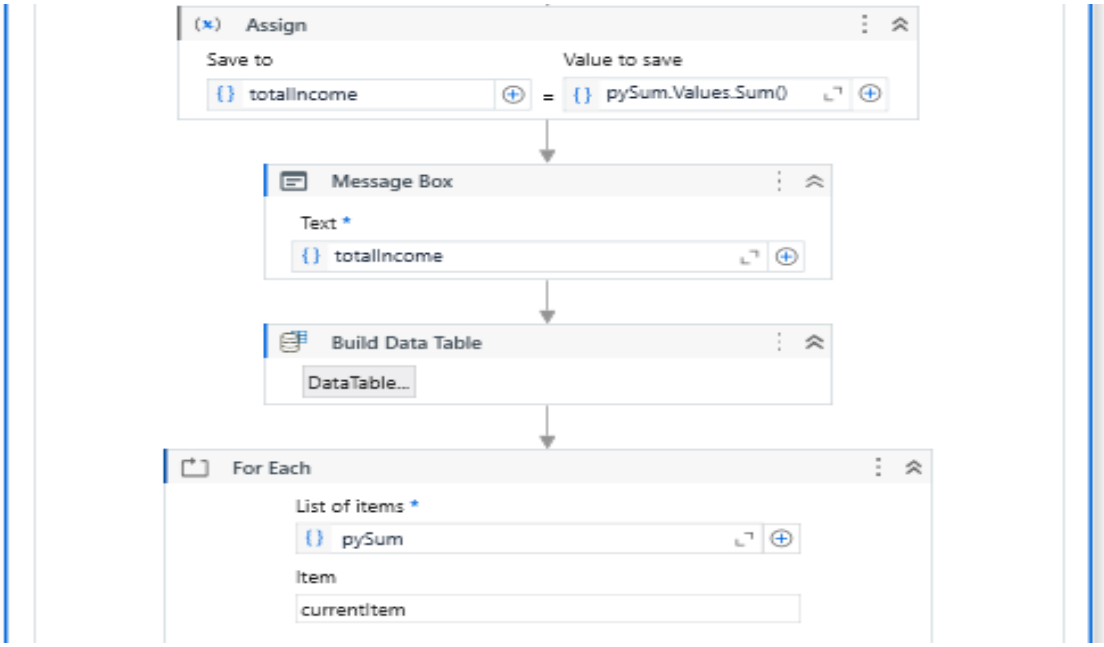
=
Convert.ToDouble(row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Text *
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Build Data Table
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For Each
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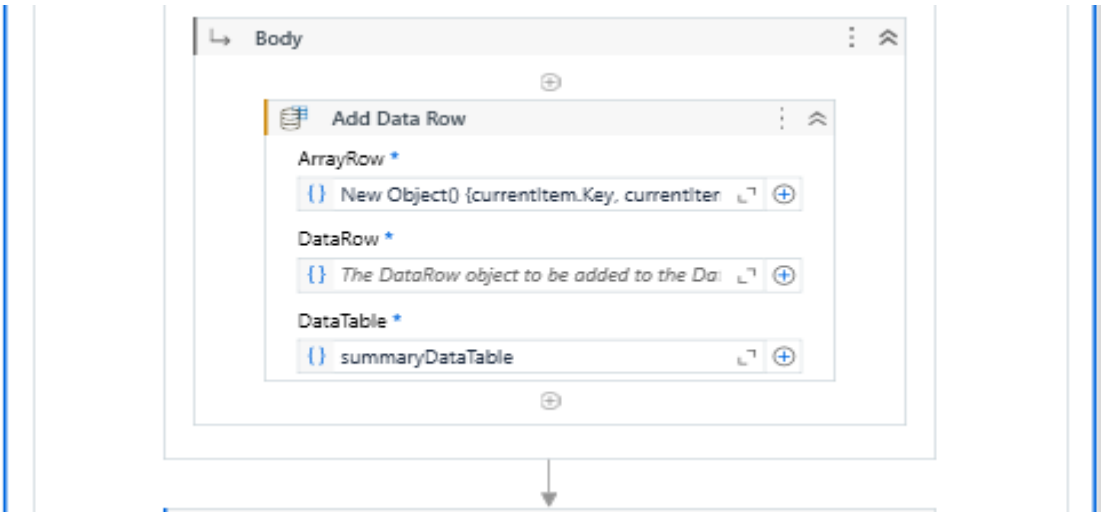
Item
currentItem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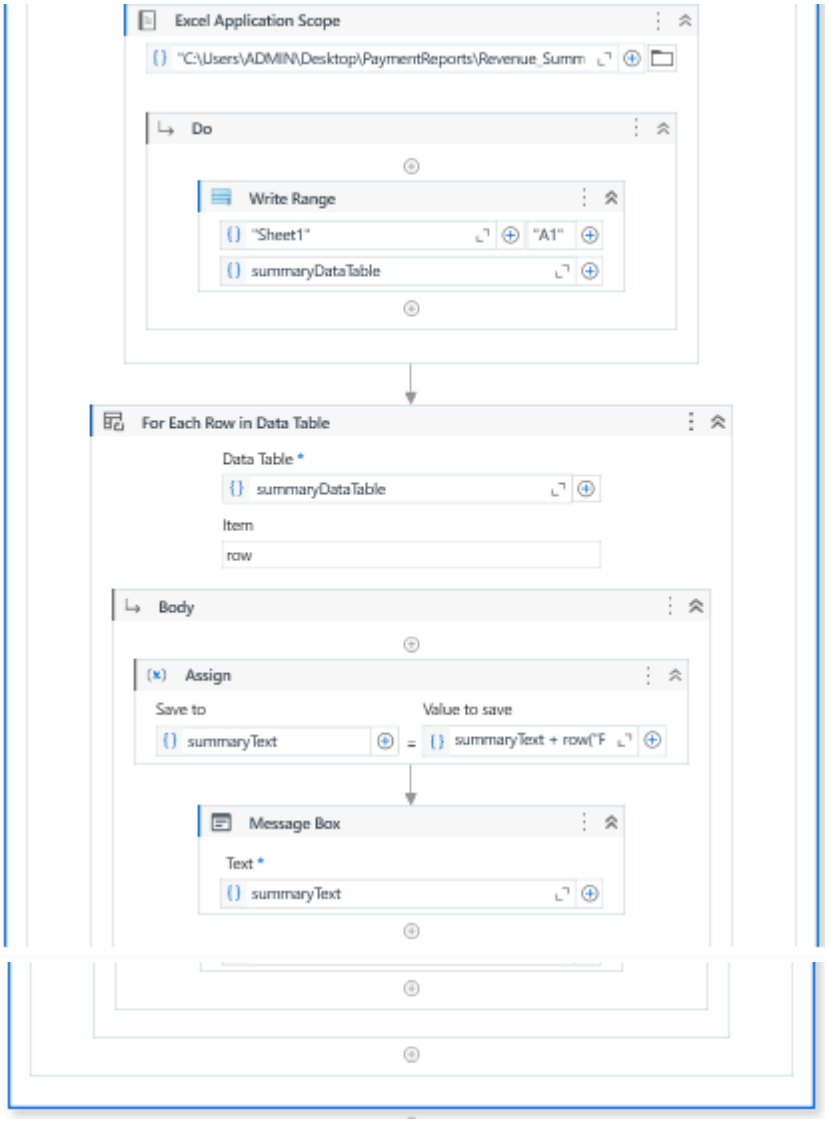
Add Data Row
ArrayRow *
New Object() {currentItem.Key, currentIter
DataRow *
The DataRow object to be added to the Da
DataTable *
summaryDataTable


Excel Application Scope
"C:\Users\ADMIN\Desktop\PaymentReports\Revenue_Summ
Do
Write Range
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"A1"
summaryDataTable
For Each Row in Data Table
Data Table *
summaryDataTable
Item
row
Body
Assign
Save to
Value to save
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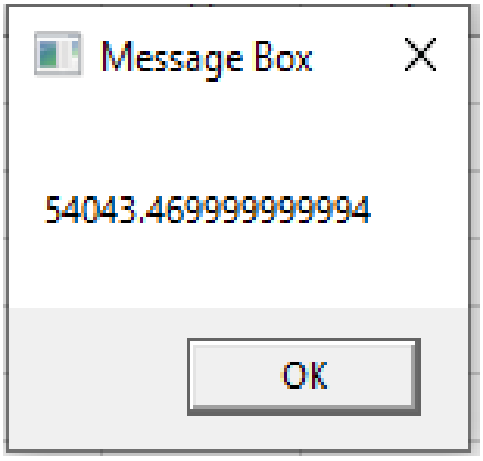
summaryText + row("F
Message Box
Text *
summaryText

OUTPUT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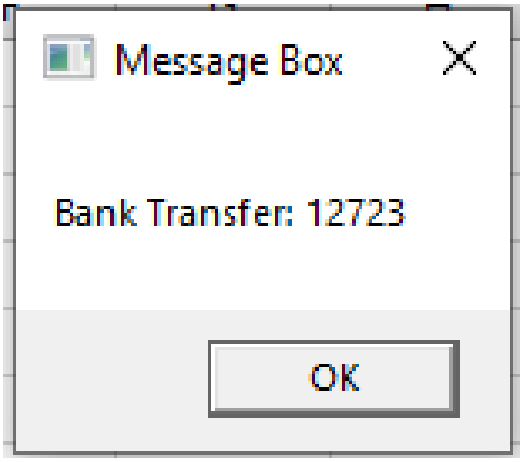
Message Box
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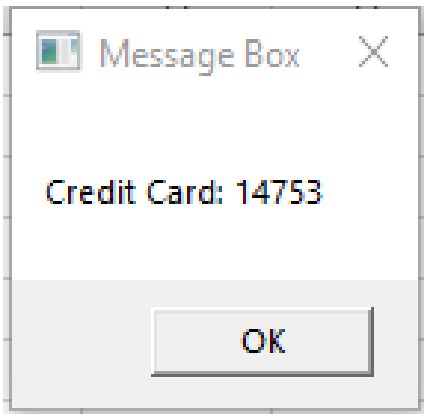
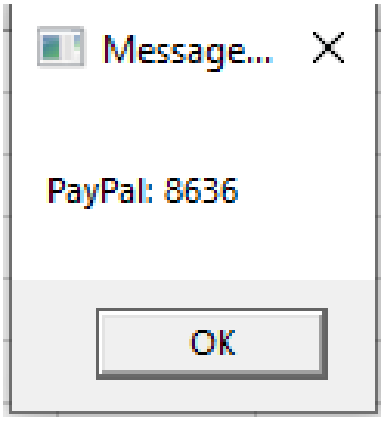
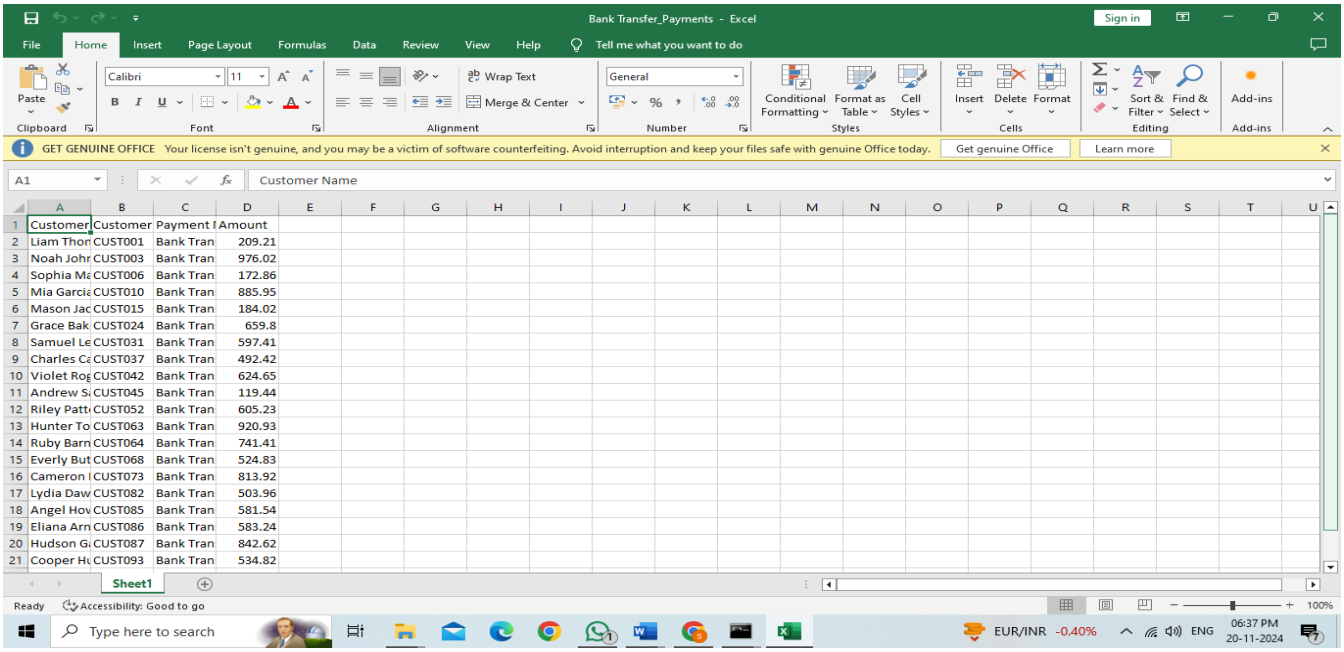
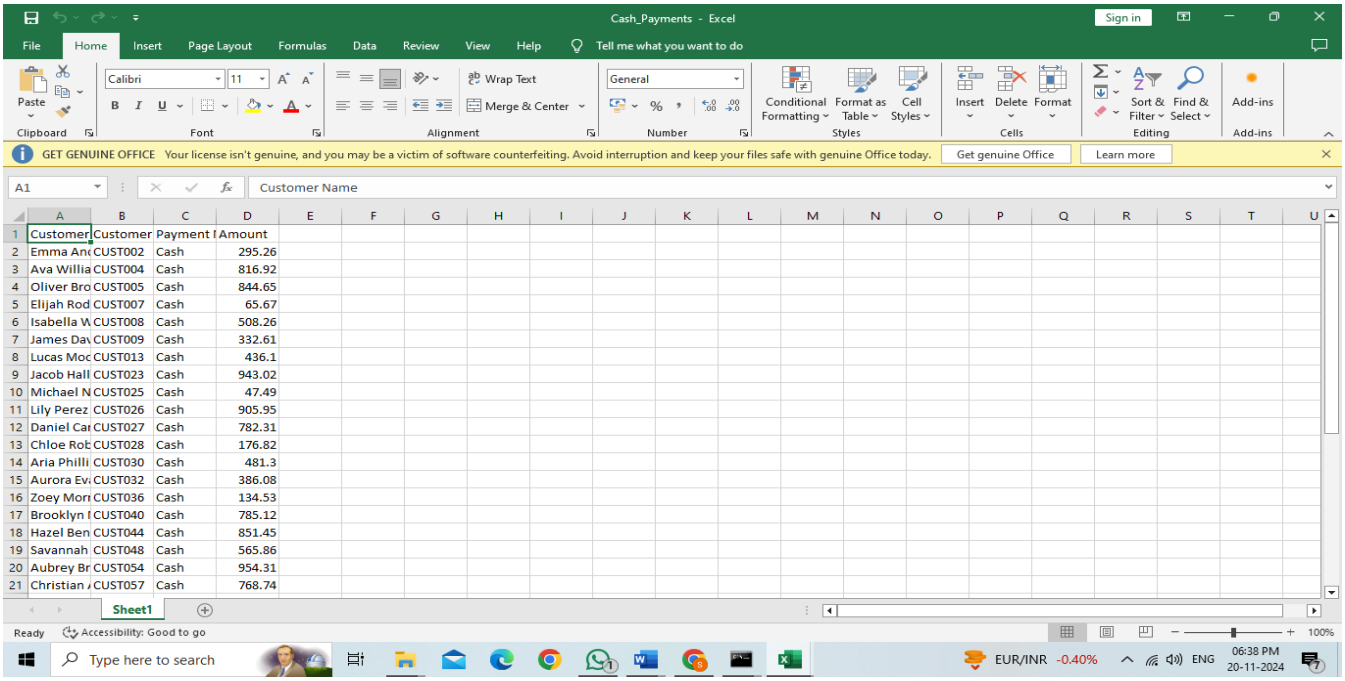
OK

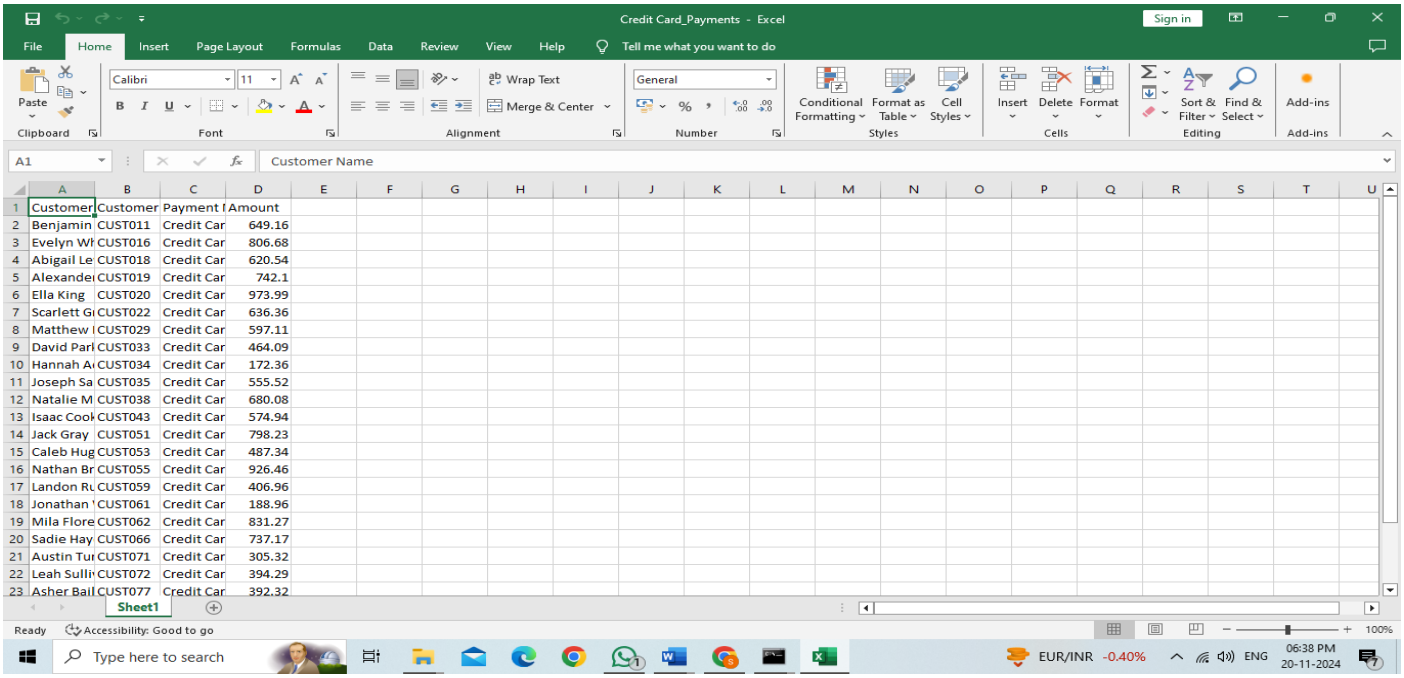




Excel Sheets:(Bank Transfer,CashPayments,CreditCard,PaypalPayments,RevenueSummary)






Credit Card_Payments - Excel
Customer Name
Customer Payment Amount
Benjamin CUST011 Credit Car 649.16
Evelyn Wh CUST016 Credit Car 806.68
Abigail Le CUST018 Credit Car 620.54
Alexander CUST019 Credit Car 742.1
Ella King CUST020 Credit Car 973.99
Scarlett Gi CUST022 Credit Car 636.36
Matthew I CUST029 Credit Car 597.11
David Parl CUST033 Credit Car 464.09
Hannah Ai CUST034 Credit Car 172.36
Joseph Sa CUST035 Credit Car 555.52
Natalie M CUST038 Credit Car 680.08
Isaac Cook CUST043 Credit Car 574.94
Jack Gray CUST051 Credit Car 798.23
Caleb Hug CUST053 Credit Car 487.34
Nathan Br CUST055 Credit Car 926.46
Landon Ru CUST059 Credit Car 406.96
Jonathan ' CUST061 Credit Car 188.96
Mila Flore CUST062 Credit Car 831.27
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Austin Tur CUST071 Credit Car 305.32
Leah Sulli CUST072 Credit Car 394.29
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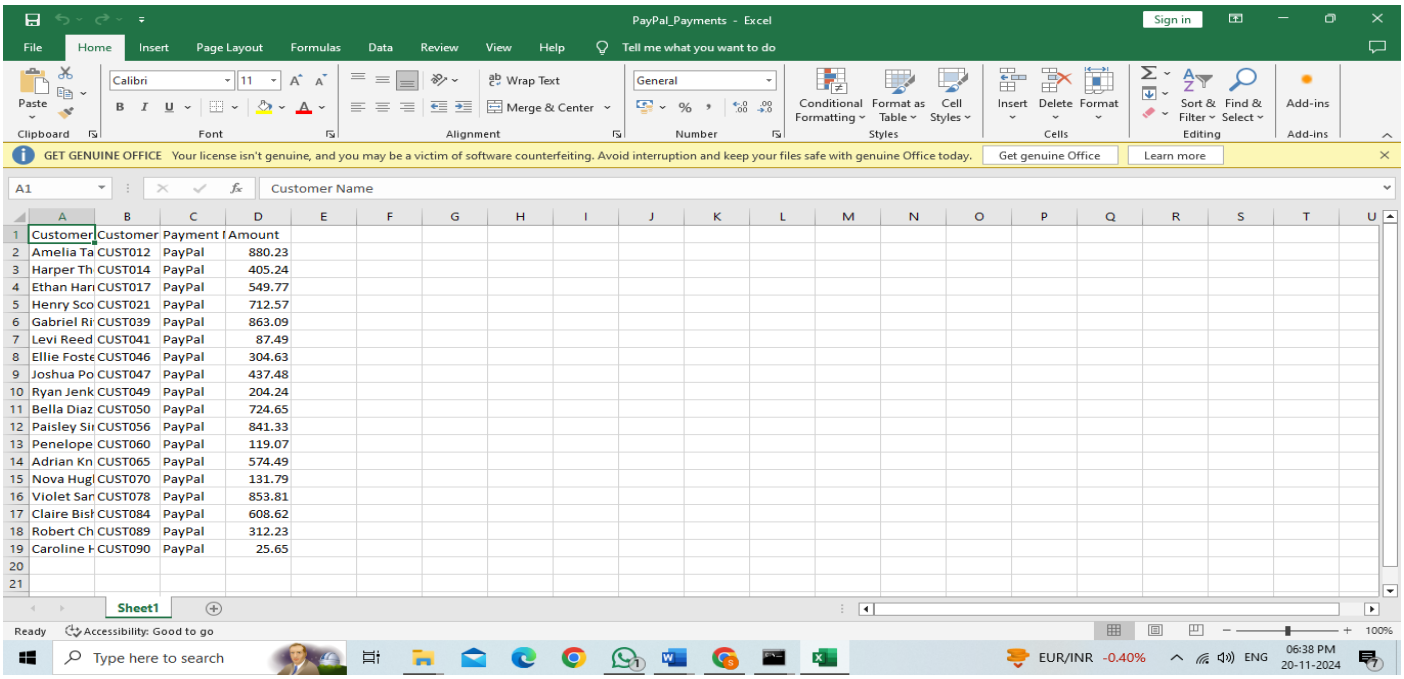
PayPal_Payments - Excel
GET GENUINE OFFICE Your license isn't genuine, and you may be a victim of software counterfeiting. Avoid interruption and keep your files safe with genuine Office today.
Get genuine Office
Learn more
Customer Name
Customer Payment Amount
Amelia Ta CUST012 PayPal 880.23
Harper Th CUST014 PayPal 405.24
Ethan Har CUST017 PayPal 549.77
Henry Sco CUST021 PayPal 712.57
Gabriel Ri CUST039 PayPal 863.09
Levi Reed CUST041 PayPal 87.49
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Ryan Jenk CUST049 PayPal 204.24
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Penelope CUST060 PayPal 119.07
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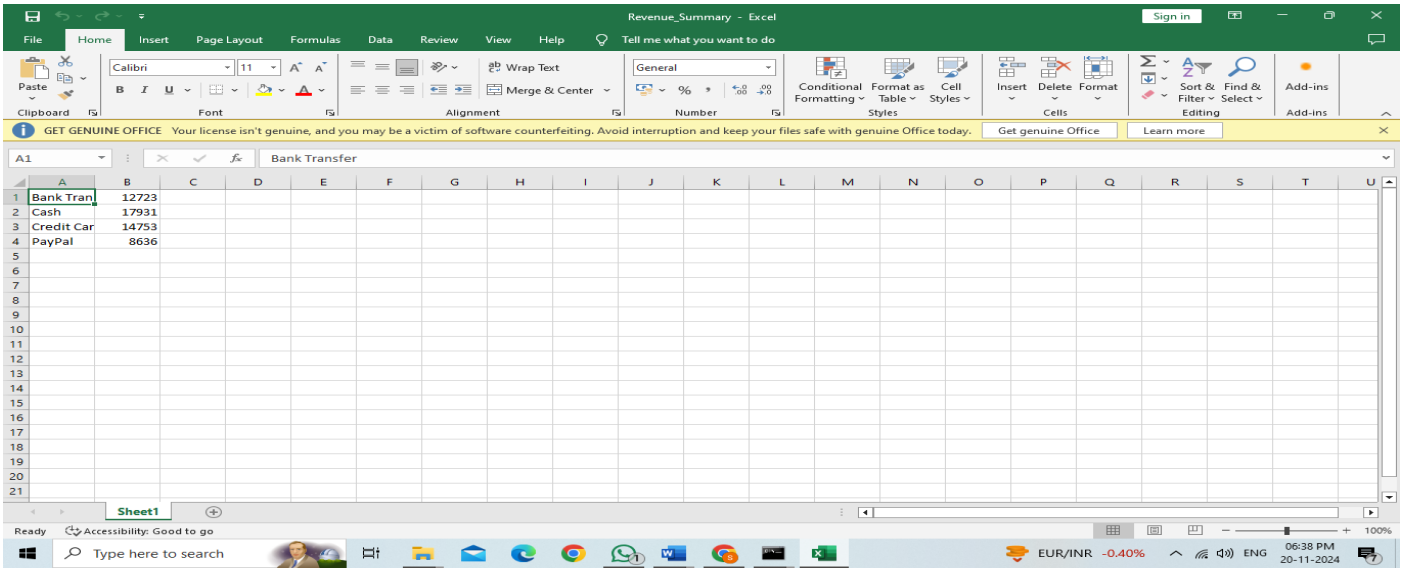
Revenue_Summary - Excel
GET GENUINE OFFICE Your license isn't genuine, and you may be a victim of software counterfeiting. Avoid interruption and keep your files safe with genuine Office today.
Get genuine Office
Learn more
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Cash 17931
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1. INTRODUCTION

1.1 General

Revenue management is a vital aspect of business operations, ensuring that payment data is accurately processed, classified, and analyzed for informed decision-making. Organizations often deal with large volumes of transaction data across various payment modes, which can result in inefficiencies if handled manually. Errors in processing or delays in summarizing financial data can impact reporting accuracy, disrupt operations, and affect revenue forecasting.

With the advent of Robotic Process Automation (RPA), repetitive and rule-based financial tasks can now be automated, enhancing efficiency and accuracy.

The Automated Revenue Analyzer leverages RPA technology to streamline the process of payment classification and revenue analysis. Built using UiPath Studio, the bot extracts payment data, segregates transactions based on payment methods, calculates total revenue for each mode, and compiles an aggregated income summary. This automation reduces manual workload, minimizes errors, and ensures timely financial reporting, significantly improving operational efficiency.

1.2 Objective

The primary objective of the Automated Revenue Analyzer is to provide a seamless and automated system for managing revenues by:

- Automating the classification of customer payment data based on modes.
- Calculating total transaction amounts for each payment mode.
- Generating an aggregated income summary.
- Reduc manual effort and ensure data accuracy..

1.3 Existing System

In many organizations, contract renewal tracking is done manually or using basic tools like spreadsheets. This system has several limitations:

- Manual Effort: Requires extensive monitoring, classification, and calculations by personnel.
- High Error Rate: Prone to mistakes such as incorrect classifications or miscalculations, leading to inaccurate financial reports.
- Inefficiency: Consumes significant time and resources, particularly for organizations handling large datasets.
- Lack of Scalability: Struggles to efficiently manage an increasing volume of transactions or diverse payment modes.

This existing system often results in delayed reporting, reduced accuracy in revenue analysis, and operational inefficiencies, impacting the organization's ability to make timely financial decisions.

1.4. Proposed System

The proposed system automates the revenue analysis process using UiPath Studio. Key features of the system include:

- **Automated Data Segregation:** The bot classifies customer payment data into separate Excel files based on payment modes (e.g., Credit Card, UPI, Net Banking).
- **Revenue Calculation:** Automatically calculates the total transaction amounts for each payment mode and compiles an aggregated income summary.
- **Dynamic Scheduling:** Utilizes UiPath Orchestrator to trigger the bot execution at regular intervals for timely analysis and reporting.
- **Real-Time Updates:** Updates Excel files with calculated totals and aggregated summaries for better monitoring and reporting.
- **Scalability:** Designed to handle large datasets and a variety of payment modes efficiently.

The proposed system addresses the inefficiencies of the existing manual process, providing a scalable, accurate, and automated solution to manage payment data and analyse revenue effectively.

2. LITERATURE REVIEW

The field of Robotic Process Automation (RPA) has witnessed remarkable advancements in recent years, revolutionizing business processes by automating repetitive tasks such as data processing, subscription tracking, and report generation. This section presents an in-depth analysis of existing research, methodologies, and tools related to RPA, payment data analysis, and report automation, aligning with the objectives of the **Automated Revenue Analyzer** project

2.1 Robotic Process Automation (RPA) in Financial Operations.

RPA leverages software robots to emulate human actions for executing structured, repetitive tasks. Jain and Bhutani (2020) describe RPA as a transformative technology that enhances operational efficiency, accuracy, and scalability in financial and business processes. Tools like UiPath and Blue Prism have demonstrated their effectiveness in automating data processing, invoice management, and financial reconciliations, enabling businesses to streamline operations while reducing human errors.

As noted by Harman and Hamilton (2022), RPA tools significantly reduce operational costs and processing times in financial domains. In particular, automating revenue analysis and payment classification ensures precise data management and improves financial reporting accuracy. Such systems can classify customer payments by mode, calculate transaction totals, and summarize revenues across payment channels, aligning with the goals of the Automated Revenue Analyzer.

2.2 Automating Payment Classification and Analysis

Payment classification and revenue tracking are critical for businesses to monitor financial health. Huang and Lee (2021) emphasize the role of automation in managing and analyzing transactional data. Automating tasks such as segregating payments by mode and aggregating revenue totals enables organizations to generate real-time insights, ensuring accurate and timely financial reporting. Brown (2020) highlights that RPA's adaptability allows it to integrate seamlessly with existing enterprise systems, enabling the extraction and classification

of financial data from diverse sources like spreadsheets and databases. This integration is crucial for the Automated Revenue Analyzer, which aims to classify payment data and compute transaction totals for effective revenue tracking.

2.3 Report Generation and Automation in RPA

The automation of report generation has become a vital aspect of business intelligence, providing organizations with actionable insights. Adams et al. (2018) detail how RPA-based solutions can generate automated reports from structured data, enabling businesses to save time and resources. Such reports are particularly valuable for summarizing payment data and revenue performance, which are central to the Automated Revenue Analyzer.

According to Bhatnagar (2021), generating daily or periodic reports with RPA enhances decision-making by delivering accurate and up-to-date financial insights. The proposed system incorporates a feature for generating automated reports in Excel format, providing a consolidated view of customer payments and revenue trends.

2.4 Challenges and Opportunities in RPA Implementation

Despite its advantages, implementing RPA solutions presents challenges such as system integration, process mapping, and maintaining data accuracy. Harman and Hamilton (2022) emphasize the need for careful planning and employee training to ensure successful deployment. Additionally, integrating RPA with existing financial systems and handling large datasets can pose significant hurdles.

Ferrer and Sancho (2020) discuss the importance of error handling and monitoring in automated systems to ensure data consistency and reliability. The Automated Revenue Analyzer addresses these challenges by incorporating robust logging and monitoring features, ensuring seamless operation and error detection.

2.5 Opportunities in Revenue Automation

The demand for automation in revenue analysis continues to grow, presenting opportunities for businesses to enhance efficiency and accuracy. Zhu and Ouyang (2019) highlight that

automating payment classification and revenue tracking can provide businesses with real-time insights, reducing dependency on manual processes.

As noted by Harman and Hamilton (2022), organizations can leverage RPA to develop scalable, error-free solutions for financial management. The Automated Revenue Analyzer builds on these advancements to automate payment data processing, revenue tracking, and report generation, delivering a comprehensive solution for businesses.

2.6 Conclusion

In conclusion, the application of Robotic Process Automation (RPA) in financial operations has transformed traditional processes by automating data classification, payment tracking, and revenue reporting. Literature highlights the significant advantages of RPA in enhancing accuracy, efficiency, and scalability in tasks that are repetitive and prone to human error. Integrating RPA with financial systems allows organizations to streamline payment data management, enabling faster processing and minimizing errors in reporting.

Automated revenue analysis systems have been recognized for their ability to segregate payment modes, calculate transaction totals, and generate timely reports. The reviewed studies emphasize how such systems improve financial oversight and reduce manual workloads, allowing businesses to focus on strategic decision-making. Although challenges like data consistency and system integration exist, RPA solutions address these issues through advanced error-handling mechanisms and adaptability to various financial platforms.

In conclusion, the integration of RPA into financial operations represents a transformative step toward achieving efficiency and precision in revenue analysis. The proposed Automated Revenue Analyzer leverages these advancements to automate payment classification, calculate revenues, and generate comprehensive reports, ensuring accurate financial insights and reducing manual intervention. This solution is poised to deliver a scalable and reliable approach to financial management in modern business environments.

3. SYSTEM DESIGN

3.1 General

The system design section outlines the structural and functional components of the *Automated* Revenue Analyzer. It provides a detailed description of the system's architecture, the flow of operations, and the sequence of activities that ensure efficient classification and analysis of customer payment data. The system design ensures that the bot operates accurately, reliably, and efficiently, leveraging UiPath Studio's capabilities.

3.1.1 System Flow Diagram

The System Flow Diagram represents the overall workflow of the Contract Renewal Reminder Bot, illustrating the key steps involved from data input to email notifications.

- Data Input: The process begins with reading customer payment data from an Excel file.
- Data Processing: The bot segregates payment data based on payment modes (e.g., Credit Card, UPI, Net Banking).
- Revenue Calculation**:** The bot calculates the total transaction amount for each payment mode.
- Aggregate Summary: The bot computes the overall income by summing up totals from all payment modes.
- Data Output: The results, including segregated files and revenue summaries, are saved in an organized format.
- Loop Continuation: The process repeats for all rows of data in the input file.

3.1.2 Architecture Diagram

The Architecture Diagram provides a high-level view of the system components and their interactions. It showcases the integration of UiPath Studio, Excel for payment data management, and UiPath Orchestrator for scheduling and monitoring automation tasks.

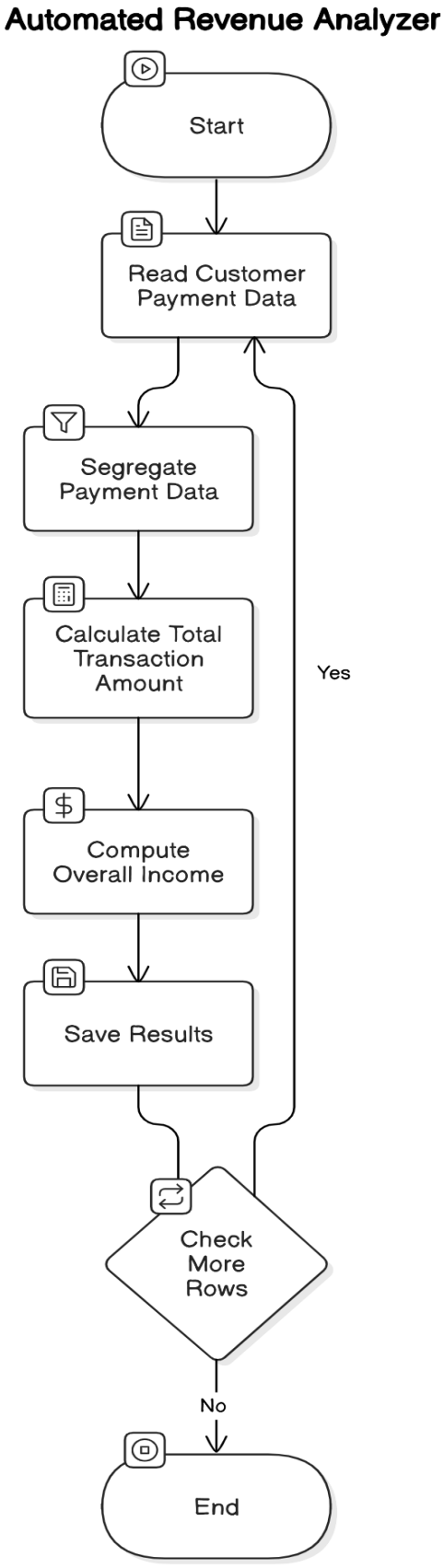
- UiPath Studio: Central platform for developing and managing the automation workflow.
- Excel: Stores customer payment data, segregated outputs, and revenue summaries.
- UiPath Activities: Performs data segregation, calculations, and updates results to Excel files.
- Triggers and Scheduler: Configured in UiPath Orchestrator to execute the bot at specified intervals, ensuring timely revenue analysis.

3.1.3 Sequence Diagram

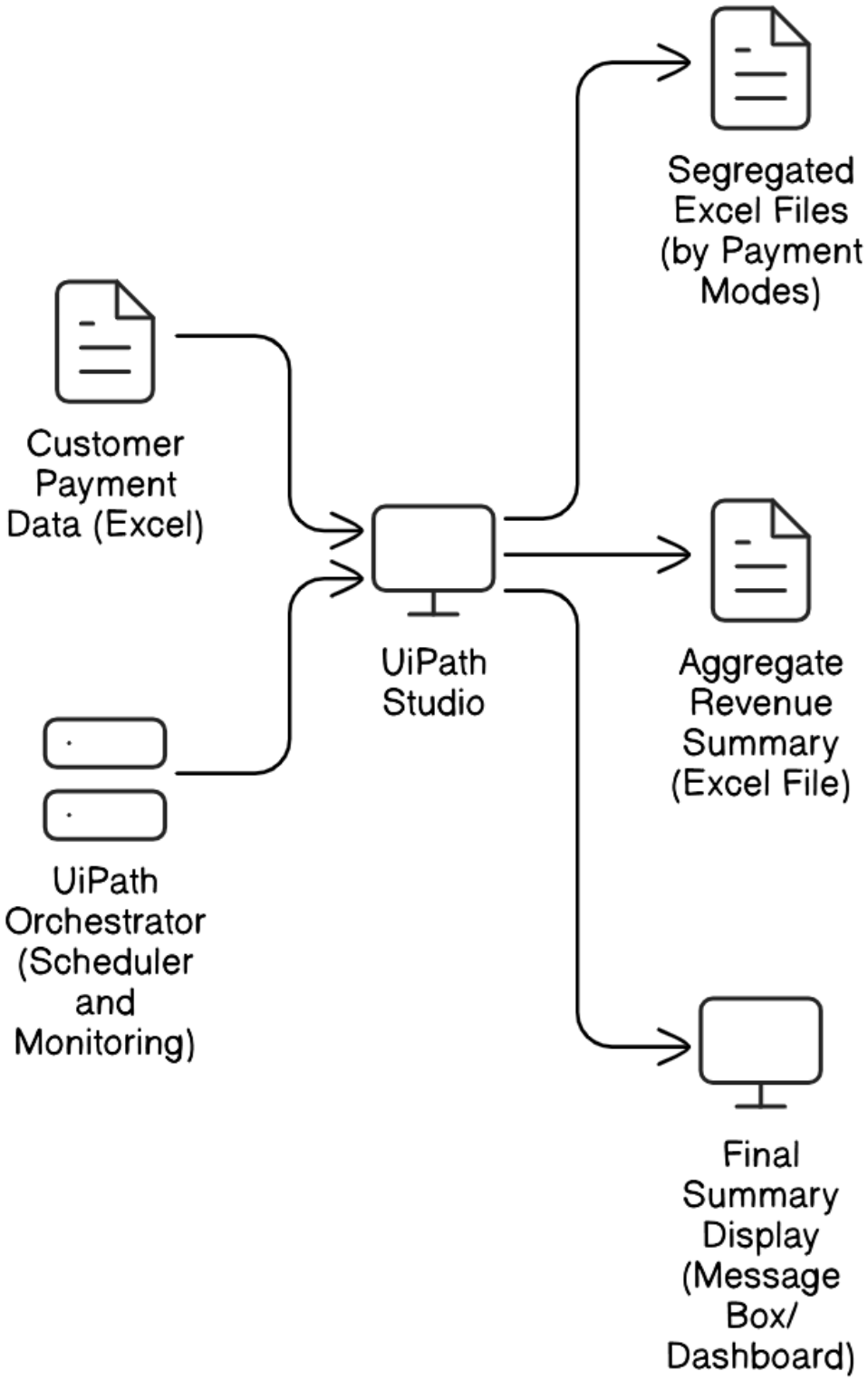
The Sequence Diagram depicts the step-by-step interaction between the bot and the system components for analysing revenue:

- Bot Initialization: The bot is triggered to start based on a schedule or user input.
- Read Payment Data (Excel): The bot reads the initial customer payment data from the Excel file, including payment mode and amount.
- Process Data: The bot iterates through each customer record to segregate payments based on payment mode (e.g., cash, card, digital).
- Calculate Transaction Amount: For each payment mode, the bot calculates the total amount transacted.
- Create Separate Files: The bot segregates customer data by payment mode into individual Excel files for each mode.
- Calculate Aggregate Income: The bot calculates the total income from all modes by summing up amounts from each file.
- Update Excel Files: The bot updates the original and segregated Excel files with the calculated amounts and aggregates.
- Loop to Next Customer Record: The process continues for the next customer record until all are processed.

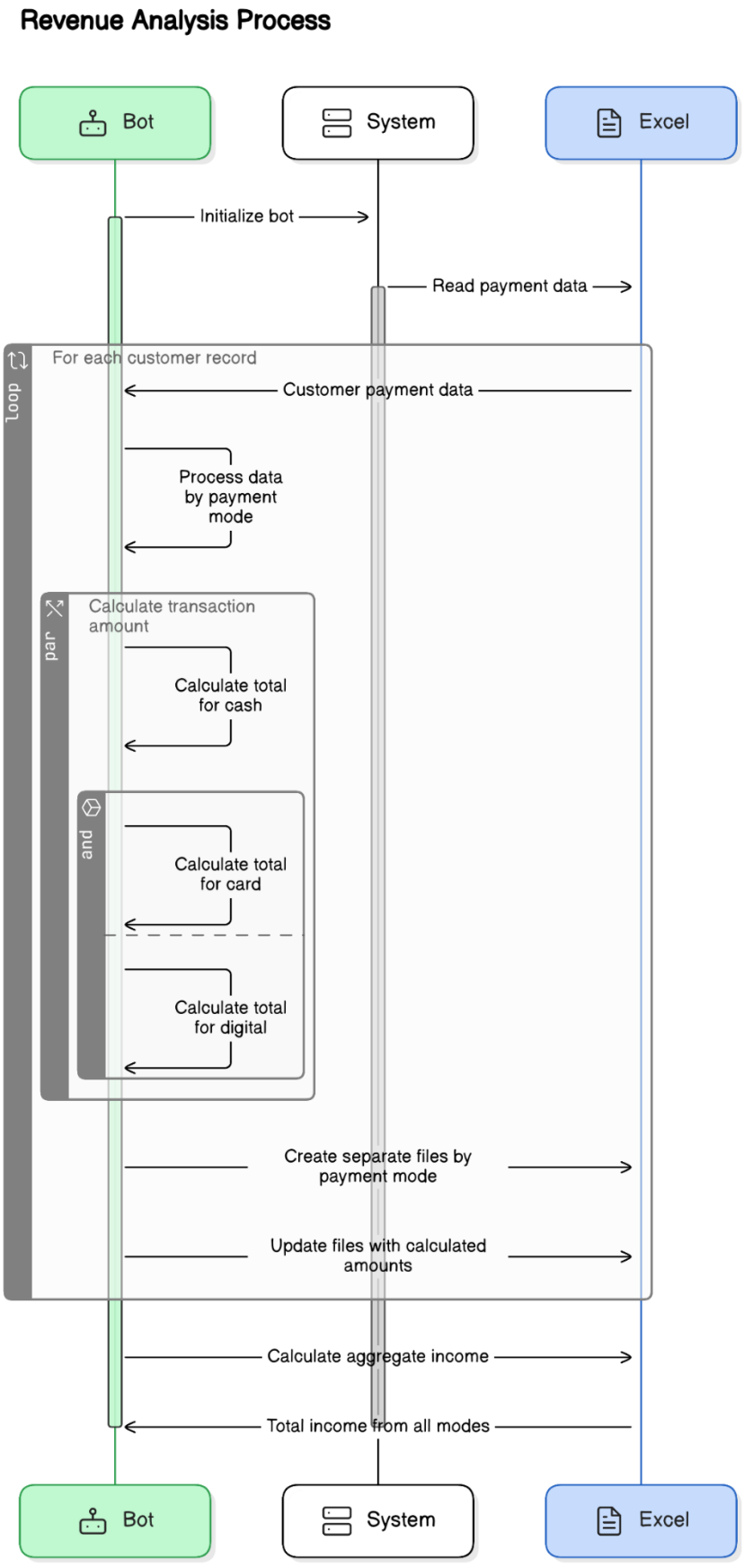
SYSTEM FLOW DIAGRAM



ARCHITECTURE DIAGRAM



SEQUENCE DIAGRAM



4. PROJECT DESCRIPTION

4.1 Methodology

The methodology outlines the structured approach adopted for developing the Automated Revenue Analyzer bot. The process ensures the solution is efficient, accurate, and scalable. The project development is divided into the following stages:

1. Requirement Analysis
   - Data Understanding: Gathered details of customer payment data, including payment methods and transaction amounts.
   - Scope Definition: Identified key functionalities, such as segregating data by payment mode, calculating totals, and generating aggregated summaries
   - Integration Points: Determined the use of Excel for data storage and UiPath for automation.
2. System Design
   - Workflow Design: Designed a systematic workflow that includes:
     - Reading payment data from an Excel file.
     - Classifying payments by mode.
     - Calculating totals and aggregate income.
     - Updating segregated files and summary data.
   - Visual Documentation: Created flow diagrams and architectural layouts to visualize the bot operations.
3. Development
   - Tool Utilization: Developed the automation workflow using UiPath Studio.
   - Data Handling: Configured Excel Application Scope for reading and writing data.
   - Logic Implementation: Designed logic for:
     - Segregating payments into separate Excel files.
     - Calculating total amounts by payment mode.
     - Aggregating overall income across all modes.

4. Testing and Validation
    - Tested the bot with various datasets to ensure accurate segregation, calculations and proper handling of edge cases, such as missing payment modes.
    - Validated the bot's capability to manage errors, including Excel file issues or invalid data.
5. Deployment and Scheduling
    - Published the bot on UiPath Orchestrator for centralized management.
    - Configured scheduled triggers to automate the bot’s execution daily for real-time financial analysis.
6. Maintenance
    - Established logging mechanisms to track and analyse the bot's performance.
    - Periodically updated the bot to adapt to changes in the data format and incorporate new business requirements.

4.1.1 Modules

The Automated Revenue Analyzer project is divided into the following modules, ensuring structured development and functionality:

1. Data Input Module
    - Purpose: Reads customer payment data from an Excel file.
    - Implementation: Utilizes the Excel Application Scope and Read Range activities in UiPath Studio to retrieve the payment details.
2. Data Segregation Module
    - Purpose: Segregates payment data into separate files based on payment modes (e.g., Cash, Card, Digital).
    - Implementation: Uses conditional statements with Filter Data Table and Write Range activities to create individual Excel files for each payment mode.
3. Total Calculation Module

- Purpose: Calculates the total transaction amount for each payment mode.
- Implementation: Utilizes For Each Row activity and Assign operations to aggregate transaction values for each mode.

4. Aggregate Income Calculation Module
   - Purpose: Computes the total income across all payment modes.
   - Implementation: Sums up the calculated totals from each payment mode file using Read Range, DataTable manipulation, and Assign activities.
5. Data Update Module
   - Purpose: Updates the original Excel sheet with segregated totals and aggregate income.
   - Implementation: Uses Write Cell and Write Range activities to record updated values and summary details.
6. Scheduler and Trigger Module
   - Purpose: Automates the execution of the bot daily for up-to-date payment analysis.
   - Implementation: Configures UiPath Orchestrator triggers to execute the bot at a specified time.

5. CONCLUSIONS

5.1 GENERAL

The Automated Revenue Analyzer project successfully addresses the challenge of classifying and analyzing customer payment data, ensuring accurate financial reporting and efficient processing. By automating this process, the bot reduces manual workload, minimizes errors, and provides timely and accurate payment summaries.

Key findings from the development and implementation of the project include:

1. Automation Benefits:

The bot efficiently automates the classification and analysis of payment data, eliminating the need for manual intervention. This leads to:

- Reduced administrative workload.
- Increased accuracy in data processing.
- Timely and reliable financial summaries.

2. Scalability:

The solution is highly scalable, capable of processing large datasets of customer payment information. The design enables seamless handling of data across different payment modes without performance degradation.

3. Flexibility and Customization:

The system supports flexible configurations, allowing businesses to:

- Customize payment classifications.
- Adjust reporting formats as needed.
- Adapt to future requirements, such as additional payment modes or integration with accounting systems.

4. Error Handling and Monitoring:

Built-in error-handling mechanisms ensure:

- Identification and reporting of issues, such as data inconsistencies or calculation errors.
- Comprehensive logging for troubleshooting and auditing purposes.

5. Integration with UiPath Orchestrator:

Deployment on UiPath Orchestrator ensures:

- Fully automated execution with scheduled triggers for regular processing.
- Enhanced monitoring capabilities to track performance and resolve issues quickly.

6. Enhanced Financial Analysis:

By providing accurate and up-to-date payment summaries, the system supports:

- Improved financial decision-making.
- Timely identification of revenue trends across different payment modes.

In conclusion, The Automated Revenue Analyzer project not only streamlines the financial analysis process but also highlights the potential of Robotic Process Automation (RPA) in enhancing operational efficiency and accuracy. This solution enables organizations to save time, optimize resources, and maintain reliable financial reporting. Future enhancements may include: integration with advanced reporting tools for deeper insight, expansion to handle more complex datasets, development of dashboards for real-time financial analysis. This project demonstrates the transformative impact of automation in simplifying and optimizing business operations.

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These references now focus on financial data automation, revenue management, and the use of RPA tools such as UiPath for related processes.