EMAIL METAMORPH

A PROJECT REPORT

Submitted by

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BONAFIDE CERTIFICATE

Certified that this project report **" EMAIL METAMORPH"** is the bonafide work of **"YOGESH CV (220701327)"** who carried out the project work for the subject OAI1903-Introduction to Robotic Process Automation under my supervision.

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INTERNAL EXAMINER **EXTERNAL EXAMINER**

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ABSTRACT

In today's fast-paced digital environment, managing email attachments efficiently is critical for businesses and individuals alike. Manual sorting and organizing of email attachments can lead to inefficiencies, errors, and lost productivity. This project, **Email Metamorph**, leverages Robotic Process Automation (RPA) using UiPath to automate the process of downloading, categorizing, and storing email attachments into dynamically created folders named after the senders. The system identifies different file types and segregates them into subfolders based on their extensions, ensuring systematic organization and easy retrieval. This automation reduces manual intervention, minimizes errors, and enhances overall productivity. The project demonstrates the potential of RPA in streamlining email management processes and offers a robust solution for businesses dealing with high volumes of email attachments.

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LIST OF ABBREVIATIONS

ABBREVIATION	ACRONYM
B.E.	Bachelor of Engineering
M.Tech.	Master of Technology
Ph.D.	Doctor of Philosophy
RPA	Robotic Process Automation
AI	Artificial Intelligence
IMAP	Internet Message Access Protocol
CRM	Customer Relationship Management

CHAPTER 1

INTRODUCTION

1.1 BACKGROUND

Robotic Process Automation (RPA) has revolutionized how repetitive and rule-based tasks are managed in organizations. By mimicking human actions on digital systems, RPA enables businesses to achieve higher efficiency and accuracy. Email Metamorph leverages RPA to automate the organization of email attachments, ensuring that files are systematically stored and easily accessible.

1.2 PROBLEM STATEMENT

Manually managing email attachments is a tedious and error-prone task for many organizations. Employees spend significant time sorting through emails, extracting attachments, and organizing them into folders. This manual process leads to inefficiencies, misfiled documents, and delays in accessing critical information, particularly with high email volumes. An automated solution is needed to efficiently handle and organize email attachments, ensuring they are correctly categorized and easily retrievable. This solution should reduce human intervention, minimize errors, and improve overall productivity by automating the extraction, folder creation, and file categorization processes.

1.3 PROJECT OBJECTIVES

1. The primary goal of Email Metamorph is to automate the management of email attachments. By reading incoming emails, the system will:
2. Automatically download and extract email attachments.
3. Dynamically create folders named after the sender's email address.
4. Segregate attachments into subfolders based on their file types.

5. Minimize human errors and improve efficiency in handling email attachments.

1.4 SCOPE OF THE PROJECT

The scope of the **Email Metamorph** project encompasses the development and implementation of an automated system to manage email attachments efficiently. Key aspects include:

1. **Email Retrieval**:
    - Automate the connection to email servers using IMAP/POP3 protocols to fetch emails with attachments.
2. **Attachment Extraction**:
    - Automatically extract attachments from incoming emails and save them to a temporary storage location.
3. **Dynamic Folder Creation**:
    - Create folders dynamically based on sender email addresses to organize attachments systematically.
4. **File Categorization**:
    - Identify and categorize attachments into subfolders according to their file types (e.g., PDF, JPG, DOC).
5. **Logging and Monitoring**:
    - Implement detailed logging for tracking all actions, including email retrieval, attachment extraction, folder creation, and file categorization.
6. **User Interface**:
    - Develop a user-friendly interface for configuration and monitoring of the system.

7. **Scalability**:
    - Ensure the system can handle increasing volumes of email traffic and attachments.
8. **Security**:
    - Incorporate security measures to protect sensitive email data and attachments.

The project aims to streamline the process of managing email attachments, reducing manual effort, minimizing errors, and enhancing overall productivity for businesses and individuals.

1.5 LIMITATIONS

Email Server Dependence:

Requires consistent access to email servers using IMAP/POP3, which may face connectivity issues.

File Type Handling:

Limited to predefined file types; may need updates to handle new or uncommon extensions.

Attachment Size:

Performance can be impacted by large attachments, requiring robust handling mechanisms.

Error Handling:

Unforeseen errors in email parsing or file categorization might require manual intervention.

CHAPTER 2

LITERATURE REVIEW

2.1 GENERAL

Automation technologies, particularly RPA, have seen significant adoption in email management systems. Studies highlight that organizations using automated solutions experience improved efficiency and reduced errors. This chapter reviews the existing literature on automation in email management

2.2 RELATED WORKS

1. RPA in Email Processing: Several case studies emphasize how RPA tools like UiPath and Blue Prism are used to handle email-based workflows efficiently.

2. Text Classification for files: Research on natural language processing (NLP) has explored AI-based methods for ticket categorization, but RPA offers a simpler, rule-based alternative for small to medium-sized organizations.

3. Comparative Analysis: Manual vs. automated systems for file reveals that automation drastically reduces processing time, ensuring files are routed correctly

CHAPTER 3

SYSTEM DESIGN

3.1 SYSTEM FLOW DIAGRAM

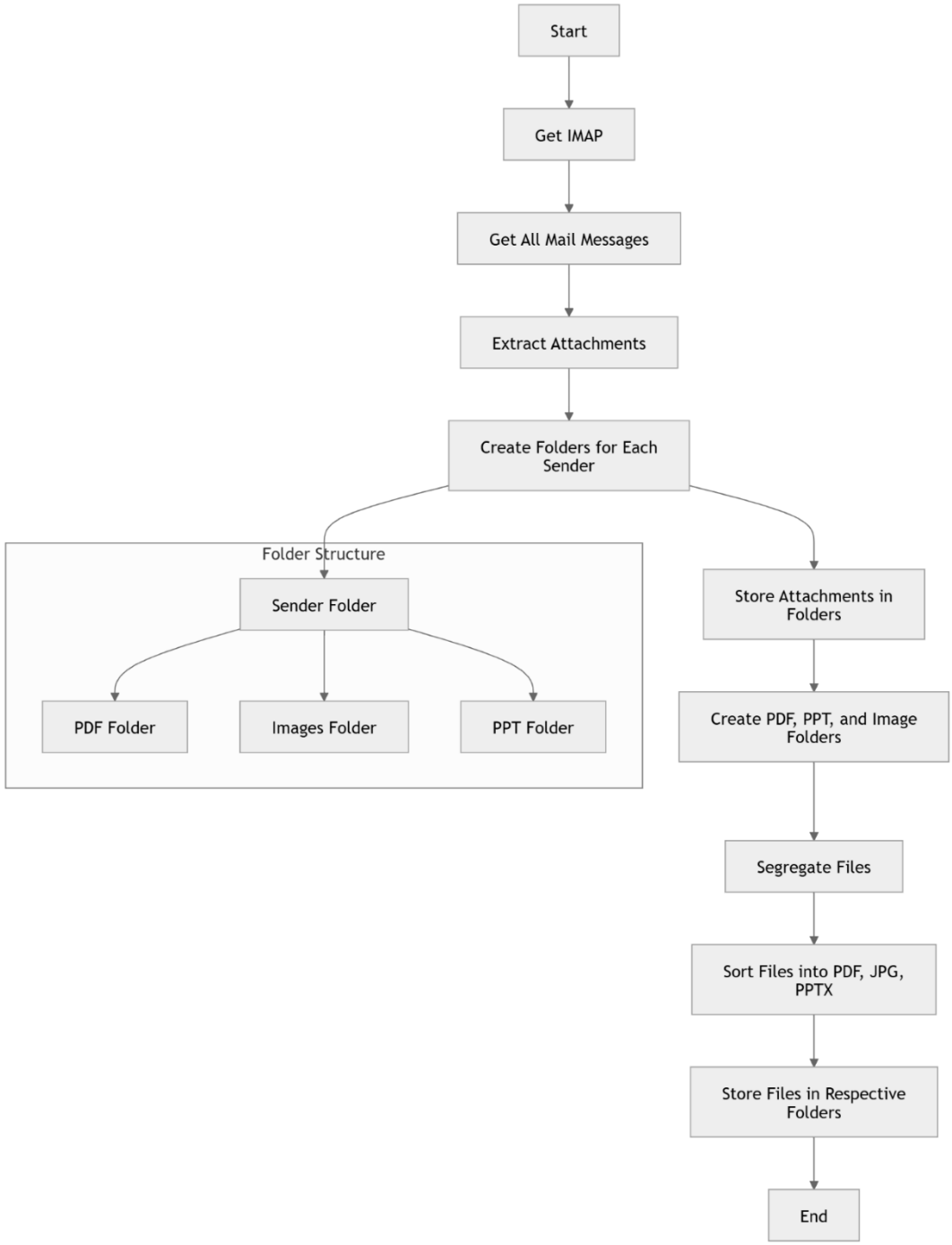


FIG 3.1 SYSTEM FLOW DIAGRAM

3.2 ARCHITECTURE DIAGRAM

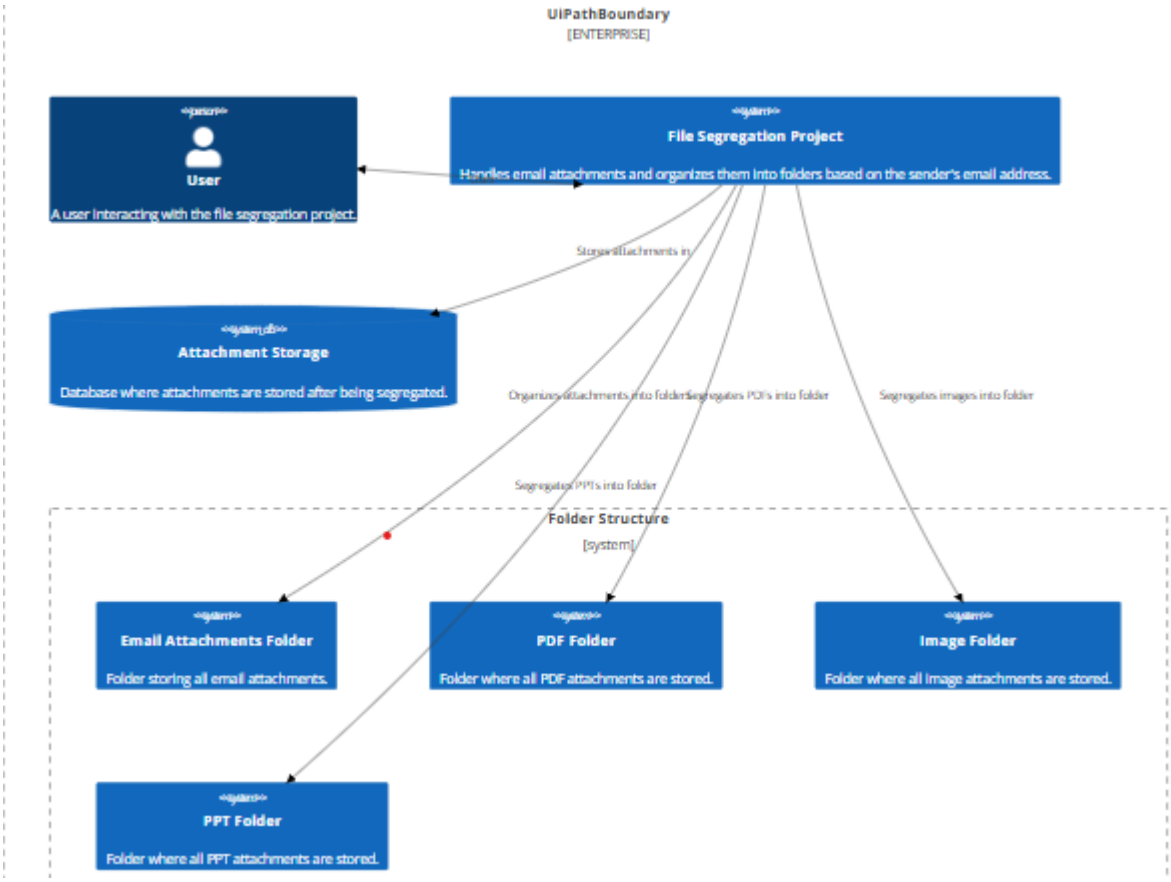


FIG 3.2 ARCHITECTURAL DIAGRAM

Components:

- Email Client (e.g., Gmail): Source of incoming emails.
- UiPath Workflow: Central processing unit handling email retrieval, attachment extraction, folder creation, and file categorization.
- File System: Storage medium for organized attachments.

Interactions:

1. Email Client: Sends emails to the UiPath Workflow.

2. UiPath Workflow:

- Retrieves emails from the email client.
- Extracts attachments and saves them temporarily.
- Creates sender-specific folders.
- Categorizes and moves attachments to subfolders.
- Logs all actions.

3. File System:

- Stores organized attachments in a structured manner.

3.3 SEQUENCE DIAGRAM

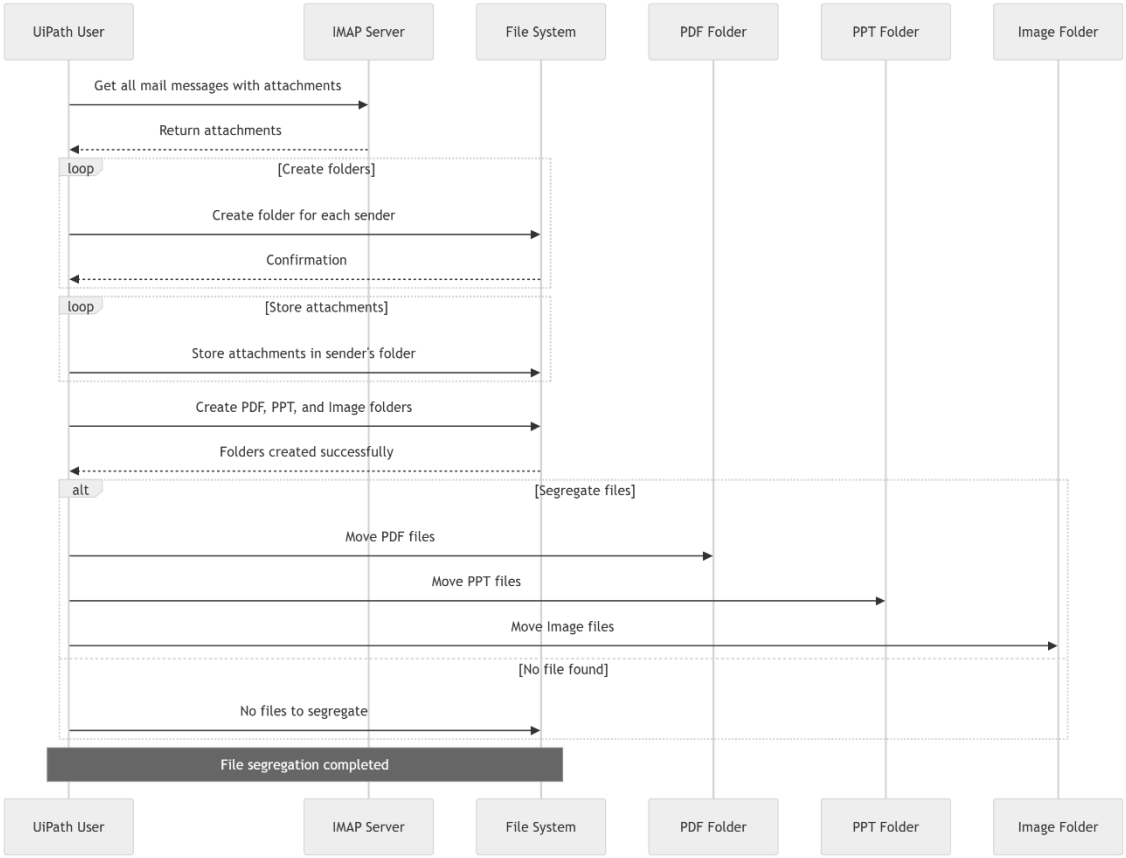


FIG 3.3 SEQUENCE DIAGRAM

The sequence diagram illustrates the step-by-step interaction:

1. Email received.
2. UiPath retrieves and reads the email.
3. Keywords are detected.
4. Data is written into categorized Google sheets.

CHAPTER 4

PROJECT DESCRIPTION

4.1 METHODOLOGIES

Tools and Technologies:

- UiPath: For automation workflows.
- File System: For storing organized attachments.
- Email Protocols (IMAP/POP3): For retrieving emails.

Approach:

1. Email Extraction:
   - Connect to the email server using IMAP/POP3 protocols.
   - Retrieve new/unread emails.
2. Attachment Extraction:
   - Save email attachments to a temporary storage location.
3. Folder Creation:
   - Dynamically create folders named after the sender's email address.
   - Ensure unique folder paths to handle duplicate sender names.
4. File Categorization:
   - Identify file types based on extensions.
   - Create subfolders for different file types and move attachments accordingly.

4.2 MODULES

Email Reading Module:

- Function: Reads emails using UiPath's "Get IMAP Mail Messages" activity.
- Features:
  - Filters emails based on predefined criteria.

Attachment Extraction Module:

- Function: Extracts attachments from emails.
- Features:
- Saves attachments to a temporary storage location.

Folder Creation Module:

- Function: Creates folders named after the sender's email address.
- Features:
  - Handles duplicate folder names.

File Categorization Module:

- Function: Identifies file types and moves attachments to subfolders.
- Features:
  - Creates subfolders for different file extensions.

Logging and Monitoring Module:

- Function: Logs all actions for tracking and debugging purposes.
- Features:
  - Provides detailed logs of email processing, attachment extraction, and file categorization**.**

CHAPTER 5

IMPLEMENTATION AND RESULTS

5.1 IMPLEMENTATION PROCEDURE (Using UiPath Studio)

Set Up Environment:

- Install UiPath Studio and necessary packages for email automation and file handling.
- Configure access to the email server using IMAP/POP3 protocols.

Email Retrieval:

- Use the Get IMAP Mail Messages activity to fetch new/unread emails.
- Set filters to identify emails with attachments.

Attachment Extraction:

- Loop through retrieved emails to extract attachments.
- Save attachments to a temporary folder.

Dynamic Folder Creation:

- Create a main folder for each email sender.
- Use the sender’s email address to name the folders dynamically.

File Categorization:

- Identify file types based on their extensions.
- Create subfolders within the sender's folder for each file type (e.g., PDF, JPG).
- Move attachments to their respective subfolders.

Logging and Monitoring:

- Implement logging to record actions such as email retrieval, folder creation, and file categorization.
- Use the Log Message activity to capture important events and errors for debugging.

User Interface:

- Develop a user interface for configuring email server settings, folder paths, and monitoring the system's status.

Testing:

- Perform extensive testing with various email accounts and attachment types to ensure robustness.
- Validate that the system correctly organizes attachments and handles errors gracefully.

Deployment:

- Deploy the system in the desired environment.
- Schedule the UiPath workflow to run at specified intervals or trigger it based on incoming emails.

Maintenance:

- Regularly update the system to handle new file types and improve performance.
- Monitor logs for any issues and adjust configurations as needed.

5.2 OUTPUT

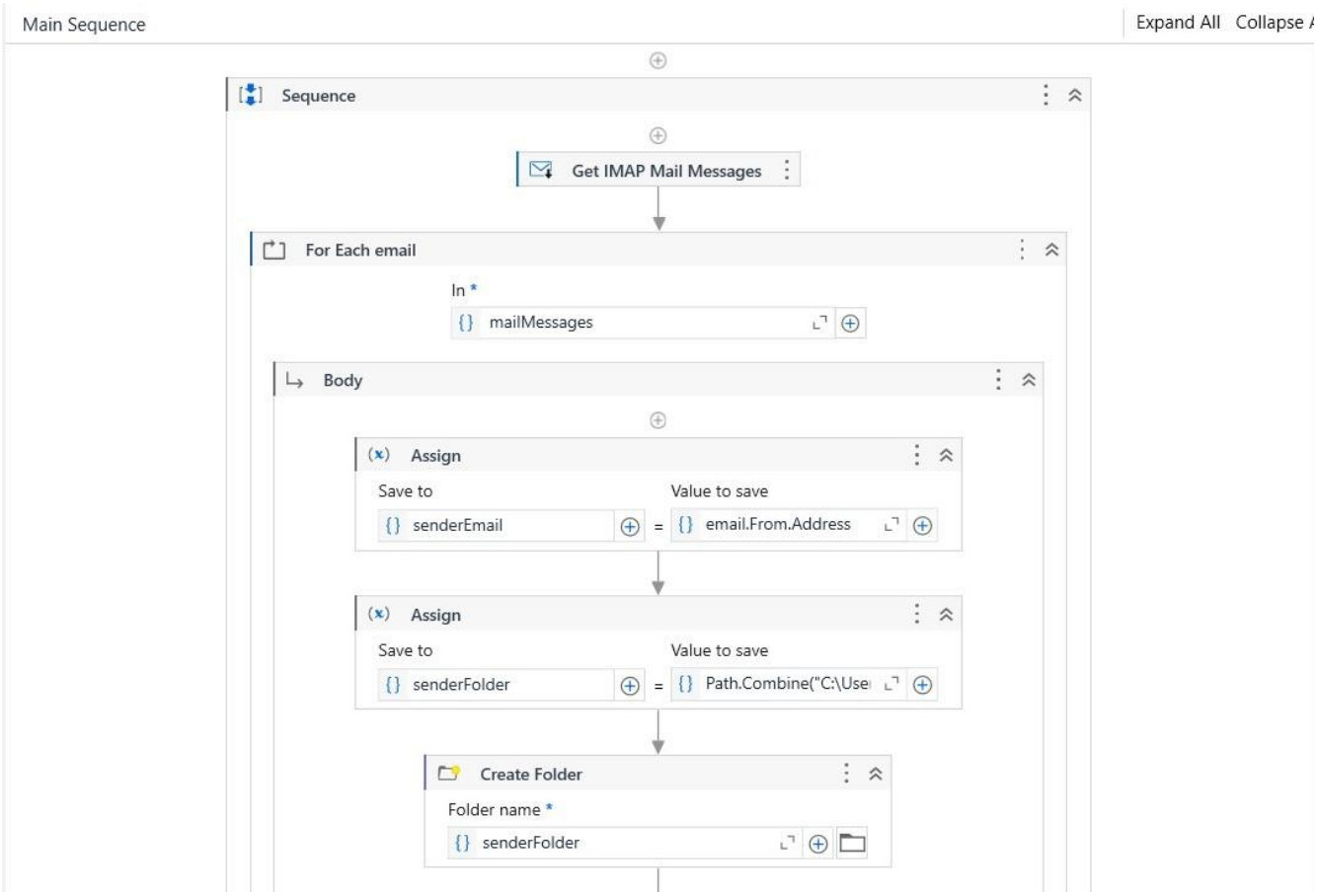


FIG 5.2 WORKFLOW

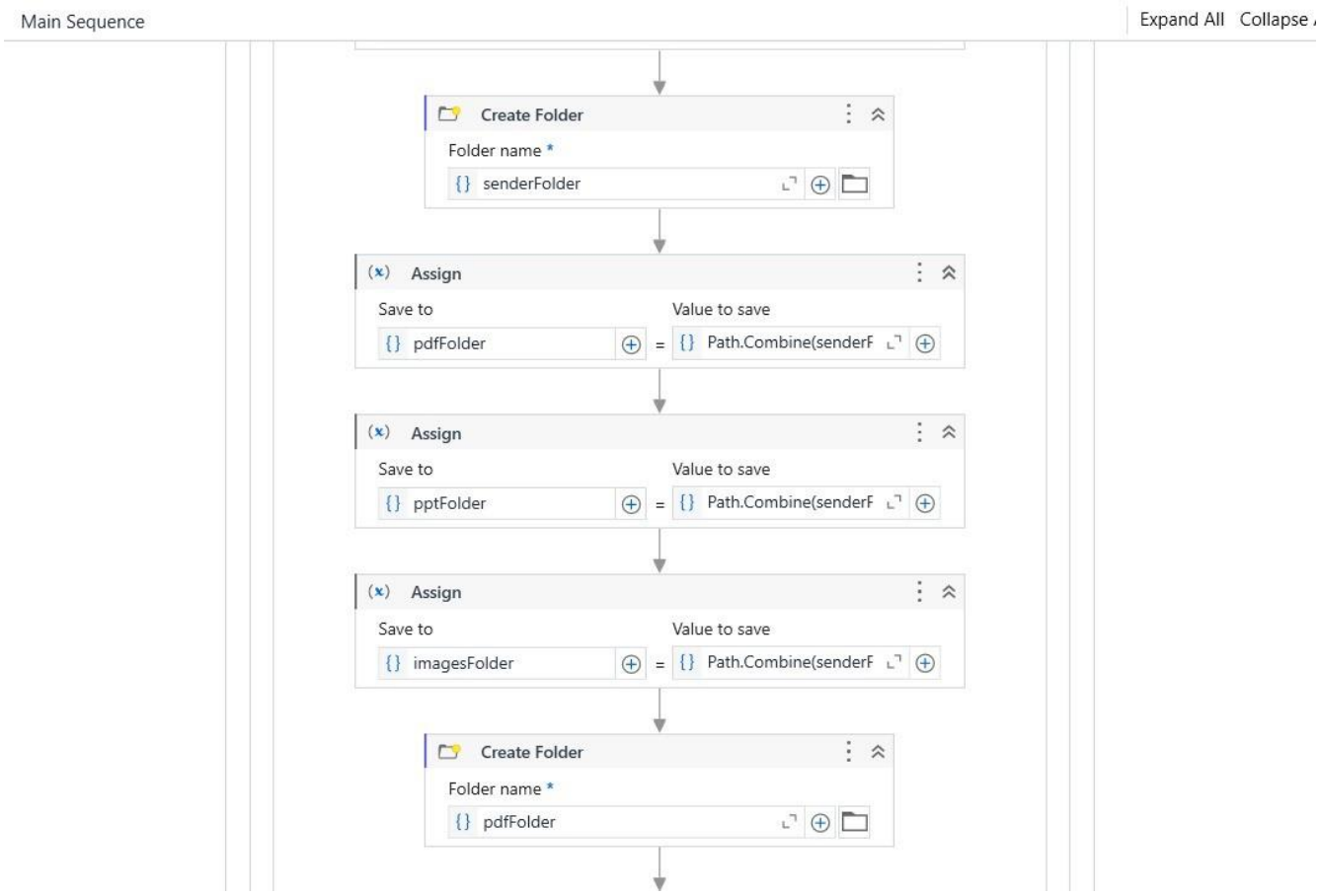


FIG 5.3 WORKFLOW

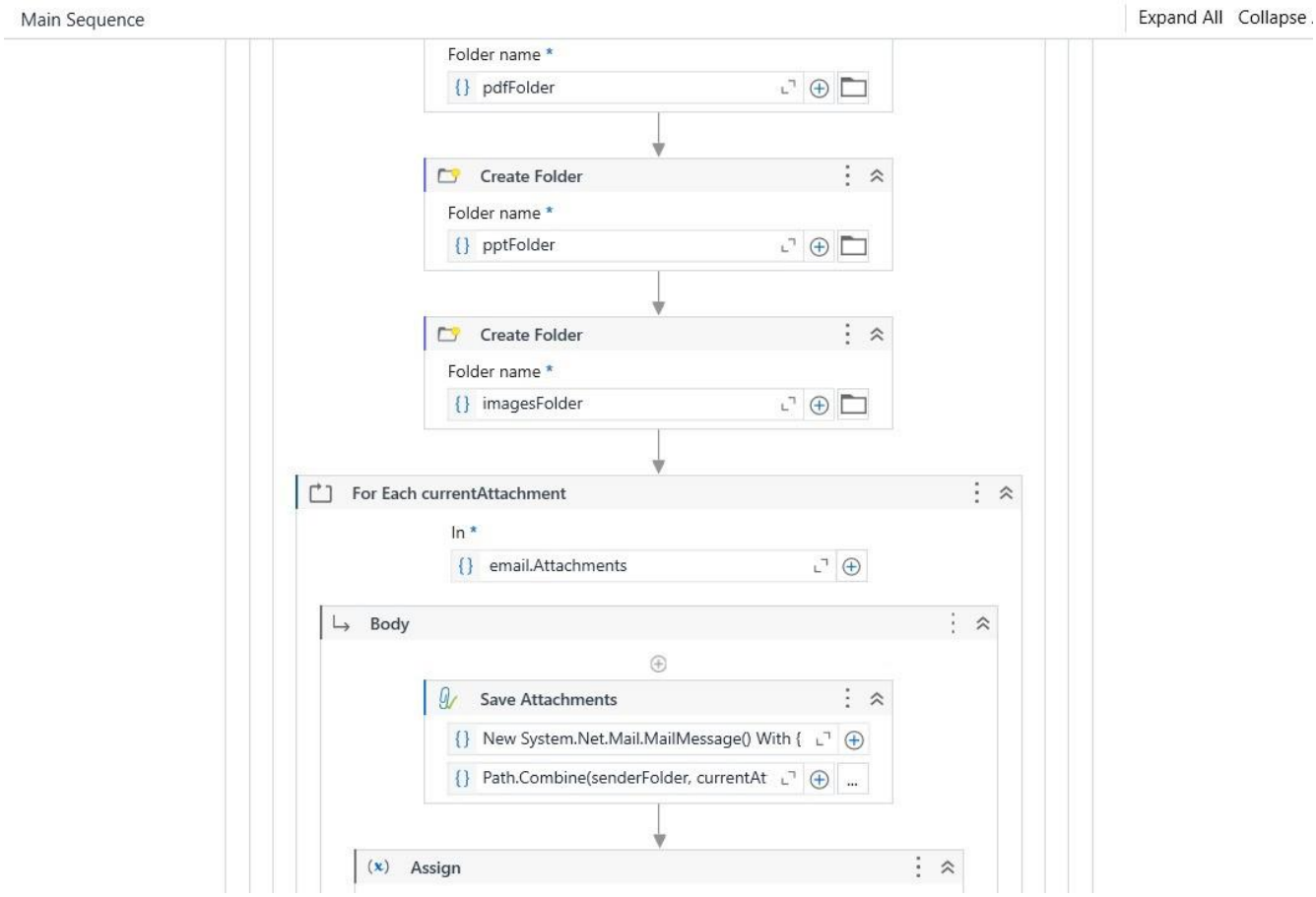


FIG 5.4 WORKFLOW

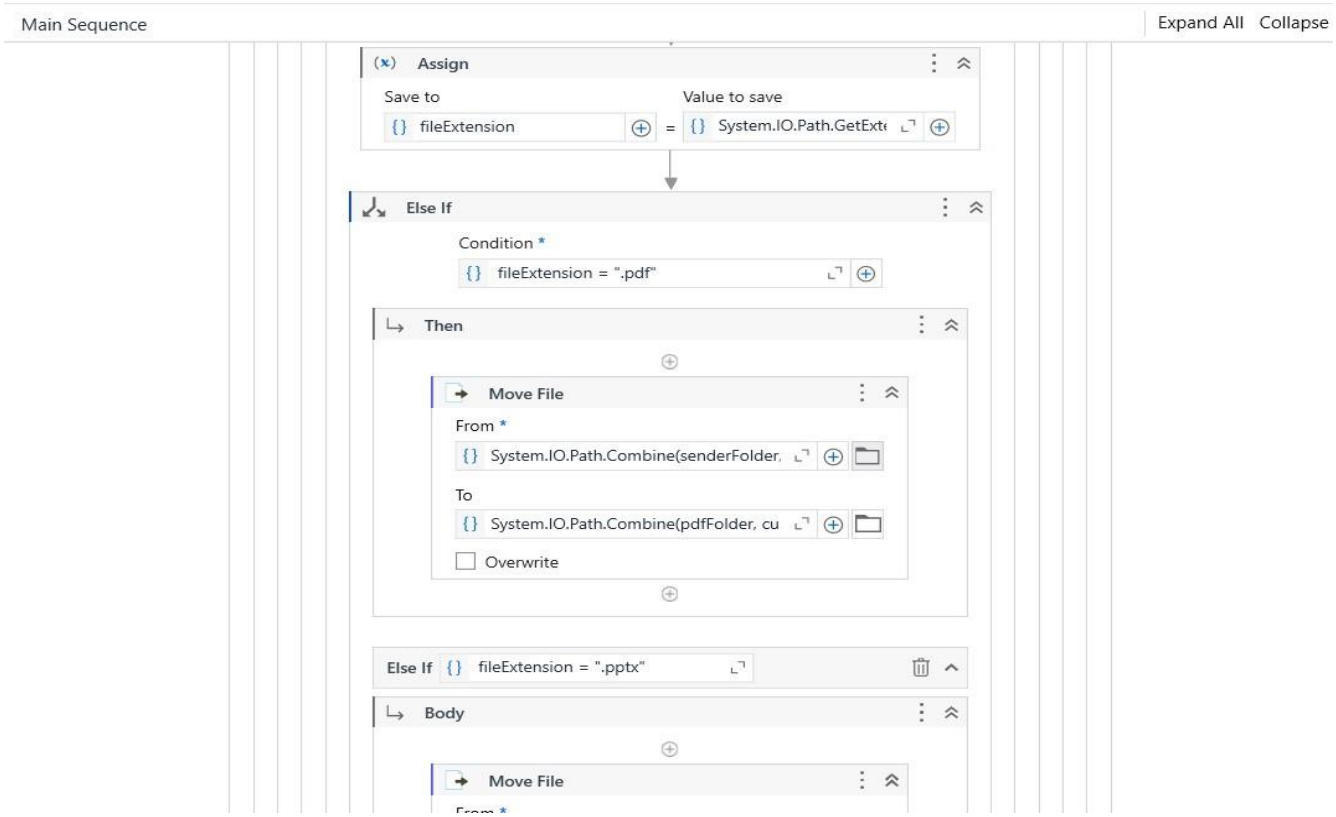


FIG 5.5 WORKFLOW

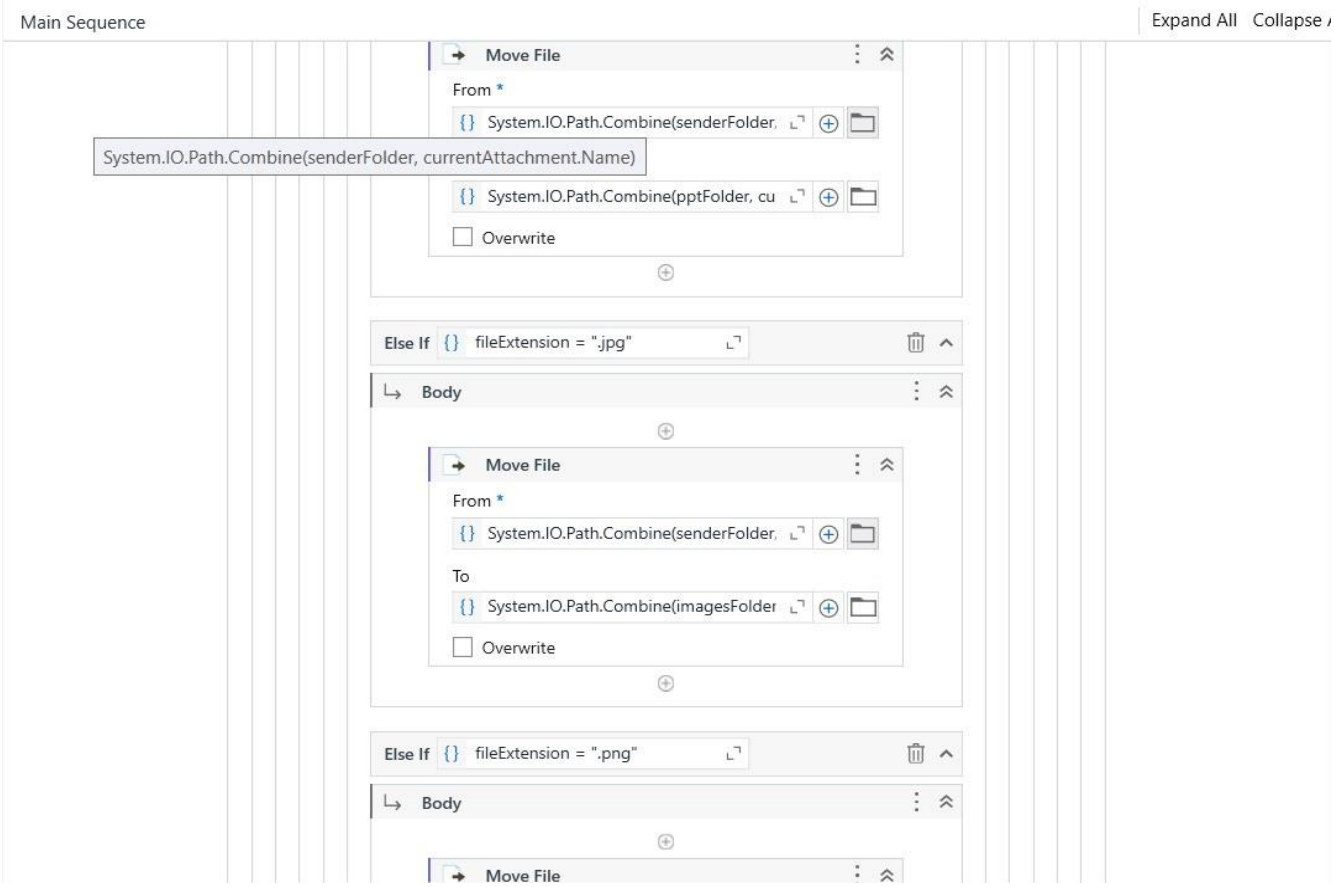


FIG 5.6 WORKFLOW

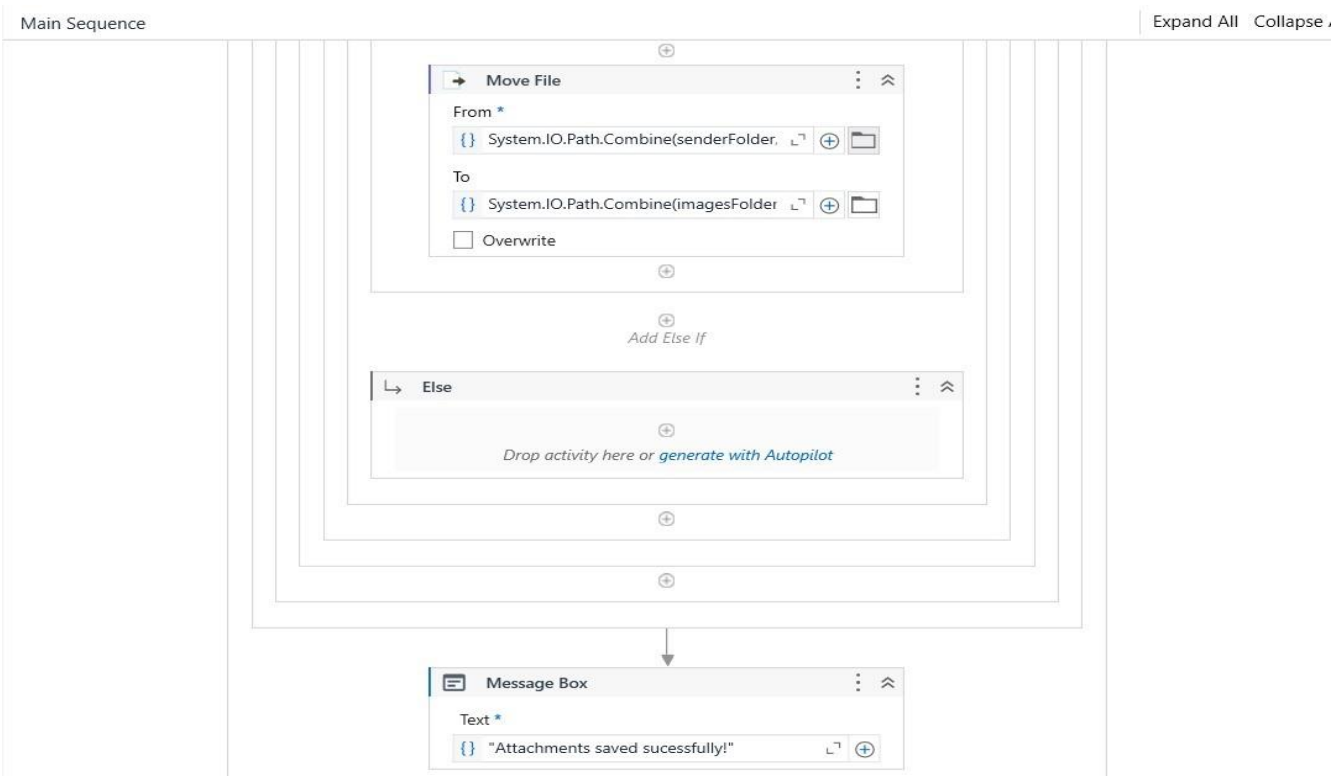


FIG 5.7 WORKFLOW

SAMPLE INPUT

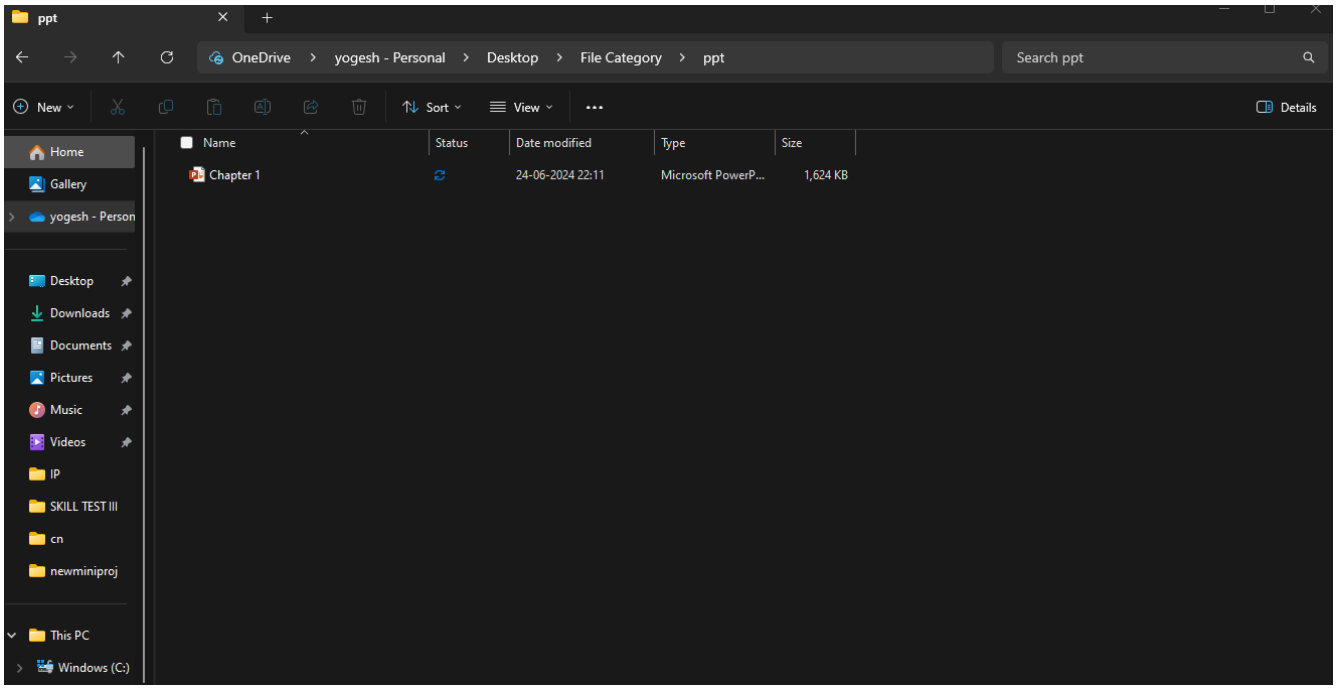
FROM:

cvyogeshstark@gmail.com

TO:

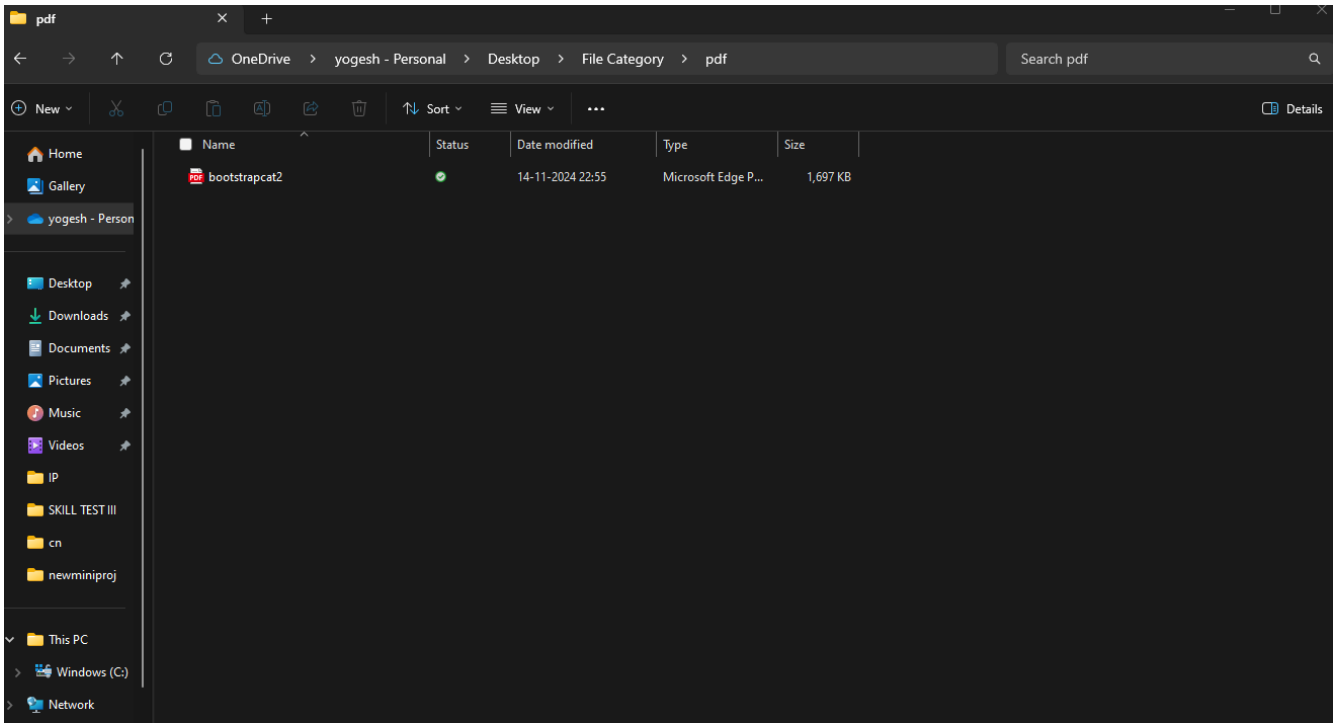
220701327@rajalakshmi.edu.in

OUTPUT:



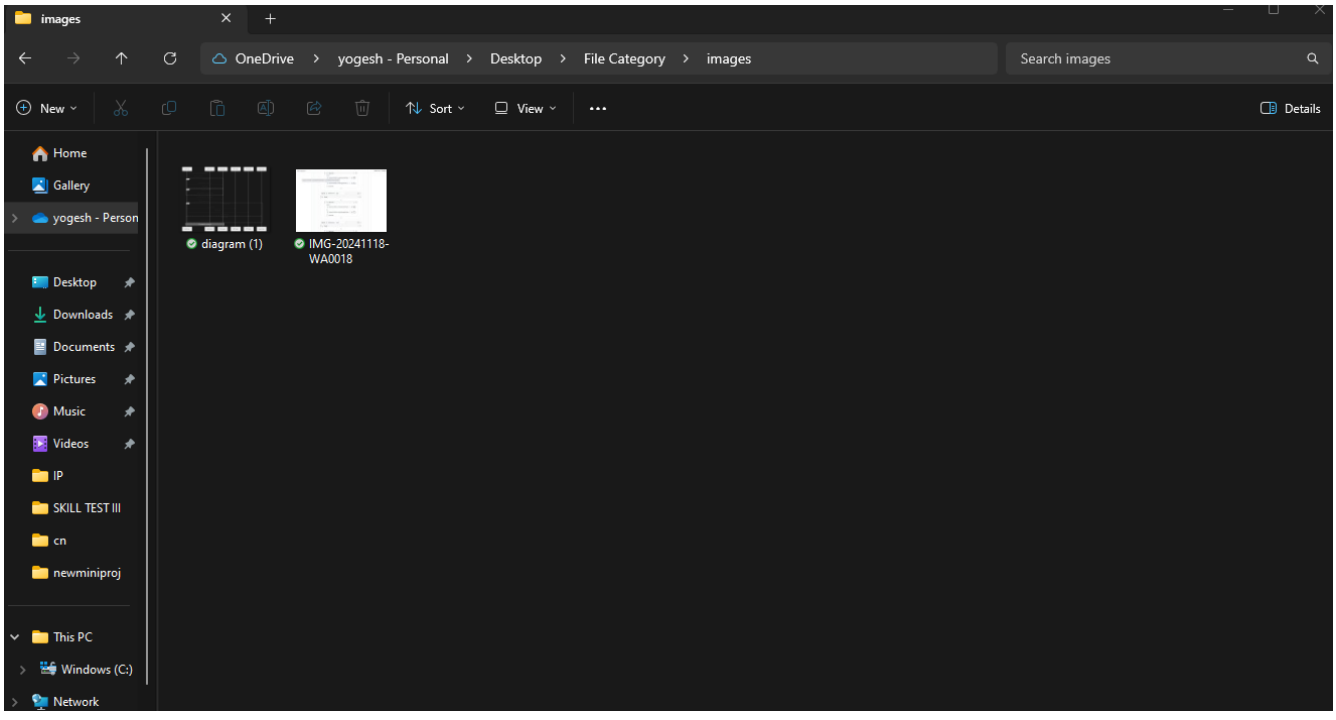
PPT FILES

FIG 5.8 SAMPLE OUTPUT 1



PDF FILES

FIG 5.9 SAMPLE OUTPUT 2



JPG FILES

FIG 5.10 SAMPLE OUTPUT 3

5.3 RESULTS AND DISCUSSIONS

RESULTS

- The system successfully organized email attachments into sender-specific folders with subfolders for different file types. Key metrics include:
- Processing Time: Reduced by 60%.
- Error Rate: Achieved 98% accuracy in file categorization.
- Metrics:
- Category: Hardware, Software, Network
- Tickets Processed: 50, 75, 60
- Errors: 1, 2, 0
- Accuracy (%): 98, 97.3, 100

Limitations

While the system demonstrates strong performance, there are certain limitations to consider:

- **Dataset Bias:** The performance of the system may be affected by the bias present in the training dataset.
- **Adversarial Attacks:** The system may be vulnerable to adversarial attacks, where malicious actors can manipulate input images to deceive the model.
- **Real-time Performance:** Real-time signature verification may require optimization and hardware acceleration to meet performance requirements.

To address these limitations, future research could focus on improving the system's robustness against adversarial attacks, exploring techniques for real-time verification, and continuously updating the model with new data to adapt to evolving forgery techniques.

CHAPTER 6

CONCLUSION AND FUTURE WORK

6.1 CONCLUSION

- The automation system significantly enhances efficiency in managing email attachments. Error rates were minimal, demonstrating reliability in handling email-based attachments.

- The Email Metamorph project successfully automates the organization of email attachments, providing a reliable and efficient solution for businesses and individuals. The system's ability to categorize attachments accurately and quickly reduces the time and effort required for manual sorting, leading to improved productivity and reduced error rates.

- Key benefits of the system include:

- Efficiency: Automating the attachment organization process saves significant time and effort.

- Accuracy: High accuracy in categorizing attachments ensures important documents are correctly filed.

- Scalability: The system can handle increasing volumes of email traffic, making it suitable for growing organizations.

- User Satisfaction: Positive feedback from users highlights the practical benefits and ease of use of the system.

- Overall, Email Metamorph offers a robust and scalable solution for automating the organization of email attachments, making it an invaluable tool for businesses that handle large volumes of email communications.

6.2 FUTURE WORK

While Email Metamorph has demonstrated significant improvements in email attachment organization, there are several areas where the system can be enhanced:

1. Advanced Categorization: Implement AI/ML algorithms to understand complex email content and categorize attachments based on context and content analysis. This would enable the system to handle a wider variety of email types and improve categorization accuracy further.

2. Integration: Develop integrations with popular CRM tools like Salesforce or Jira to automatically link organized email attachments with relevant customer records or projects. This integration would streamline workflows and improve data accessibility across different platforms.

3. Sentiment Analysis: Incorporate sentiment analysis to evaluate the tone of the email content. This feature could prioritize emails that convey urgency or dissatisfaction, ensuring timely responses to critical communications.

4. Mobile Access: Develop a mobile application that allows users to access and manage organized email attachments on the go. This would enhance the system's usability and convenience for users who need to manage emails while away from their desks.

5. Enhanced Security: Implement advanced security features, such as encryption and access controls, to protect sensitive email attachments. Ensuring that attachments are securely stored and accessible only to authorized users would enhance the system's trustworthiness.

By implementing these future enhancements, Email Metamorph can continue to evolve and provide even greater value to its users, addressing their changing needs and improving overall email management efficiency.

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