AUTOMATED EMAIL SENDING FOR DAILY REPORT

A PROJECT REPORT

Submitted by

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OAI1903 -INTRODUCTION TO ROBOTIC PROCESS AUTOMATION

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CHENNAI – 602 105

NOVEMBER 2024

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BONAFIDE CERTIFICATE

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ABSTARCT

This project focuses on the development of an automated system to streamline the process of daily report generation and distribution through Robotic Process Automation (RPA). The primary objective is to eliminate manual intervention in collecting, processing, and distributing reports, thus ensuring timely, accurate, and consistent output. The system fetches data from predefined sources such as databases, Excel files, or CSV files, processes the information, and generates reports in a standardized format (e.g., PDF, Excel). The generated report is then automatically attached to an email, which is sent to designated recipients using an email client like Outlook or Gmail.

This automation significantly reduces human error and operational overhead while increasing efficiency. By using RPA to handle routine reporting tasks, organizations can focus on more strategic activities, improving overall productivity and decision-making. The solution is applicable across multiple business departments, including sales, HR, and operations, where daily or regular reporting is crucial. With real-time monitoring and alert features, the system ensures continuous performance and easy management, ultimately improving the workflow for organizations.

ACKNOWLEDGEMENT

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

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RAJAKUMARAN BHAVANISHRAJ (2116220701215)

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ABBREVIATION	ACCRONYM
RPA	Robotic Process Automation
CSV	Comma-separated values

CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

In today's fast-paced business environment, timely and accurate information sharing is crucial for decision-making and operational efficiency. Daily reporting, a common task across various departments such as sales, human resources, and operations, often requires repetitive manual effort. This process can be prone to errors, delays, and inconsistencies, ultimately affecting organizational productivity. To address these challenges, this project introduces an automated solution using Robotic Process Automation (RPA) to streamline the daily reporting process.

The RPA bot developed in this project automates the entire workflow of data collection, report generation, and email dissemination. By fetching data from predefined sources, such as databases, Excel spreadsheets, or CSV files, the bot processes and organizes the information into a standardized report template. This ensures that reports are consistently formatted and ready for use. Once the report is generated, the bot drafts an email, attaches the report, and sends it to a predetermined list of recipients using an email client like Outlook or Gmail. The automation operates on a schedule, ensuring that the reports are sent at the same time every day without requiring manual intervention.

This automated reporting solution offers multiple benefits. It eliminates the repetitive manual tasks involved in report creation and distribution, significantly reducing the likelihood of human error. The bot also ensures consistency in report formatting and timing, fostering a reliable reporting mechanism. Additionally, it allows employees to focus on more value-added tasks rather than routine administrative duties, thereby enhancing overall productivity.

The proposed RPA solution is flexible and scalable, making it suitable for a wide range of applications. Whether it's sales performance tracking, HR compliance reporting, or operational efficiency metrics, this automation can be customized to meet the specific needs of different departments. By leveraging this technology, organizations can save time, reduce costs, and enhance the accuracy of their daily reporting processes.

1.2 Objective

The objective of this project is to design and implement an automated Robotic Process Automation (RPA) bot that revolutionizes the daily reporting process by eliminating the need for manual effort and ensuring accuracy, consistency, and efficiency. The bot is intended to seamlessly automate the entire workflow, starting with the collection of data from predefined sources such as databases, Excel files, or CSV files, thereby saving time and minimizing human involvement. Once the data is collected, the bot will process and compile it into a standardized and customizable report template, ensuring uniformity and adherence to organizational reporting standards. In addition to generating the report, the bot will also automate its dissemination by drafting an email, attaching the report, and sending it to a designated list of recipients using email clients like Outlook or Gmail. This solution not only addresses the challenges of human error, delays, and inconsistencies but also ensures the timely and consistent delivery of critical information. By automating routine tasks, the bot allows employees to focus on strategic activities, driving productivity and operational excellence. Furthermore, its scalable and adaptable design makes it suitable for use across various departments, including sales, HR, and operations, where daily reporting is a fundamental requirement.

1.3 Existing System

The current system for generating and distributing daily reports is predominantly manual, involving multiple repetitive tasks that consume significant time and effort. The process begins with data collection, where employees retrieve information from various sources such as databases, spreadsheets, or CSV files. This manual extraction is not only labor-intensive but also susceptible to errors, such as overlooking critical data or inputting incorrect values. Moreover, in cases where data is stored in disparate systems, the process becomes even more cumbersome, requiring additional time to compile and consolidate the information into a usable format.

Once the data is gathered, the next step is report creation, which involves organizing the data and formatting it into a structured report. This stage is prone to inconsistencies, as the formatting and content often depend on individual preferences or levels of attention to detail. Such

inconsistencies can lead to reports that vary in quality, making it challenging to maintain a standardized reporting format across the organization.

The final phase of the existing system involves distributing the report. Typically, this is done by drafting an email, attaching the report, and sending it to a list of recipients. This process relies heavily on the availability and diligence of the individual responsible, leading to potential delays in report delivery. Additionally, human errors, such as forgetting to attach the report or missing recipients, are common and can disrupt the flow of critical information. For recurring reports, employees often need to repeat these steps daily, further exacerbating inefficiencies and creating a monotonous workload.

Overall, the existing manual system is not scalable and struggles to meet the demands of modern business operations, where timely and accurate reporting is essential. The reliance on manual effort introduces variability, increases the risk of errors, and diverts valuable human resources from more strategic activities. These challenges highlight the urgent need for an automated solution to optimize the process, improve consistency, and ensure timely delivery of daily reports.

1.4 Proposed System

The proposed system introduces a Robotic Process Automation (RPA) solution to address the inefficiencies and limitations of the current manual reporting process. This system is designed to automate the end-to-end workflow of daily report generation and distribution, ensuring consistency, accuracy, and timeliness. By leveraging RPA technology, the bot will perform tasks such as data collection, report creation, and email dissemination without requiring manual intervention.

The bot will fetch data from predefined sources, such as databases, Excel files, or CSV files, using preconfigured workflows. This eliminates the need for manual data retrieval, reducing the risk of errors and delays. The collected data will then be processed and organized into a standardized report template. This ensures uniformity in report formatting, allowing stakeholders to easily interpret and utilize the information.

Once the report is generated, the bot will automate the report distribution process. It will draft an email, attach the report, and send it to a predefined list of recipients using email clients like Outlook or Gmail. The system can be scheduled to perform these tasks at specific times, ensuring that reports are consistently delivered without requiring human oversight.

The proposed system offers several key advantages over the existing manual process. It eliminates repetitive tasks, reducing the likelihood of errors and freeing up employees to focus on higher-value activities. The automation ensures timely and consistent report delivery, enhancing operational efficiency and decision-making. Additionally, the system is scalable and adaptable, making it suitable for various departments and use cases, such as sales, HR, and operations.

By implementing this RPA-driven solution, organizations can achieve significant time savings, improve reporting accuracy, and enhance overall productivity, addressing the challenges posed by the current manual system.

CHAPTER 2

LITERATURE REVIEW

Robotic Process Automation (RPA) has emerged as a transformative technology for automating repetitive and rule-based tasks, gaining widespread recognition for its ability to streamline workflows and improve operational efficiency. Studies, such as those by Van der Aalst et al. (2018), highlight RPA's potential to reduce human error, enhance accuracy, and lower operational costs by automating mundane tasks. These benefits are particularly relevant in reporting processes, where consistency and timeliness are critical. In the context of daily reporting, RPA ensures uniformity in report formatting and minimizes delays caused by manual intervention.

Automation in data collection and reporting has also been extensively researched, with findings suggesting significant improvements in productivity and data reliability. Syed et al. (2020) discuss how automated systems can integrate seamlessly with data sources like databases, spreadsheets, and cloud platforms, enabling faster and more accurate data processing. This is crucial for organizations that depend on daily reports for decision-making, as automation eliminates errors and ensures timely access to information.
Additionally, the integration of email automation into RPA workflows has been shown to enhance communication processes. Research by Sharma and Gupta (2021) illustrates how RPA bots can automate tasks like drafting and sending emails with attachments, ensuring consistent and error-free communication. This capability is particularly useful for distributing daily reports to designated recipients without manual effort, a key feature of the proposed system.
The scalability and adaptability of RPA solutions have also been well-documented. This flexibility aligns with the proposed system's objective to serve multiple departments through a unified reporting solution.

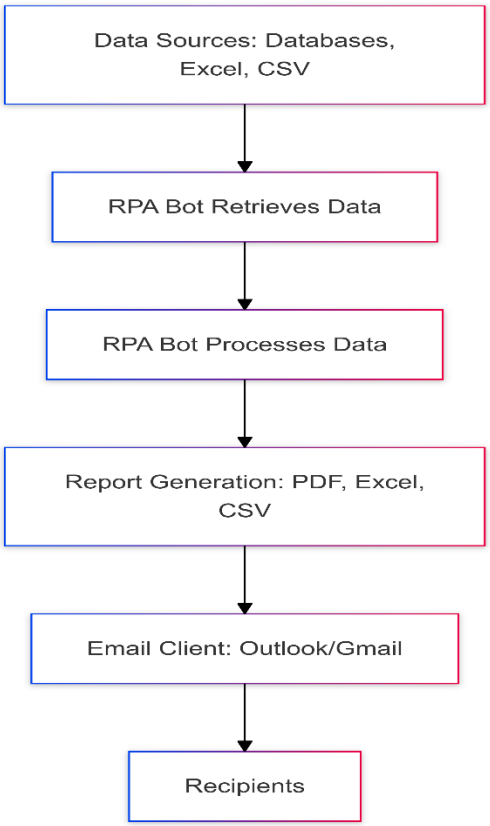
Overall, the literature underscores the feasibility and advantages of using RPA for automating daily reporting processes. By addressing inefficiencies in data collection, report creation, and distribution, RPA solutions offer a reliable and efficient alternative to manual workflows. The proposed system builds on these findings, presenting a scalable and adaptable approach to automating daily reporting tasks, with the potential to improve accuracy, productivity, and organizational efficiency.

CHAPTER 3

SYSTEM DESIGN

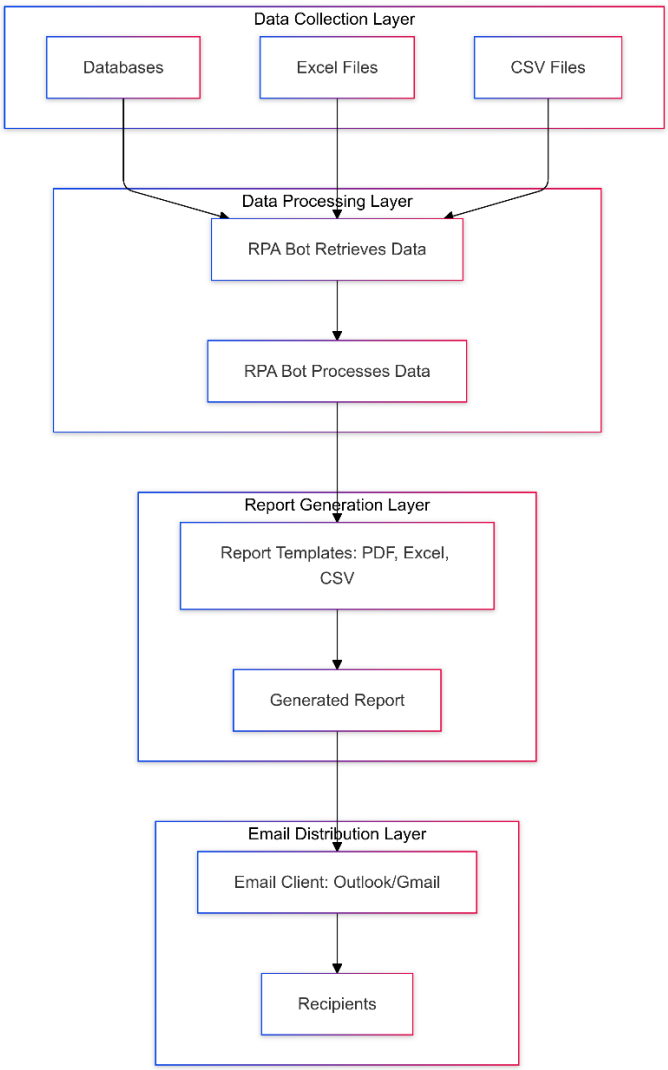
3.1 SYSTEM FLOW DIAGRAM

The system flow diagram represents the automated process of generating and distributing daily reports using Robotic Process Automation (RPA). The process begins with Data Sources, such as databases, Excel, or CSV files, where the necessary data is stored. The RPA Bot then retrieves and processes this data automatically, eliminating manual effort. Once the data is processed, the bot generates a standardized report based on a predefined template. Finally, the Email Client (e.g., Outlook or Gmail) is used by the bot to send the generated report to a predefined list of Recipients. This automation streamlines the entire reporting process, ensuring consistency, accuracy, and timely delivery while reducing human error and manual intervention.



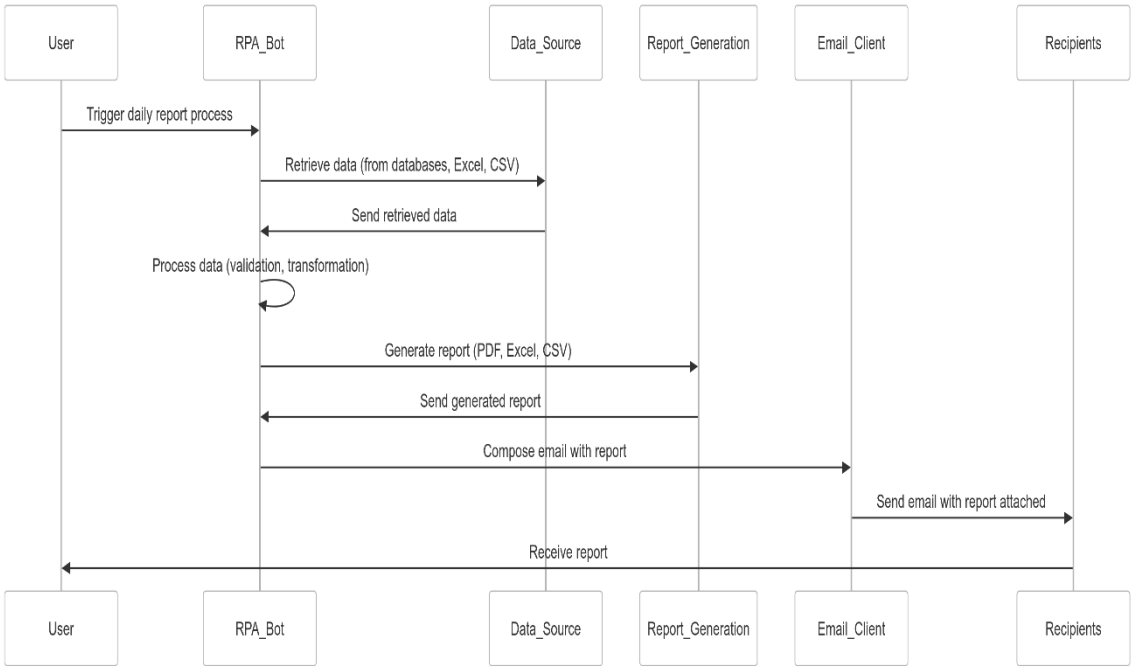
3.2 ARCHITECTURE DIAGRAM

The architecture diagram illustrates the structure of the automated daily report generation and distribution system using Robotic Process Automation (RPA). It consists of several key components: Data Sources (databases, Excel, or CSV files), where the required data is stored; the RPA Bot, which automatically retrieves and processes this data; the Report Generation layer, where the bot formats the data into a standardized report; and the Email Distribution layer, where the bot sends the generated report via email to a predefined list of recipients. The system is designed to automate the entire workflow, ensuring accuracy, consistency, and timely delivery of reports while minimizing human intervention.



3.3 SEQUENCE DIAGRAM

The sequence diagram illustrates the step-by-step flow of interactions between various components involved in the automated daily reporting process using Robotic Process Automation (RPA). It starts with the RPA Bot initiating the process by fetching data from the Data Sources, such as databases, Excel, or CSV files. Once the data is retrieved, the bot processes and organizes it, then generates the report using a predefined template. After generating the report, the bot interacts with the Email Client to draft an email, attach the report, and send it to the designated Recipients. The diagram highlights the sequence of these actions, ensuring that each step is executed in the correct order for efficient report generation and distribution, with minimal manual involvement.



CHAPTER 4

PROJECT DESCRIPTION

Module 1: Data Collection and Retrieval

The Data Collection and Retrieval module is responsible for gathering the necessary data from various predefined sources like databases (SQL, Oracle, etc.), Excel spreadsheets, or CSV files. The RPA bot automatically connects to these data sources at set intervals (e.g., daily) to retrieve relevant data based on specific queries or filters. This eliminates the need for manual data extraction, saving time and reducing errors. The data is collected in real-time or according to the set schedule, ensuring that the report is always generated with the most up-to-date information. The module also ensures that different formats of data (structured or unstructured) can be processed without issues.

Key Features:

- Connects to multiple data sources, including databases, spreadsheets, and CSV files.
- Retrieves data using predefined filters or queries.
- Supports various data formats (e.g., structured, unstructured).
- Ensures data retrieval at scheduled intervals, maintaining data accuracy.
- Stores the retrieved data in an organized format for processing.

Benefits:

- Reduces manual effort in data collection.
- Ensures timely and accurate data retrieval.
- Improves data consistency and accuracy by automating the retrieval process.

Module 2: Data Processing and Transformation

Once the data is collected, the Data Processing and Transformation module handles the manipulation and cleaning of the data. This module applies business rules, data validation checks, and transformation functions to ensure the data is ready for report generation. It may include tasks such as filtering out irrelevant records, performing calculations, aggregating values, and correcting errors. This

step ensures that the final report is accurate, consistent, and contains only the necessary data.

The module can also be configured to handle complex transformations such as currency conversions, date formatting, or applying custom calculations for KPIs (Key Performance Indicators). This processing layer ensures that the raw data collected from various sources is formatted and structured according to the reporting needs.

Key Features:

- Applies data validation checks to ensure accuracy.
- Performs necessary data transformations such as calculations, aggregations, and formatting.
- Handles complex data manipulations like currency conversion or KPI calculations.
- Cleans and filters the data to remove unnecessary or incorrect records.
- Formats the data for easy integration into the report template.

Benefits:

- Ensures data quality by applying validation and transformation rules.
- Minimizes human errors in data processing.
- Makes complex data usable for report generation.

Module 3: Report Generation

The Report Generation module is responsible for compiling the processed data into a standardized report. This module uses predefined templates that are customized according to organizational requirements (such as PDF, Excel, or CSV formats). The report can include tables, graphs, and charts to visualize the data effectively. By using templates, the system ensures that all reports maintain a consistent format, which helps to improve readability and understanding.

The bot automatically populates the templates with the processed data, ensuring that the report is generated in real-time, with no manual effort required. This module also allows for report customization, such as changing the report's layout, adding logos or branding elements, and selecting the type of data visualizations (e.g., pie charts, bar graphs). It ensures that the report is well-organized, professional, and tailored to meet the recipient's needs.

Key Features:

- Generates reports using predefined templates in various formats (PDF, Excel, CSV).
- Allows customization of report templates (branding, layout).
- Includes data visualization (charts, graphs, tables).
- Ensures consistency and uniformity in report formatting.

Benefits:

- Standardizes the report generation process.
- Improves the readability and understanding of reports through visual aids.
- Saves time by automating report creation, ensuring real-time updates.

Module 4: Email Automation and Distribution

The Email Automation and Distribution module is responsible for automatically sending the generated reports to the designated recipients. Once the report is created, the RPA bot uses an email client, such as Outlook or Gmail, to draft the email, attach the report, and send it to the recipients. This module eliminates the need for manual intervention in the emailing process, ensuring that reports are sent accurately and on time.

This module can be configured with a list of predefined recipients or allow dynamic recipient management based on the report's type or department. For example, if the report is related to sales, it can be automatically sent to the sales team, while an HR report can be sent to HR managers. Additionally, the module can handle scheduling, ensuring that emails are sent at the correct time, even outside working hours.

Key Features:

- Automatically drafts and sends emails with the report attached.
- Allows customization of email content (subject, body text).
- Supports dynamic recipient management based on report type or department.
- Handles email scheduling and time-zone adjustments.

Benefits:

- Automates the email distribution process, saving time and reducing errors.
- Ensures timely and consistent delivery of reports.
- Customizes email content based on the recipient's needs.

Module 5: Monitoring and Alerts

The Monitoring and Alerts module is designed to ensure the entire automated reporting process runs smoothly. This module tracks the status of each step, from data collection to email delivery, providing real-time monitoring and feedback. If any step encounters an issue (e.g., failed data retrieval, report generation failure, or email delivery issue), the system automatically triggers an alert to the administrator or the relevant stakeholders.

In addition to alerting the team to failures, this module can generate logs for auditing purposes, which help track errors and provide insights into system performance. Monitoring the process helps prevent issues from going unnoticed and ensures that corrective actions are taken quickly to minimize disruptions.

Key Features:

- Provides real-time status updates on the process flow.
- Sends alerts for failures or issues in any module.
- Generates logs for system performance tracking and troubleshooting.
- Provides detailed notifications to administrators or users.

Benefits:

- Improves system reliability by quickly identifying and addressing issues.
- Enables proactive management of the automation process.
- Enhances transparency by keeping track of the process flow and errors.

Module 6: User Interface

The User Interface (UI) module provides a graphical interface for interacting with the system. This module allows administrators and users to configure and manage the automated reporting process. Through the UI, users can define data source settings, schedule report generation, customize report templates, and manage email recipients. It provides a simple way to monitor the status of

reports and adjust configurations as necessary, without requiring direct interaction with the underlying system.

The UI is designed to be intuitive, offering easy access to key features and options for users who may not have technical expertise. It could include dashboards for monitoring the status of automated tasks and options for scheduling and customizing reports.

Key Features:

- Provides a user-friendly interface for managing system configurations.
- Allows users to schedule reports and set data source configurations.
- Customizes report templates, recipient lists, and email content.
- Displays real-time system status and report generation progress.

Benefits:

- Simplifies the management of the automated reporting process.
- Enhances user control over scheduling and customization.
- Reduces the need for technical expertise to operate the system.

CHAPTER 5

OUTPUT SCREENSHOTS

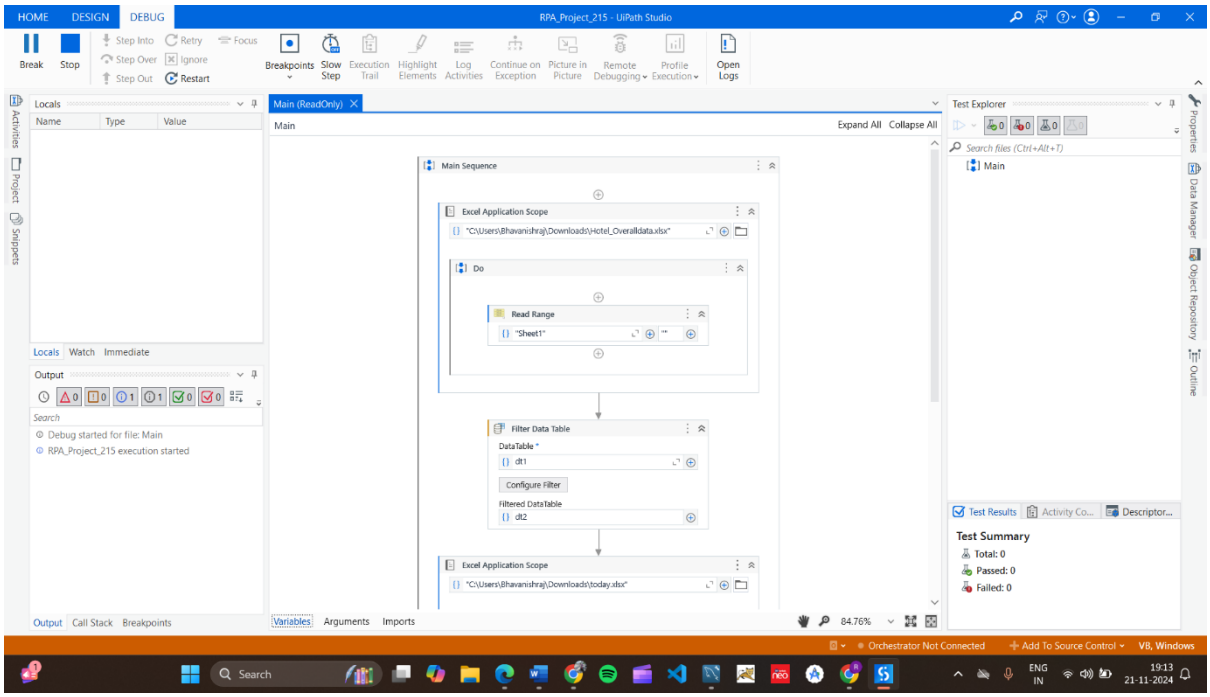


Fig 5.1

In Fig 5.1 – We have started to execute the workflow.

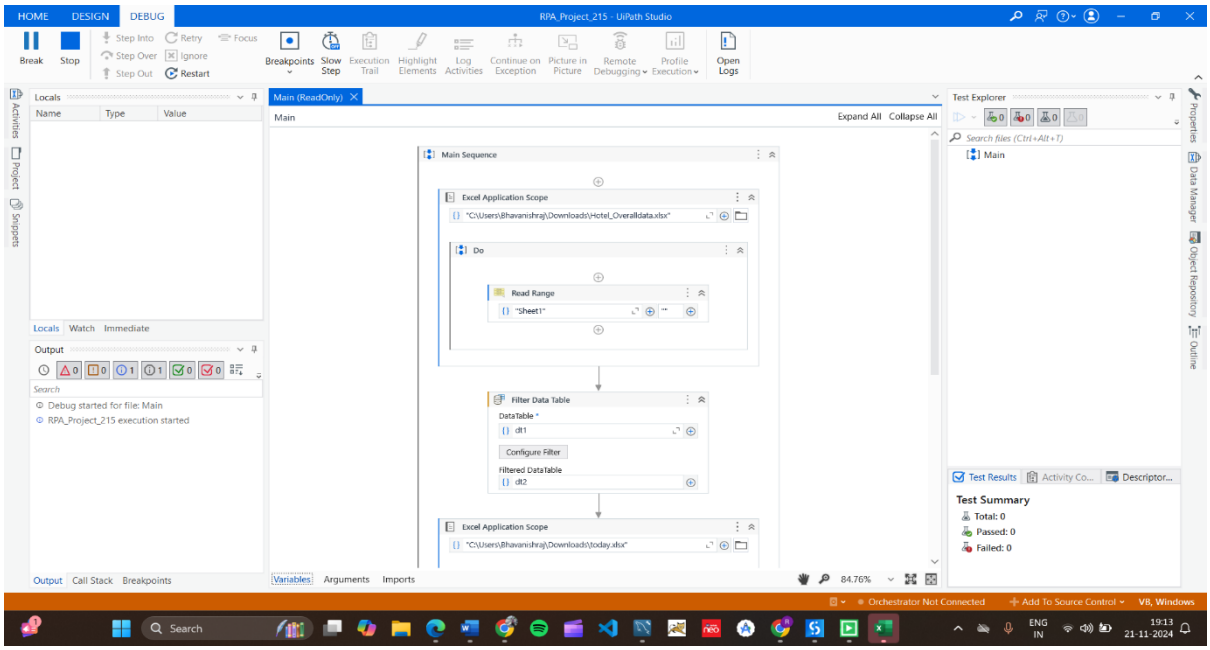


Fig 5.2

In Fig 5.2 – The excel is opened and filtered based on the date and mailed to reciepient.

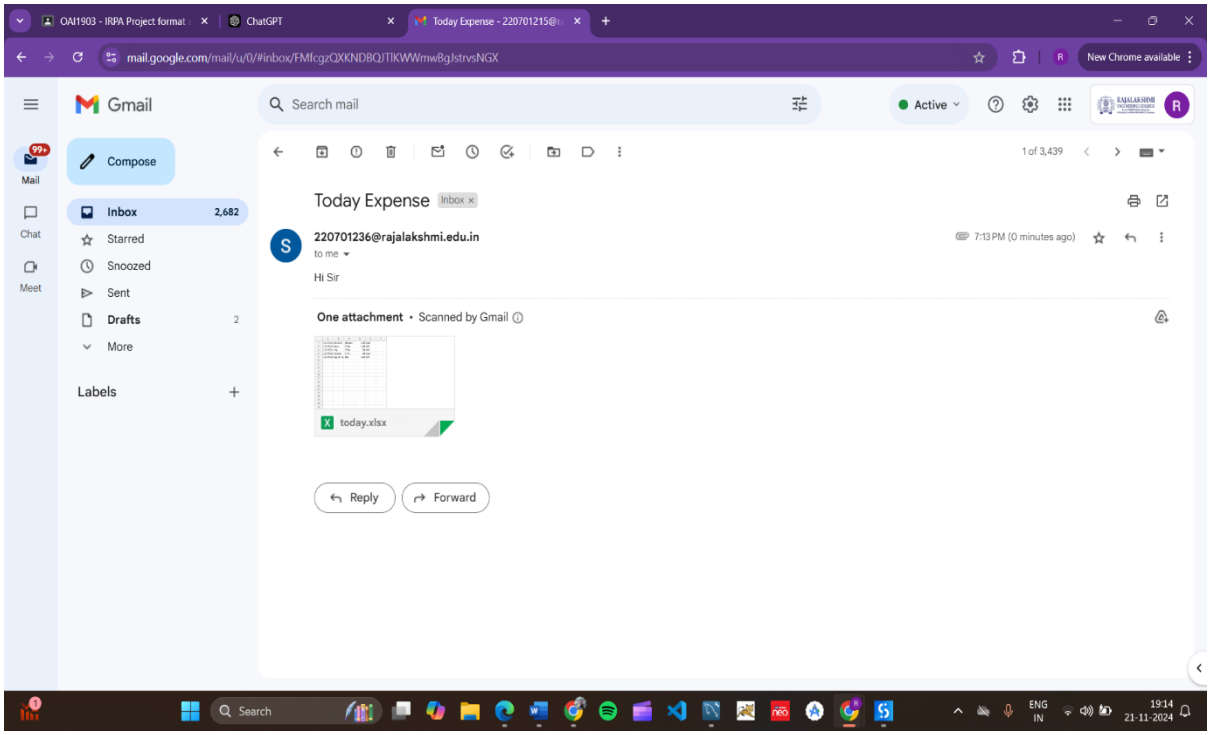


Fig 5.3

In Fig 5.3 – Mail has been sent to the recipient.

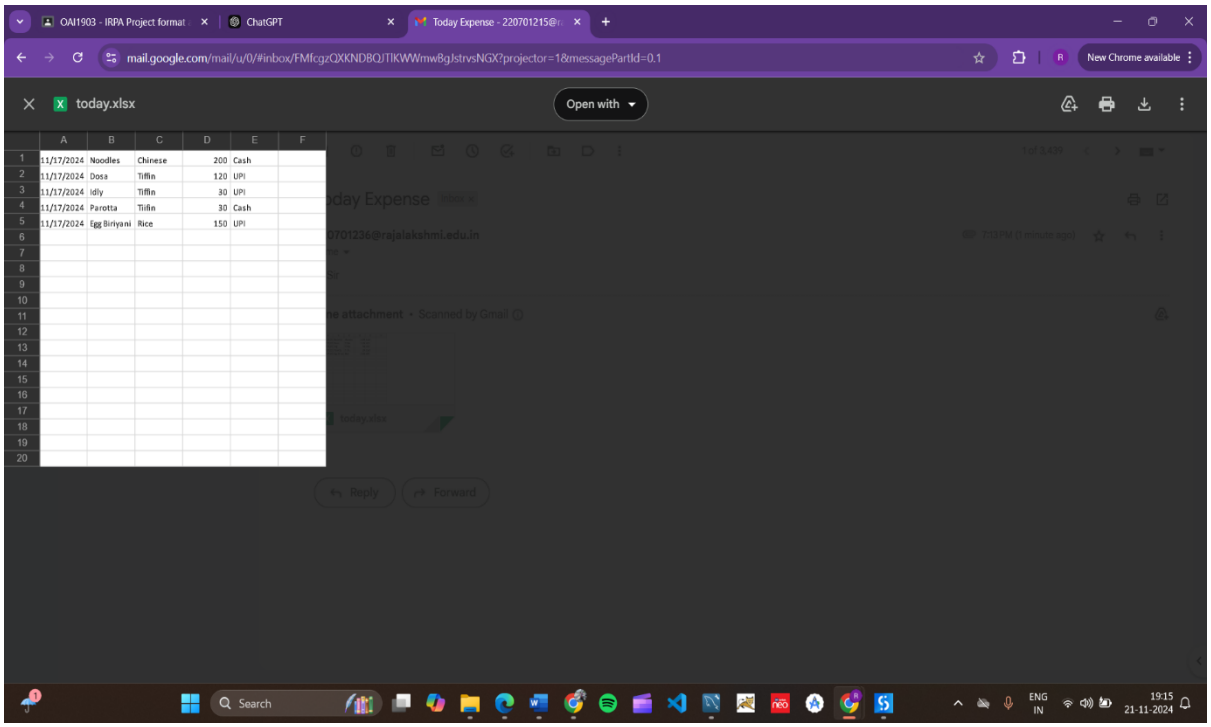


Fig 5.4

In Fig 5.4 – The filtered data is viewed.

CHAPTER 6

CONCLUSION

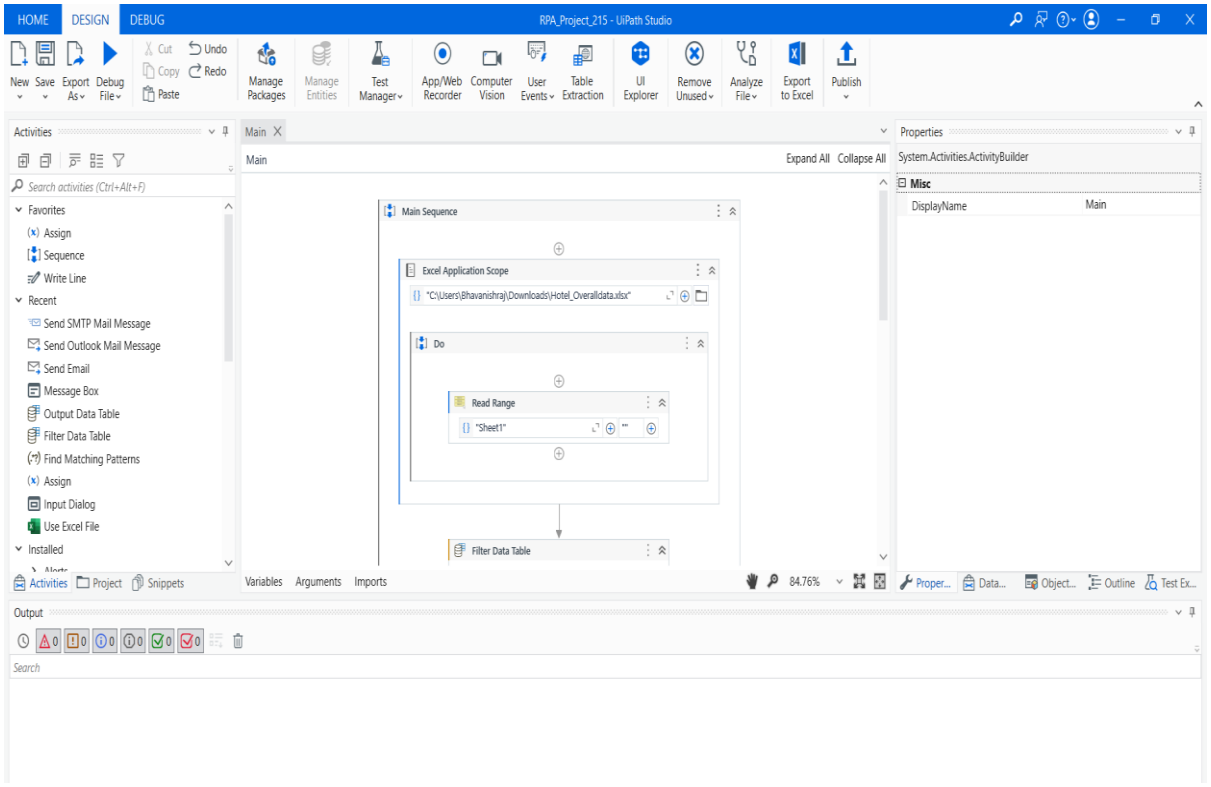
The automated daily report generation and distribution system, designed using Robotic Process Automation (RPA), offers a streamlined and efficient solution for organizations looking to reduce manual effort and ensure timely, accurate reporting. By breaking the process into well-defined modules, such as data collection, processing, report generation, email distribution, and monitoring, the system minimizes human intervention, thereby reducing errors and inconsistencies. Each module is tailored to handle specific tasks, ensuring that data is collected and processed efficiently, reports are generated in a standardized format, and recipients receive their reports promptly.

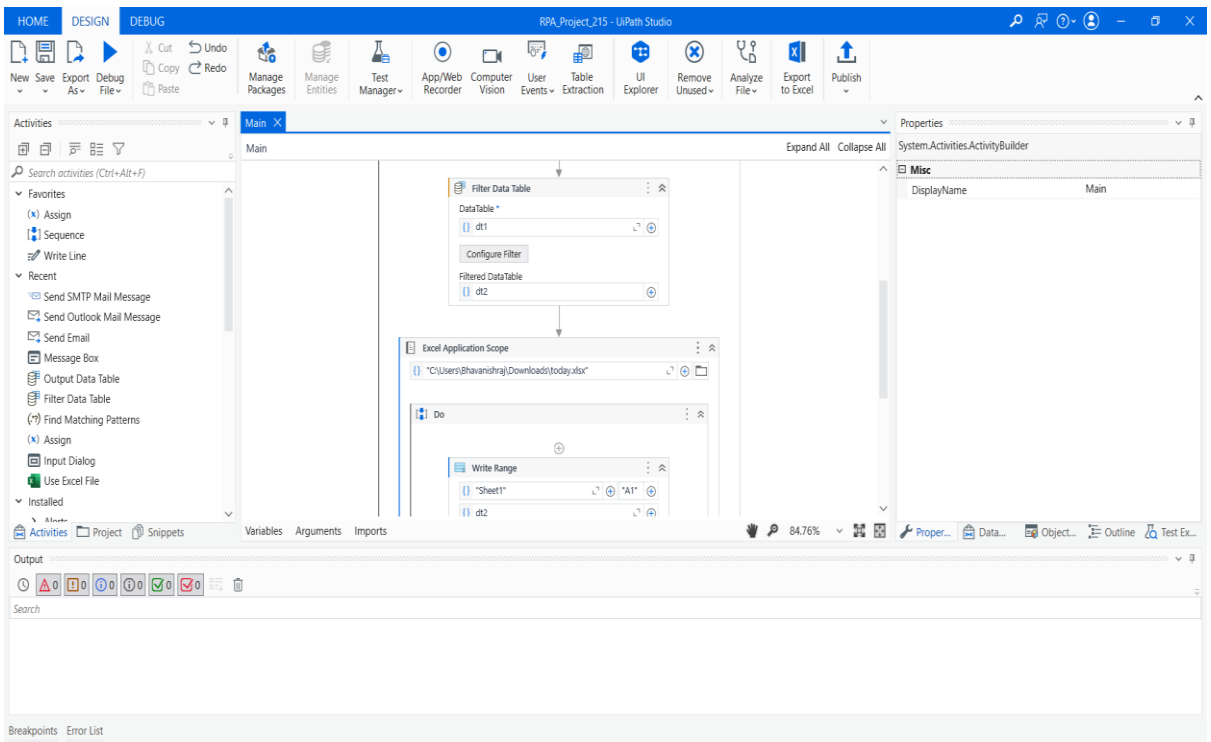
The automation of these processes not only saves time but also ensures that reports are consistent, reducing the risk of mistakes that often occur with manual methods. With the ability to monitor the system's performance and provide real-time alerts, organizations can proactively address any issues that arise, enhancing reliability and maintaining a smooth operation. Additionally, the inclusion of a user-friendly interface empowers administrators to easily manage and configure the system, ensuring flexibility and adaptability as organizational needs evolve.

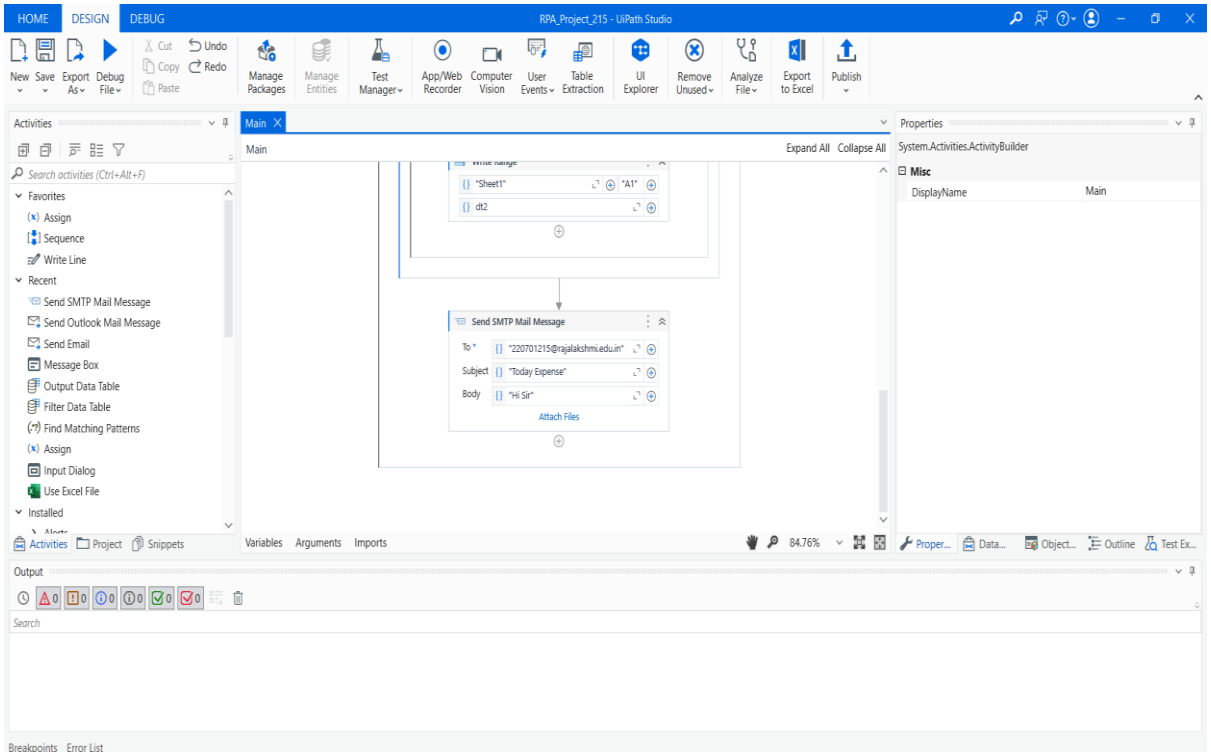
In conclusion, this RPA-based solution significantly enhances operational efficiency by automating repetitive tasks, improving the accuracy of reports, and ensuring that stakeholders have access to vital information on time. By eliminating manual work, organizations can focus more on strategic tasks, thus boosting overall productivity and enabling better decision-making.

APPENDIX

PROCESS WORK FLOW



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DESIGN
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Search activities (Ctrl+Alt+F)
Favorites
Assign
Sequence
Write Line
Recent
Send SMTP Mail Message
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Send Email
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"Today Expense"
Body
"Hi Sir"
Attach Files
Variables
Arguments
Imports
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Properties
System.Activities.ActivityBuilder
Misc
DisplayName
Main
Proper...
Data...
Object...
Outline
Test Ex...
Output
Search
Breakpoints
Error List

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