A Project Report on AUTOMATED EMAIL MANAGEMENT SYSTEM

Submitted by

Teena Shaik   (AP24122040002)

Piyush Keshari   (AP24122040004)

Ridhamkumar Thumar (AP24122040014)

Birat Chapagain   (AP24122040021)

SEC 502

Design Thinking

SRM University–AP

Neerukonda, Mangalagiri, Guntur

Andhra Pradesh – 522 240

Nov 2024

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1 Introduction

1.1   Purpose of the Project

The **Automated Email Management System** is designed to tackle the overwhelming challenge of managing high email volumes by introducing intelligent automation. The primary focus is to enable efficient email organization and streamline the deletion process using customizable criteria, such as:

- **Date** (e.g., deleting older emails beyond a certain threshold).
- **Email Source** (e.g., filtering promotional or irrelevant senders).

This system is highly beneficial for:

- **Busy professionals** who need to focus on essential communications without being distracted by clutter.
- **Organizations** that depend on structured and efficient email management to maintain operational productivity.
- **Diverse users** like small business owners, students, and senior citizens, each of whom face unique email management challenges.

1.2   Problem Statement:

Despite the growth of digital communication, many email platforms lack advanced filtering and deletion options that can help users manage their inboxes more effectively. Traditional email systems lack an intuitive way to automatically delete emails based on specific criteria like date or source. This becomes problematic as email volumes increase, resulting in inbox clutter that impacts user productivity.

1.3   Project Objectives

The **Automated Email Management System** is driven by the following objectives:

1. **Develop a streamlined email management tool** that incorporates:
   - **Date-based deletion:** Automatically remove outdated emails beyond a user-defined threshold.
   - **Source-based deletion:** Allow users to filter and delete emails from specific senders or categories (e.g., promotional content).
2. **Integrate intelligent filtering mechanisms** that:
   - Automatically categorize emails into priorities like essential, promotional, or informational.
   - Adapt to user behavior, improving categorization accuracy over time.
3. **Reduce the need for manual inbox management** by automating repetitive tasks, thereby increasing productivity for both individuals and organizations.
4. **Ensure a user-friendly interface** that simplifies customization and minimizes the learning curve, making the system accessible to a broad audience.

5. **Promote efficient email organization** for diverse user groups, including busy professionals, students, small business owners, and senior citizens.

1.4   Significance of the System:

Saving time and improving productivity by reducing manual email organization. Allowing businesses and individuals to focus on critical tasks rather than inbox management. Contributing to digital decluttering by removing outdated or irrelevant messages effectively.

2 Empathy:

2.1 2.1 Additional User Personas:

Purpose of Adding Additional Personas
Including additional user personas allows for a broader understanding of the diverse needs and challenges faced by different types of email users. This ensures the system is designed to be versatile and inclusive, catering to a wider audience beyond the initial target group of busy professionals. By considering small business owners, students, senior citizens, and freelancers, we can create a solution that is both adaptive and effective across varied use cases.

Why These Personas?

- **Small Business Owners:** Face unique challenges in managing customer communications, invoices, and supplier updates, requiring a system that prioritizes business-critical emails efficiently.
- **Students:** Often deal with a mix of academic and social emails, making it essential to separate urgent academic communications from clutter.
- **Senior Citizens:** Require a simple, user-friendly interface to manage their emails without feeling overwhelmed, while ensuring important messages aren't lost.
- **Freelancers:** Balance multiple client communications and project updates, needing an efficient tool to sort and prioritize emails related to their work.

By empathizing with these varied personas, the system can be fine-tuned to address specific pain points, ensuring its utility across different demographics and scenarios. This approach not only enhances user satisfaction but also broadens the potential market for the tool, making it more appealing and impactful.

2.2 Small Business Owners

- **Say**:
  "Managing customer and supplier emails is overwhelming. I can't afford to miss important updates or invoices buried in clutter."
  "I need an easier way to prioritize emails related to my business while filtering out unnecessary promotional content."
- **Think**:
  "I need a system that helps me quickly focus on business-critical emails without manual sorting."
  "An automated tool could save me time and prevent costly mistakes."
- **Feel**:
  Stressed about the constant influx of emails from customers, suppliers, and promotional channels.
  Anxious about missing important emails due to disorganized inboxes.
- **Do**:
  Use basic filtering or rules to sort emails but still struggle with managing the growing volume.

2.3 Students

- o **Say**:
  "My inbox is filled with emails from professors, class announcements, newsletters, and social media. It's a mess!"
  "I often miss deadlines because important emails get lost in the clutter."
- o **Think**:
  "There should be a way to prioritize emails related to academics without missing social opportunities."
  "If only I had a tool to separate emails by urgency or context automatically."
- o **Feel**:
  Frustrated by the lack of organization in their inboxes, which impacts their ability to stay on top of assignments and opportunities.
  Overwhelmed by the volume of emails, feeling they spend too much time managing them manually.
- o **Do**:
  Spend hours sorting academic emails from promotions and spam.
  Occasionally miss important emails due to inbox clutter.

2.4 **Senior Citizens**

- o **Say**:
  "I find it hard to organize emails. There's so much spam, and I don't understand how to use filters."
  "I want an easy way to clean my inbox without worrying about losing something important."
- o **Think**:
  "Email systems are too complicated, and I wish there was a simpler tool to manage everything for me."
  "I'm afraid of accidentally deleting something important, like family updates or medical information."
- o **Feel**:
  Intimidated by the complexity of current email management tools.
  Annoyed by the constant influx of promotional emails and phishing attempts.
  Hopeful for a straightforward solution that requires minimal technical knowledge.
- o **Do**:
  Ignore many emails due to fear of making a mistake while organizing them.
  Struggle with deleting or archiving emails effectively, leading to an overcrowded inbox.

2.5 **Freelancers**

- **Say:**
  "My inbox is flooded with project updates, client communications, invoices, and promotional emails. It's chaos!"
  "I need to focus on client emails without getting distracted by irrelevant messages."
- **Think:**
  "I wish I had a system that could separate client emails from everything else automatically."
  "Managing emails manually wastes time I could use for productive work."

- **Feel:**
  Stressed by the lack of order in their inbox, fearing they might overlook a client's request or deadline.
  Frustrated that they spend more time managing emails than focusing on projects.
- **Do:**
  Use multiple email folders but struggle to keep them updated as email volumes grow.
  Manually sort through emails daily to avoid missing critical updates.

Say	Think
Say	**Think**

I have too many old emails cluttering my inbox.

I wish there was an easier way to delete emails from specific senders.

Managing my emails manually is so time-consuming.

I need a tool that can automatically clean up my inbox.

There must be a more efficient way to manage my emails.

Why can't my email system automatically delete old or unwanted emails?

I spend too much time sorting through emails.

An automated solution would save me a lot of hassle.

User

Does

Manually delete emails one by one.

Create filters or rules to manage incoming emails.

Search for third-party tools or plugins to help manage emails.

Spend time organizing the inbox periodically.

Feels

Frustrated with the clutter in the inbox.

Overwhelmed by the volume of emails.

Annoyed by the inefficiency of current email management tools.

Hopeful for a solution that can automate the process.

Figure 1. Empathy Map

3 Storyboard for Automated Email Management System

3.1 Panel 1: Overflowing Inbox

Visual Elements: The scene shows an inbox icon, overwhelmed with a flood of email envelopes flying in from all directions. Some envelopes are visibly marked with symbols like exclamation points or "spam" tags, emphasizing disorganization.
Emotion: Chaos and frustration.
Color Scheme: A dominant blue for the inbox, contrasting with bright red and yellow envelopes to symbolize a high volume of unorganized emails. The background is white, highlighting the

clutter.
Caption: *"Sarah is overwhelmed by an inbox filled with numerous unread emails, making it difficult to find the important ones."*

3.2   Panel 2: AI-Powered Scanning

Visual Elements: A sleek, futuristic AI system scans through the overflowing emails. Glowing lines of light connect the emails, with certain messages highlighted in red or yellow to represent spam or irrelevant content.
Iconography: A magnifying glass or laser scanner effect adds a tech-oriented vibe, enhancing the AI's role in the process.
Color Scheme: Cool, calm blue and green tones dominate the scene, with bright red accents highlighting the spam and irrelevant emails.
Caption: *"The AI system intelligently scans and categorizes emails, identifying which ones are essential and which ones can be filtered out."*

3.3   Panel 3: Automatic Deletion

Visual Elements: Unwanted emails are shown moving towards a trash bin, with a smooth, flowing motion illustrated by arrows pointing from the inbox to the bin. Emails disappear into the trash, symbolizing the cleanup process.
Iconography: A classic trash bin symbol with animated lines representing emails vanishing into it, reinforcing the simplicity of the deletion process.
Color Scheme: The trash bin is a vibrant red, contrasting with the clean white emails being deleted, set against a neutral background.
Caption: *"The system automatically deletes irrelevant or outdated emails, decluttering Sarah's inbox without manual intervention."*

3.4 Panel 4: Organized Inbox

Visual Elements: Sarah's inbox is now minimalistic, with only a few important emails visible. A bold green checkmark floats over the screen, symbolizing success and order. The inbox is clean, and the design feels modern and efficient.
Iconography: The central green checkmark emphasizes completion and achievement, signifying a well-organized and manageable inbox.
Color Scheme: Bright green and white, conveying positivity, efficiency, and a sense of accomplishment.
Caption: *"Sarah's inbox is now clean and organized, leaving only the most important emails for her to focus on."*

3.5 Design and Aesthetic Considerations:

- **Overall Tone:** The storyboard follows a minimalist and professional aesthetic, ensuring the visuals clearly communicate the user journey.
- **Color Palette:** The use of blue and white as the foundation creates a sense of trust and technology, while red highlights unwanted elements (spam, deletions) and green signals success (organization, completion).
- **User Experience:** The progression from chaos to order visually represents the system's impact, emphasizing how it helps users regain control over their inboxes with minimal effort.

3.6 Define:

3.7 Point of View

Users:

- Busy professionals and individuals managing a high volume of daily emails.
- Small business owners balancing critical business communications with general email clutter.
- Students juggling academic, social, and personal emails while trying to stay organized.
- Senior citizens who find current email management tools overwhelming and need a simple, intuitive solution.

Needs:

- A system that intelligently categorizes and prioritizes emails, highlighting essential messages while filtering out irrelevant ones.
- Features for efficient inbox clean-up, such as date-based and sender-based deletion, without requiring complex configurations.
- A solution tailored to different user groups, accommodating diverse needs such as academic reminders for students or a simplified interface for senior citizens.
- A tool that learns from user behavior over time to adapt and improve email management efficiency.
- Minimal manual intervention to reduce the effort required to organize emails, making it accessible for all users.

Insights:

- **Busy Professionals:** Overwhelmed by email clutter, they lose productivity due to ineffective filtering and sorting tools. They require a smarter solution that prioritizes important emails automatically.
- **Small Business Owners:** Struggle with balancing time and effort in managing business-critical communications amid spam and irrelevant messages.
- **Students:** Miss deadlines and fail to keep track of important academic messages due to disorganized inboxes. They need a system that separates academic emails from other categories.
- **Senior Citizens:** Often find current tools too complex and fear accidental deletions. They need an intuitive system that provides automated sorting and protection for important communications.
- Across all groups, users express a strong need for an adaptable and predictive email management system that anticipates their needs and provides a clutter-free, easy-to-navigate inbox.

3.8 How Might We Questions

1. How might we automatically categorize and prioritize emails for diverse user groups, ensuring each user focuses only on their essential messages?
2. How might we simplify email deletion using intuitive date- and source-based filters to make inbox clean-up fast and user-friendly?

3. How might we design a predictive email management system that learns from user behavior to adaptively organize and prioritize emails over time?
4. How might we provide an easy-to-use system that meets the needs of different users, from busy professionals to senior citizens, with minimal technical effort?
5. How might we integrate additional user-specific features, such as academic reminders for students or simplified navigation for older adults, to ensure the system feels personalized and inclusive?

3.9   User Needs

1. **Efficient Email Categorization & Prioritization:**
   Users need a system that automatically categorizes and prioritizes incoming emails based on relevance, sender, and content, so they can focus on critical communications without sorting through irrelevant ones.
2. **Automatic Email Deletion:**
   Users require an easy-to-use feature to delete emails based on specific criteria, such as sender, date, or keyword. This will help declutter their inbox and remove outdated or unnecessary emails without complex setups.
3. **Minimal User Intervention:**
   The system should require minimal manual input, offering users the ability to quickly set preferences, after which the system should handle the majority of the work automatically.
4. **Predictive System:**
   Users want the system to learn from their behavior over time, adapting to their preferences and priorities for even better email management in the future.

3.10   User Insights

- **Challenges:**
  - Users feel overwhelmed by the high volume of emails, making it difficult to keep track of important messages.
  - Many users miss critical emails because they get buried under promotional or irrelevant ones.
  - Existing email management tools are either too basic, rigid, or require too much manual input, making them time-consuming.
- **Emotional Impact:**
  Users often feel frustrated, stressed, and anxious due to the constant influx of emails. The inability to effectively organize emails impacts their productivity and causes a sense of losing control over their inboxes.

3.11 Vision Cone:

Past
Manual Sorting and Basic Filtering: Historically, email users had to manually organize emails into folders or use basic rule-based filters. This process was time-consuming and limited, often leading to missed important emails amid clutter.

Present
Automated Filters and Rules: Email clients now offer rule-based filters, allowing users to filter incoming emails based on sender, subject, or keywords. However, thesefilters lack adaptability and intelligence, and they require frequent updates from users.

Near Future
AI-Driven Categorization and Smart Deletion: Our system will introduce AI- powered categorization, automatically learning user preferences and adjusting categorization based on behaviour. Features like date and source-based deletion will allow users to set specific rules for clearing out emails, creating a more organized inbox without the need for manual management.

Future
Predictive and Adaptive Management: Our ultimate goal is to achieve a predictive management system that leverages user behaviour analytics to autonomously organize, categorize, and prioritize emails. The system will anticipate user needs, intelligently prioritizing crucial emails and archiving or deleting irrelevant ones, offering a completely automated inbox experience.
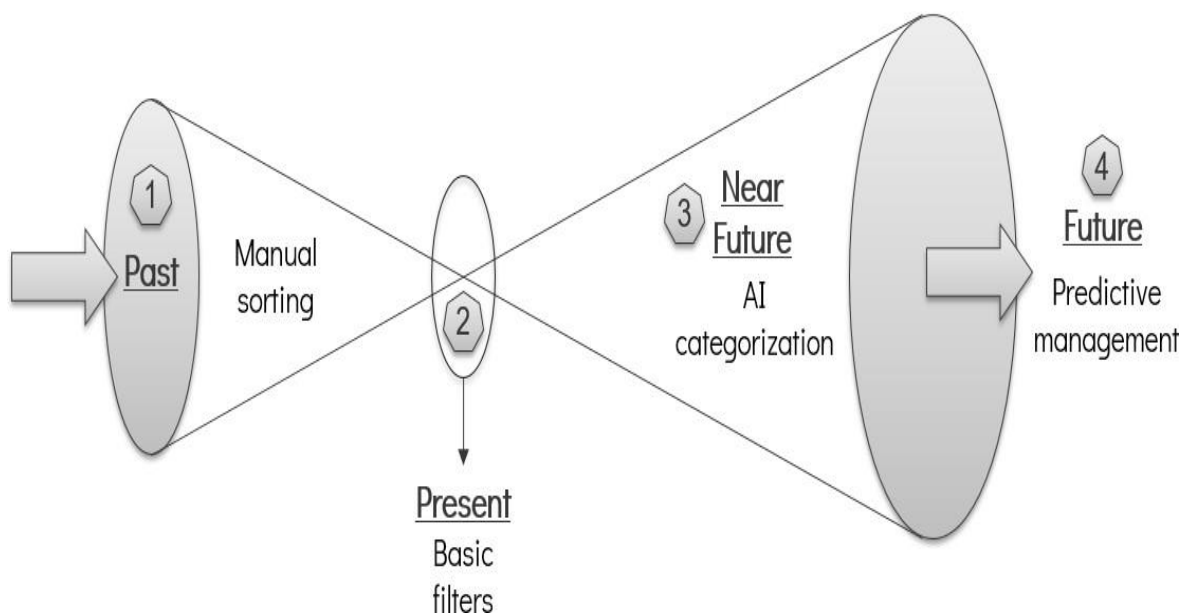

Figure 2. Vision Cone

4 Ideation

Using Brain Storming Tool

To address the challenges of efficient email management, we employed brainstorming techniques to generate diverse and innovative solutions, focusing on automation, user customization, and intelligent filtering to streamline the process of date-based and source-based email deletion.

1. **Automated Email Filters with Deletion Rules**:

   - Users can create custom filters based on criteria such as date range, sender, subject keywords, or content.
   - Emails that meet these criteria are either deleted immediately or after a specified period.
   - This filter system could include "deletion scheduling" for automatic removal at a later date, helping users maintain a cleaner inbox without manual intervention.
   - It could also have a review option, where users review filtered emails before final deletion, minimizing the risk of deleting important messages.

2. **AI-Powered Email Sorting and Clean-up**:

   - Uses machine learning to analyse email patterns and categorize emails (e.g., promotions, social media, transactional, and personal emails).
   - The system can learn user preferences to identify emails that are typicallyignored or unimportant.
   - Based on these insights, users receive suggestions for bulk deletion, withoptions to delete by category or priority level.
   - This system could continually improve based on user feedback, making the clean-up process more efficient over time.

3. **Date-Based Batch Deletion Tool**:

   - Provides a visual calendar interface where users can view and select emailsfrom specific dates or date ranges.
   - Users can quickly identify older emails and select groups of emails for bulk deletion, rather than manually searching for outdated messages.
   - The interface might show email volume by day, week, or month, enabling usersto identify "cluttered" periods.
   - It simplifies managing storage by making it easy to delete emails after a certain timeframe (e.g., older than six months or a year).

4. **Source-Based Bulk Deletion**:

- This tool allows users to select and delete emails from specific sources, such as domains, newsletters, or senders.
- Users can choose entire categories or sender domains, like promotions or social media notifications, to delete in bulk.
- An option to block or unsubscribe from specific senders directly from this interface could also be added, preventing future clutter from those sources.
- The tool might also include a "safe list" for contacts and important senders, ensuring no important emails are accidentally removed.

   5. **Smart Archiving with Expiry Dates**:

- Users can assign an expiration date to emails, such as promotions or low- priority messages, when they're received.
- These emails are archived in a separate folder and automatically deleted once the expiry period is reached.
- Allows users to access emails temporarily without worrying about long-term storage or clutter.
- The system could also provide reminders about archived emails nearing expiration, letting users decide if they want to keep or delete them before the expiry date.

4.2 4-3-5 Method

The **4-3-5** method was employed to generate more structured and diverse ideas. Here's how it was implemented:

Process:

- **4 Participants:** A diverse group including professionals, students, and small business owners.
- **3 Ideas Each:** Each participant contributed three ideas addressing specific challenges in managing emails.
- **5 Rounds:** Ideas were iterated upon in five rounds, with each participant building on the ideas of others.

Generated Ideas:

1. **Smart Filters:**
   - Auto-labeling for categories like "Work," "Personal," or "Promotions."
   - Advanced spam filtering to reduce irrelevant messages without accidental loss of important emails.
   - "Do Not Disturb" settings for certain email types during focus hours.
2. **Priority Dashboard:**

- A dashboard highlighting only the most critical emails with tags like "Action Required" or "Follow-Up."
- Color-coded priority indicators based on deadlines or senders.
- Suggestions for quick replies to high-priority emails.

3. **Behavioral Insights:**
   - AI tracking patterns like response times and interaction frequency to identify key senders.
   - Recommendations for archiving or deleting emails based on user habits.
   - Summary emails with highlights of the day's most important messages.

4. **Simplified Cleanup Tools:**
   - Drag-and-drop folders for instant organization.
   - Bulk deletion suggestions for outdated emails or seldom-used categories.
   - Visualization of inbox size and clutter hotspots to motivate cleanup.

5. **User-Specific Features:**
   - **Students:** Calendar integration for academic deadlines and reminders.
   - **Small Business Owners:** Expense tracking integration from invoice emails.
   - **Senior Citizens:** Read-aloud functionality for accessibility and reassurance for managing sensitive emails.

6. **Predictive Systems:**
   - AI suggesting auto-responses for frequently received emails.
   - Pre-emptive alerts for emails likely requiring user attention soon.
   - Inbox temperature indicating how organized or cluttered the inbox is.

5 Prototype

5.1 Detailed Workflow Steps:

1. **Initialize the Process:**
   o **Select and Install UiPath's Mail Activities Package**: Ensure the relevant mail activity package (Outlook, Gmail, or IMAP/SMTP) is installed in the project to manage email activities.
   o **Set Up Email Connection**:
     ▪ Use the **Get App Credentials** activity for secure retrieval of stored credentials from **UiPath Orchestrator** or **Windows Credential Manager**.
     ▪ Configure the **Mail Activity** (e.g., **Outlook Application Scope** or **IMAP/SMTP Activity**) with these credentials to establish a secure connection.

2. **Retrieve Emails:**
   o **Get Mail Messages Activity**:
     ▪ Use the **Get Mail Messages** activity to pull a list of emails from the inbox or specific folders.
     ▪ Configure filters such as **date range**, **unread status**, or **folder location** to narrow down the search results.
     ▪ Example: Retrieve only emails older than a specified date or emails marked as unread.

3. **Filter Emails:**
   o **Iterate Through Emails**:
     ▪ Implement a **For Each** loop to go through each email in the retrieved list.
     ▪ Apply filtering conditions within the loop using **If conditions** to identify emails that match specified criteria (e.g., subject keywords, sender domains).
   o **Custom Logic for Filtering**:
     ▪ Example: If email.Subject.Contains("Promotion") Or email.Sender.Address.EndsWith("@newsletters.com")

4. **Delete Emails:**
   o **Delete or Move Emails**:
     ▪ Use the **Delete Email** activity within the **For Each** loop for emails that meet the filtering criteria.
     ▪ Optionally, instead of permanent deletion, use the **Move Mail Message** activity to move unwanted emails to a designated folder (e.g., **Trash** or **Archive**).
   o **Ensure Reversible Action**:
     ▪ Keep emails in a temporary trash folder to prevent accidental deletion until the user confirms permanent removal.

5. **Logging and Reporting:**
   o **Log Email Details**:

- Use **Log Message** or **Write Line** activities to log details (e.g., sender, subject, date) of deleted or moved emails for auditing purposes.
- Format: Log Message - "Deleted email from: [email address], Subject: [subject], Date: [date]"

- **Generate a Report**:
  - Use the **Build Data Table** activity to create a structured log of deleted emails.
  - Populate the data table within the loop and export it using the **Write CSV** activity to generate a report for transparency and future reference.

5.2 Workflow Diagram Overview:

- Start Process →Get Emails →Filter Emails →Delete/Move Emails →Log Actions →Generate CSV Report →End Process

5.3 Process for Execution

1. Set Up UiPath Studio
2. Install Packages:
   Open UiPath Studio and go to Manage Packages.Install UiPath.Mail.Activities.
3. Connect to Email:
   Add the Get IMAP Mail Messages or Get Outlook Mail Messages activitybased on the email service.
4. Configure the activity:
   Server Details: IMAP/SMTP server details (e.g., imap.gmail.com for Gmail).
   Authentication: Provide username and app-specific password (if required).
5. Publish to UiPath Orchestrator (Cloud)
6. Publish Project:
   Once the workflow is tested and finalized, publish it from UiPath Studio toUiPath Orchestrator.
7. Create a Process:
   - In UiPath Orchestrator:
     Go to Processes and create a process by linking the published package.
   - Set Up Triggers:
     Define triggers (e.g., time-based, queue-based, or new email trigger).
     Use Triggers in UiPath Orchestrator to schedule the process.

5.4 Prototype Development

Based on the ideas generated during the ideation phase, we created prototypes to test the feasibility and effectiveness of the solutions:

- **Interactive Dashboard:** A visual prototype showcasing categorized and prioritized emails with color-coded urgency indicators.
- **Smart Cleanup Tool:** A clickable prototype simulating date-based and sender-based email deletion.

- **Behavior-Based Features:** Mock-up showcasing unsubscribe suggestions, email summaries, and archiving recommendations.

5.5 User Testing

To validate the prototypes, we conducted user testing with a diverse group of participants, including busy professionals, students, small business owners, and senior citizens.

- **Feedback Highlights:**
  - **Professionals:** Found the priority dashboard highly effective for time management.
  - **Students:** Appreciated auto-tagging of assignment deadlines and exam schedules.
  - **Small Business Owners:** Valued invoice tracking and integration with calendars.
  - **Senior Citizens:** Liked the accessibility options, especially read-aloud features.
- **Challenges Identified:**
  - Over-reliance on AI for categorization could lead to occasional misclassification.
  - Some participants wanted more control over customization.
- **Improvements Implemented:**
  - Added manual override options for email categorization.
  - Enhanced onboarding to guide users through the customization process.
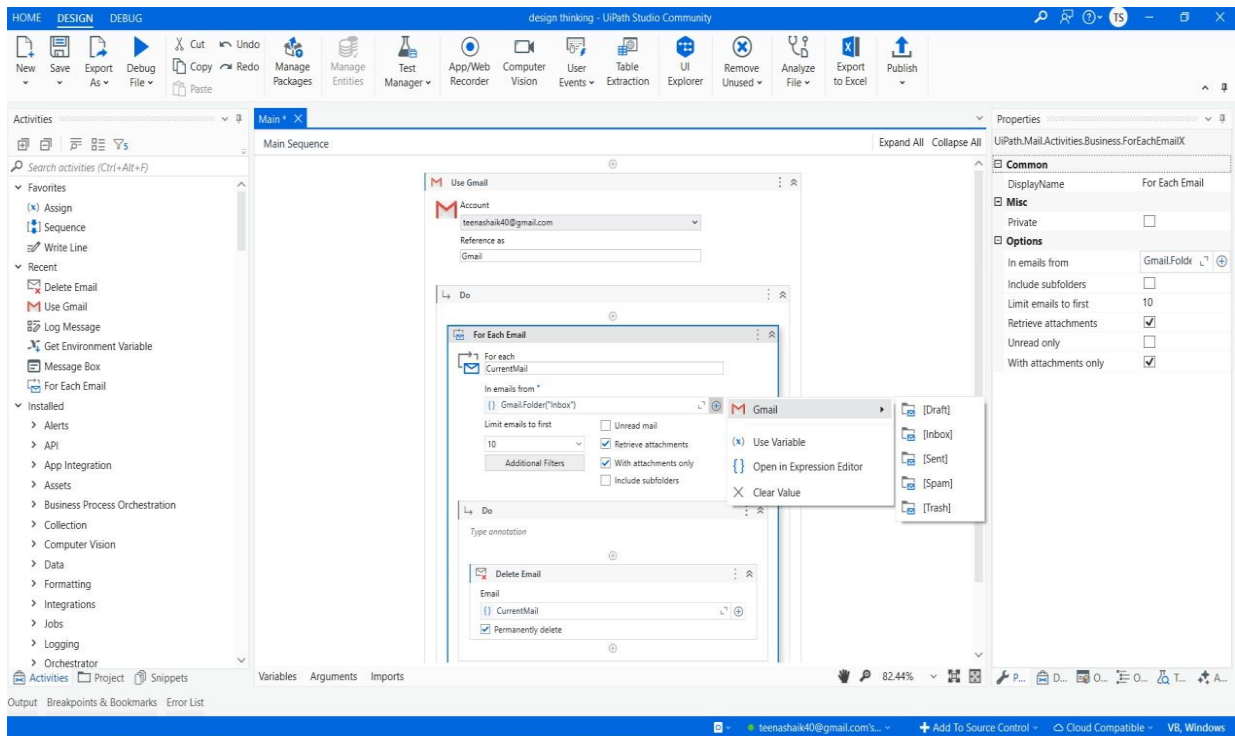
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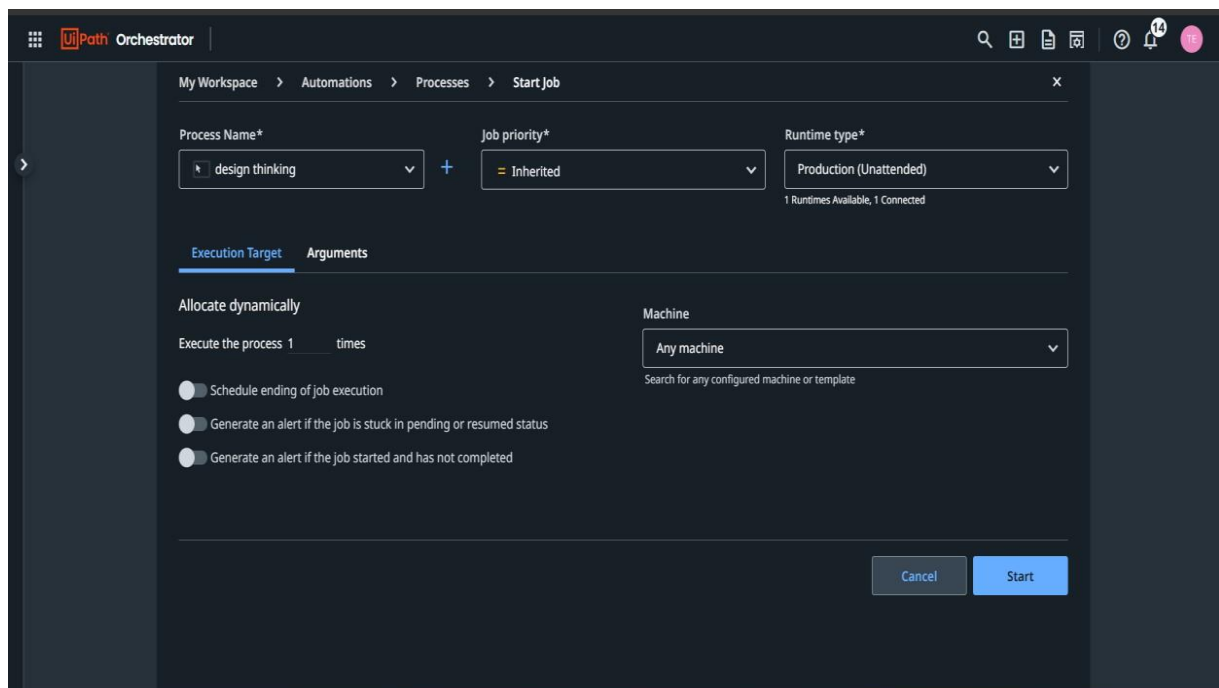

Figure 3. UiPath studio setup

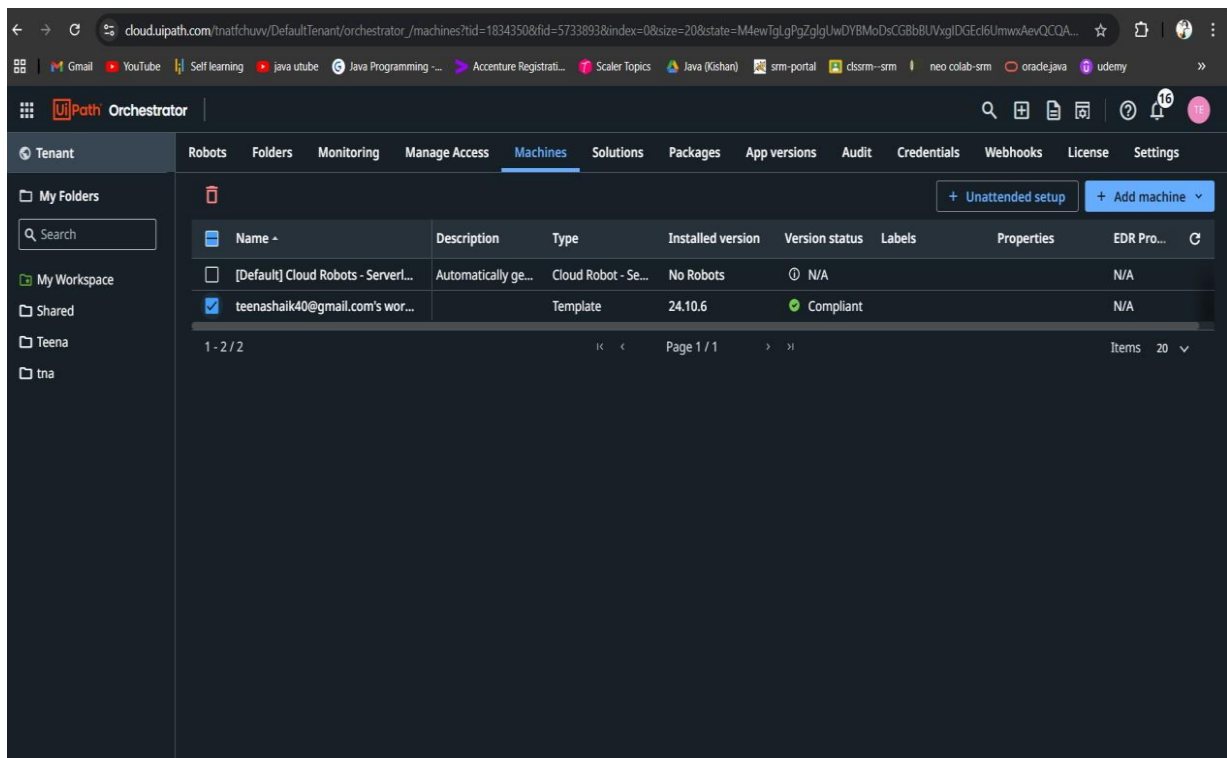**Figure 4.** To connect orchestrator by using cloud.uipath.com
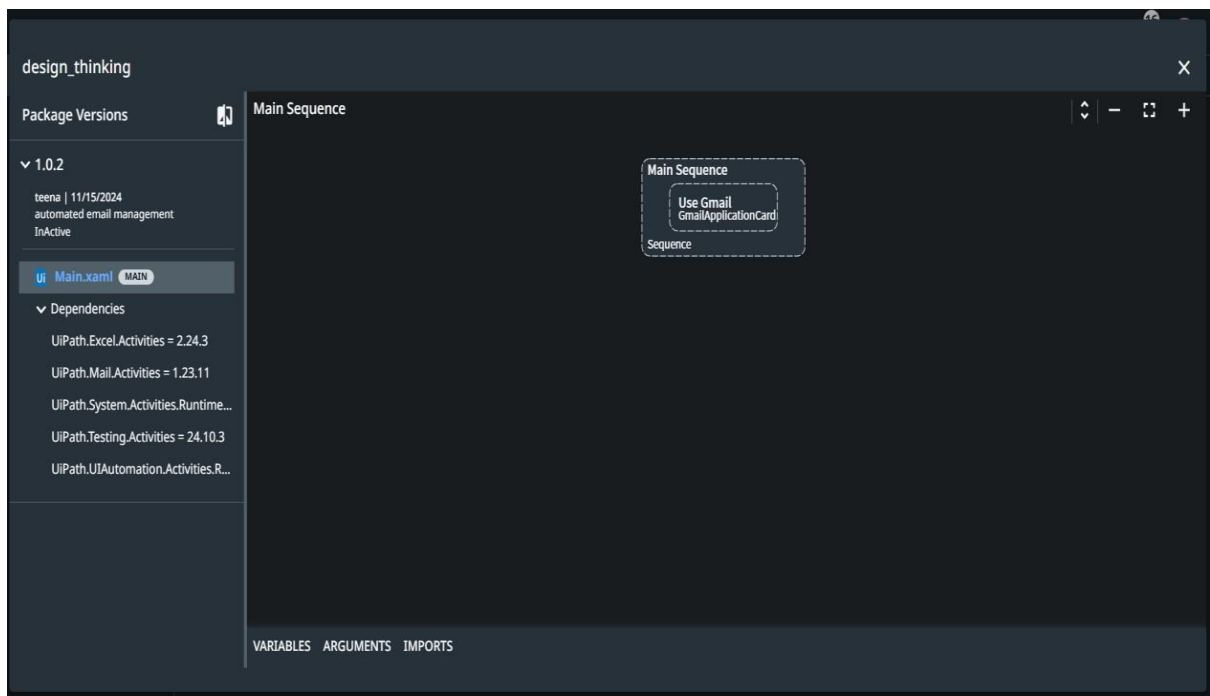
Figure 5. Process status recived the machine

Figure 6. Done process
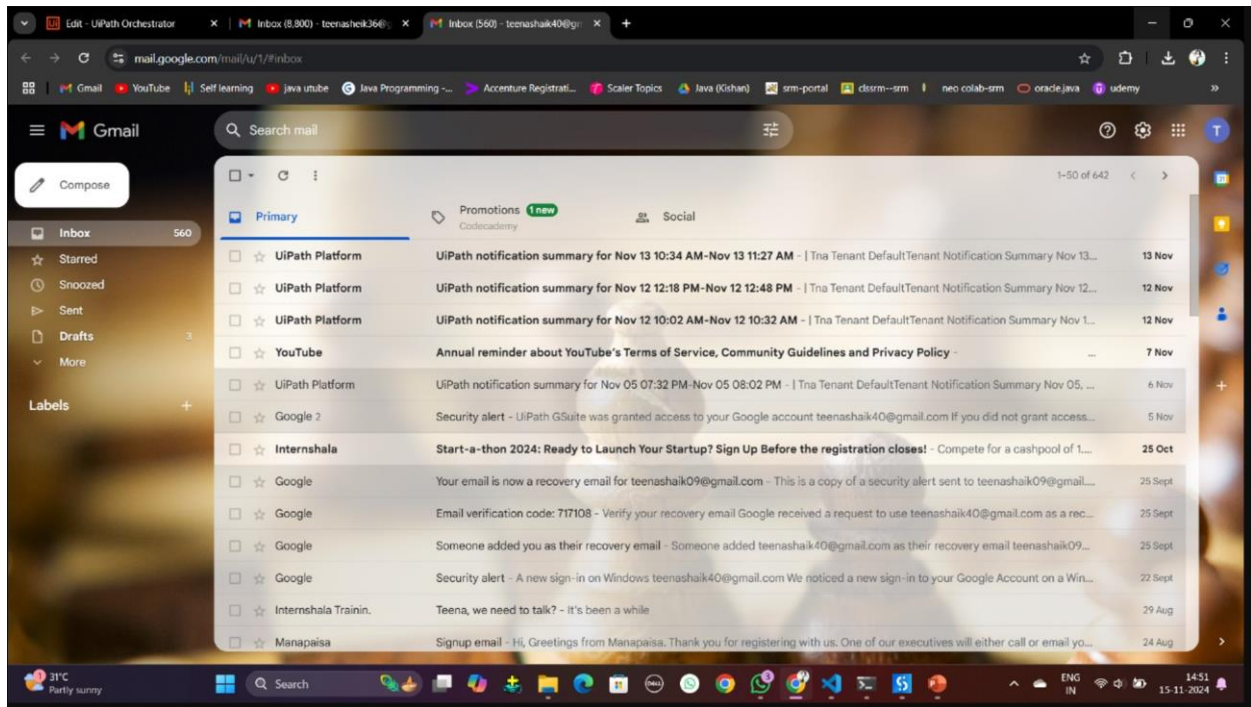
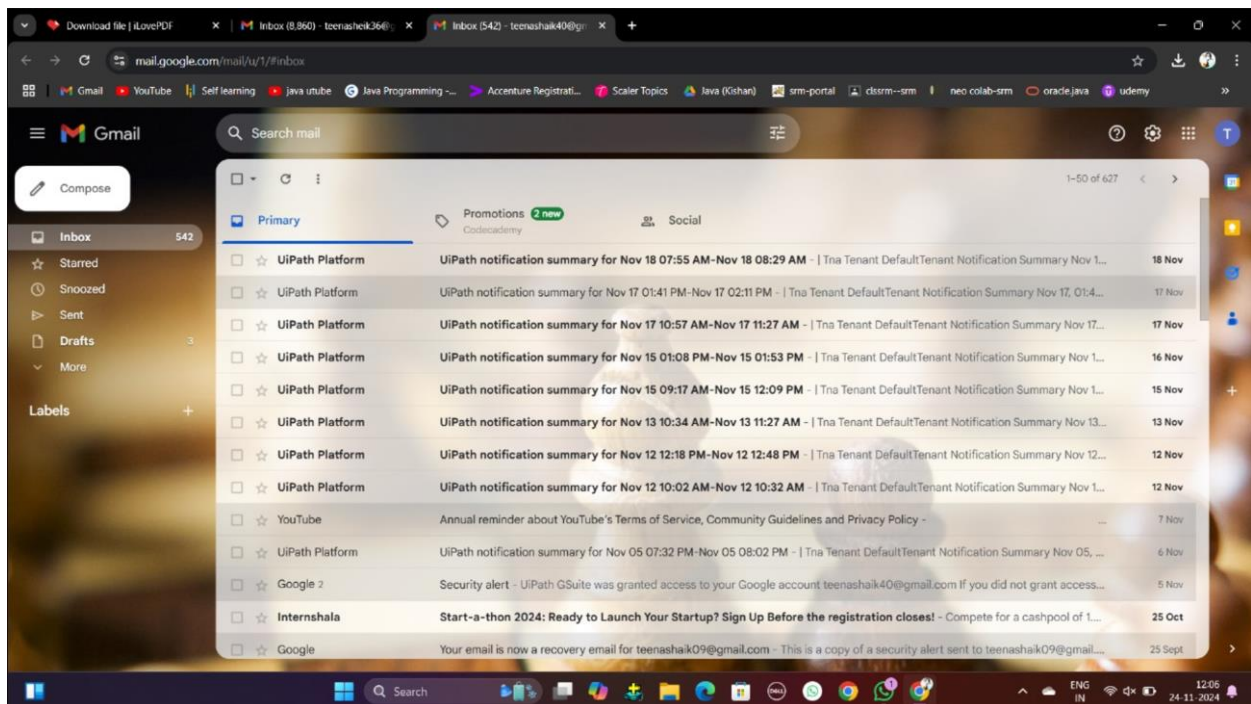**Figure 7.** Mail **inbox** before the deletion

Figure 8. Mail **inbox** After the deletion

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6   Conclusion

The **Automated Email Management System** addresses the pressing challenges of modern email overload by introducing intelligent and adaptive automation. Through features like date-based and source-based deletion, AI-driven categorization, and smart archiving, the system offers users an efficient and user-friendly way to manage inbox clutter. This project demonstrates a significant improvement over traditional email management systems by integrating automation and machine learning, thereby enhancing productivity and reducing manual effort. By effectively utilizing tools like UiPath, the project also highlights the potential of automation platforms in implementing scalable solutions. Ultimately, this system can be a valuable tool for busy professionals and organizations looking to streamline communication and focus on critical tasks.

6.1.1   Future Works and Improvements

1. **Enhanced AI Models for Categorization and Prediction:**
   Integrate more sophisticated AI algorithms, such as deep learning-based Natural Language Processing (NLP) models, for better email categorization and predictive prioritization. This could include sentiment analysis and semantic understanding to classify emails based on urgency or importance.
2. **Real-Time Notification and Feedback System:**
   Implement a notification system that provides real-time suggestions or alerts about important emails, such as reminders for unread messages from key contacts. Include feedback loops to refine the AI model based on user preferences.
3. **Cross-Platform Integration:**
   Expand the system's compatibility to support multiple email platforms (e.g., Gmail, Outlook, Yahoo) and integrate it with enterprise communication tools like Slack or Microsoft Teams.
4. **Privacy and Security Enhancements:**
   Ensure end-to-end encryption and implement compliance with data protection regulations like GDPR to enhance the security and trustworthiness of the system.
5. **Customizable User Interface:**
   Design an intuitive dashboard where users can easily view email statistics, manage filters, and monitor automated actions. Include visual elements like charts and heatmaps for clutter analysis.
6. **Localization and Accessibility:**
   Offer multi-language support to cater to diverse user bases and implement features for accessibility, such as screen reader compatibility and customizable font sizes.
7. **Spam and Phishing Detection:**
   Incorporate AI-based spam and phishing detection algorithms to enhance email security. This would ensure that harmful emails are flagged or quarantined before reaching the inbox.
8. **Eco-Friendly Features:**
   Add metrics to track and visualize storage savings and the environmental benefits of email decluttering (e.g., reduced energy usage from servers).

9. **Mobile Application:**
   Develop a mobile app version of the system for on-the-go access and seamless management across devices.

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