FLOWCHART GENERATOR BOT

A MINI-PROJECT REPORT

Submitted by

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BONAFIDE CERTIFICATE

Certified that this project report **"FlowChart Generator Bot"** is the bonafide work of **"BHUVANESHWARI M (220701046)"** who carried out the project work for the subject OAI1903 - Introduction to Robotic Process Automation under my supervision.

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Bhuvaneshwari M (220701046).

ABSTRACT

The "Flowchart Generator Bot" is a cutting-edge Robotic Process Automation (RPA) solution developed using UiPath to automate and simplify the creation of flowcharts. Designed for efficiency and adaptability, this intelligent bot enables users to generate detailed and accurate flowcharts by dynamically transforming process details and activity steps into visual diagrams. Users provide input variables such as process names and step descriptions through a user-friendly interface. The bot processes this data, generating UML-compatible code and visualizing it into structured flowchart diagrams.

By seamlessly integrating with external rendering tools, the bot ensures the generation of clear and professionally styled flowcharts, ready for immediate use in documentation, presentations, or process analysis. The resulting diagrams are systematically saved, providing users with an easily accessible and organized output. This automation reduces manual effort, eliminates errors, and significantly accelerates the flowchart creation process. The "Flowchart Generator Bot" offers a robust solution to streamline documentation workflows, fostering precision and productivity in professional and academic environments.

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LIST OF ABBREVIATIONS

ABBREVIATION	ACRONYM
RPA	Robotic Process Automation
AI	Artificial Intelligence
UML	Unified Modeling Language
NLP	Natural Language Processing
PNG	Portable Network Graphics
PDF	Portable Document Format

CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

The "Flowchart Generator Bot" is an innovative application of Robotic Process Automation (RPA), designed to revolutionize the process of creating flowcharts by integrating UiPath automation with the capabilities of ChatGPT. This project addresses the challenges of manual flowchart creation by leveraging advanced AI-driven conversation tools and automated diagram generation platforms to streamline the entire workflow.

In a world where process visualization is critical for documentation, decision-making, and communication, this bot offers an efficient solution for generating precise flowcharts dynamically. Users provide structured inputs, such as process names, activity descriptions, and step sequences, through a simple interface. The bot interacts with ChatGPT to generate accurate PlantUML-compatible code, which is then seamlessly integrated with flowchart rendering platforms like Diagram.net or other visualization tools to produce high-quality flowchart diagrams.

Built on the UiPath Automation Platform, the bot combines the low-code visual development environment of UiPath Studio with intelligent automation capabilities. UiPath Robots execute the entire process, ensuring consistency, speed, and error-free output. Furthermore, ChatGPT’s natural language understanding enriches the bot’s capability to interpret user input and produce comprehensive PlantUML code, making flowchart generation intuitive even for users with minimal technical expertise.

By automating this traditionally time-consuming task, the "Flowchart Generator Bot" not only saves significant manual effort but also ensures the generation of accurate and well-structured flowcharts. This integration of ChatGPT's conversational AI and UiPath's RPA expertise represents a pioneering step in harnessing advanced technologies to enhance productivity and improve workflows across professional and academic domains.

1.2 OBJECTIVE

The primary objective of the "Flowchart Generator Bot" is to streamline and automate the creation of flowcharts, transforming process details into clear, professional diagrams with minimal user effort. By integrating Robotic Process Automation (RPA) with conversational AI tools like ChatGPT, the bot aims to dynamically generate UML-compatible code from user inputs and utilize diagram generator platforms to produce high-quality flowcharts. This project seeks to offer users—ranging from professionals to students—a fast, accurate, and intuitive solution for visualizing processes, thereby enhancing productivity, reducing manual errors, and simplifying workflows in documentation and analysis.

1.3 EXISTING SYSTEM

In the current landscape of process documentation, creating flowcharts is often a manual and tedious task. Users must carefully design diagrams by inputting process steps into flowcharting tools, which can be time-consuming and prone to errors. The process requires a thorough understanding of flowcharting conventions and the use of specialized software, which can pose challenges for individuals with limited technical expertise.

Moreover, translating textual descriptions of processes into accurate visual representations demands significant effort, often leading to inconsistencies in the final output. The lack of an automated and efficient system for generating flowcharts hinders productivity and delays the documentation of workflows. This underscores the need for an intelligent, automated solution to simplify and streamline the flowchart creation process.

1.4 PROPOSED SYSTEM

The "Flowchart Generator Bot" is envisioned as a revolutionary solution to address the inefficiencies of manual flowchart creation. By leveraging UiPath's RPA capabilities and integrating with AI tools like ChatGPT, the bot automates the transformation of process details into visually accurate flowcharts. The proposed system simplifies the creation process by dynamically generating UML-compatible code from user inputs and utilizing diagram generation platforms to render professional-quality diagrams.

This solution aims to minimize the manual effort required for flowchart design while ensuring consistency, accuracy, and speed. Users can easily input process descriptions, and the bot will generate clear, structured flowcharts tailored to their requirements. The bot's capabilities also include organizing and saving flowcharts systematically for quick access and reuse. Through this project, we aim to redefine process visualization by making flowchart creation intuitive, efficient, and accessible, empowering users to focus on core tasks while technology handles the intricacies of diagram generation.

CHAPTER 2

LITERATURE REVIEW

2.1 Survey on Robotic Process Automation (RPA) in Process Documentation:

Robotic Process Automation (RPA) has been increasingly adopted to streamline workflows and automate repetitive tasks across various domains, including process documentation. Traditional methods of documenting workflows and creating flowcharts are often time-intensive and prone to human error. RPA offers a transformative approach to automate these tasks, enhancing both efficiency and accuracy. The literature review of research papers related to RPA in process documentation is listed below:

[1] A research study explores the role of RPA in automating business process management tasks, such as data visualization and workflow documentation. It highlights how RPA can reduce manual intervention and ensure consistency in output, proving especially useful in industries that rely heavily on process visualization.

[2] A study in the Journal of Process Automation and Workflow Management demonstrates the potential of RPA in automating the creation of flowcharts from textual descriptions of processes. The paper emphasizes the importance of integrating RPA with AI technologies to achieve higher accuracy and adaptability in generating visual representations of workflows.

2.2 Survey on AI- Assisted Diagram Generation:

AI-assisted tools for diagram generation are evolving rapidly, enabling users to transform textual data into visual formats. By leveraging AI algorithms, these tools help in reducing the cognitive load and time required for designing diagrams. However, challenges such as interpreting ambiguous input and ensuring the accuracy of the generated diagrams remain. The literature review of research papers related to AI-assisted diagram generation is listed below:

[1] A paper from the International Journal of AI and Visualization explores the integration of natural language processing (NLP) with diagram generation tools. The study concludes that NLP-powered systems can accurately interpret user inputs to create UML diagrams, making them suitable for technical and academic purposes.

[2] Research from the University of Edinburgh evaluates the efficiency of AI-based tools in generating sequence diagrams and flowcharts. The study highlights how AI models trained on large datasets can understand complex relationships between process steps, resulting in accurate and meaningful diagrams.

2.3 Survey on PlantUML and Visualization Platforms:

PlantUML has emerged as a widely used tool for creating UML diagrams and other visual representations of processes. Combined with visualization platforms like Diagram.net, these tools simplify diagram generation by enabling users to describe processes in a textual format. However, the manual effort required to create PlantUML code often limits its accessibility for non-technical users. The literature review of research papers related to PlantUML and visualization platforms is listed below:

[1] A study published in the Journal of Software Engineering discusses the role of PlantUML in generating standardized UML diagrams. The research emphasizes the flexibility and scalability of PlantUML, particularly when integrated with automated systems.

[2] A survey from Carnegie Mellon University investigates the usability of diagram visualization platforms, focusing on their ability to render PlantUML code into professional-quality diagrams. The study suggests that integrating these platforms with automation tools can significantly enhance user experience and productivity.

2.4 Summary of the Intersection of RPA, AI-Assisted Generation, and Diagram Visualization:

The "Flowchart Generator Bot" bridges these domains by leveraging RPA to automate the process of generating flowcharts. By integrating ChatGPT for NLP-based input interpretation and using UML for code generation, the bot addresses the inefficiencies of manual diagram creation. Additionally, it utilizes visualization platforms to render diagrams, ensuring professional-quality outputs.

This project's innovative approach aligns with the current advancements in RPA, AI, and visualization tools, offering a timely solution to the challenges of process documentation. The integration of these technologies positions the "Flowchart Generator Bot" as a significant contribution to automating workflow visualization, making it accessible, efficient, and reliable for users across diverse domains.

CHAPTER 3

SYSTEM DESIGN

3.1 SYSTEM FLOW DIAGRAM

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

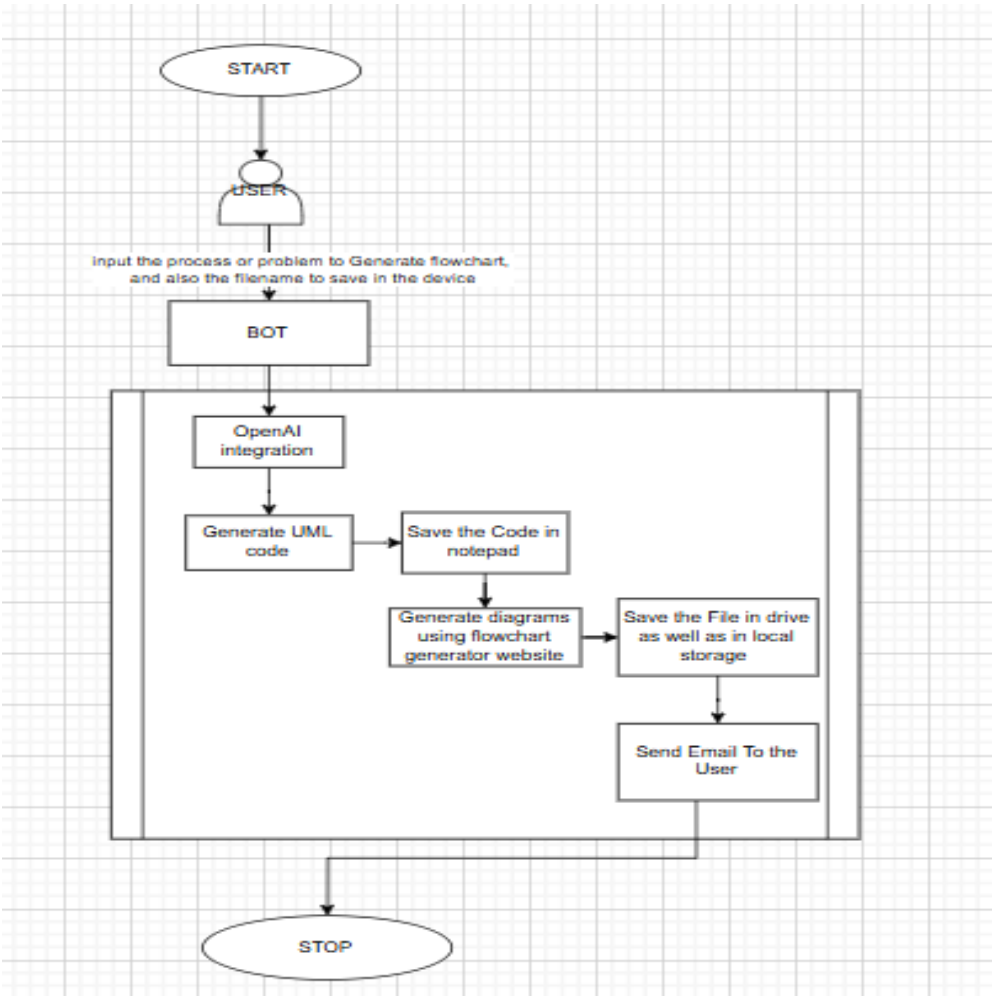


Fig 3.1 System Flow Diagram.

3.2 ARCHITECTURE DIAGRAM

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

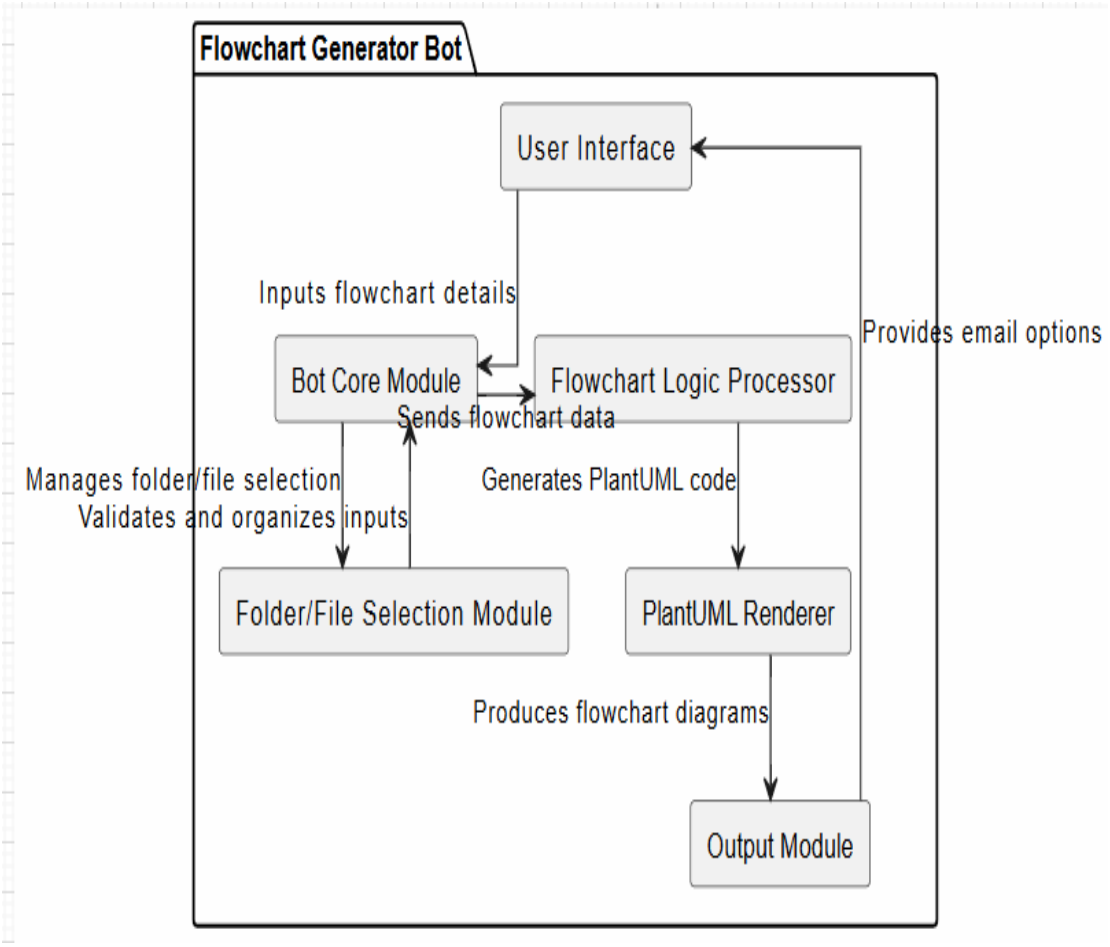


Fig 3.2 Architecture Diagram

3.3 SEQUENCE DIAGRAM

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

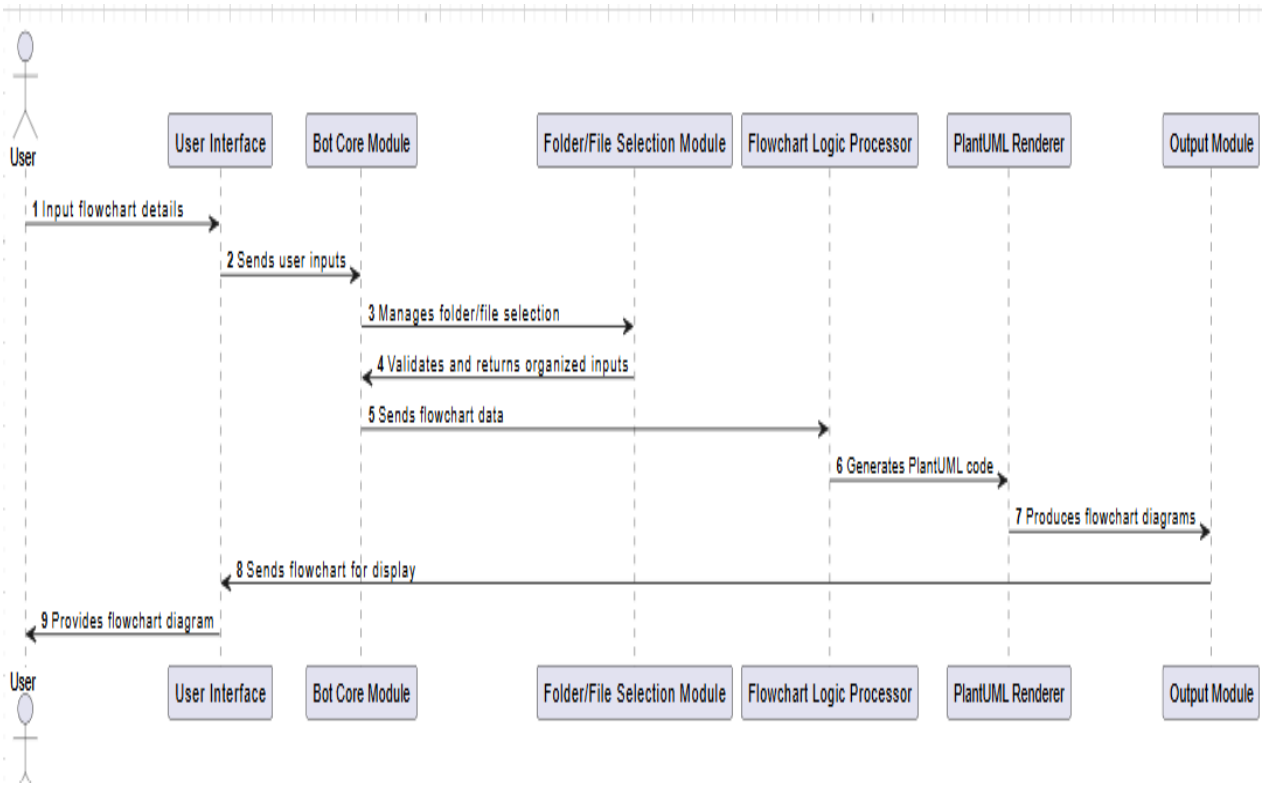


Fig 3.3 Sequence Diagram

CHAPTER 4

PROJECT DESCRIPTION

The "Flowchart Generator Bot" is an advanced Robotic Process Automation (RPA) project designed to simplify and automate the creation of flowcharts from user-defined process details. Developed using UiPath, this intelligent bot integrates with ChatGPT to dynamically generate UML code from natural language inputs and utilizes diagram generation platforms to render professional-quality flowcharts. By automating the traditionally manual and time-intensive task of flowchart creation, the bot provides users with an efficient, accurate, and user-friendly tool for process visualization, enhancing productivity and ensuring consistent, error-free outputs.

4.1. MODULES:

4.1.1. INPUT HANDLING AND INITIALIZATION:

4.1.1.1. User input for Process Details:

- Accept process descriptions or details from the user via a conversational interface (e.g., ChatGPT).

4.1.1.2. Code Generation:

- Parse the user input to dynamically generate UML-compatible code for the specified process flow.

4.1.1.3. Diagram Initialization:

- Configure integration with diagram generation platforms like PlantUML or Diagram.net for seamless flowchart creation.

4.1.2 AUTOMATED FLOWCHART CREATION:

4.1.2.1. Data Interpretation:

•Use AI-based NLP models to structure user-provided input into actionable flowchart elements such as start/end points, actions, and decisions.

4.1.2.2. Diagram Rendering:

- Render the generated PlantUML code into a flowchart using diagram generation platforms.

4.1.3 RESULT MANAGEMENT:

4.1.3.1 Diagram Storage:

- Save the generated flowcharts in a designated folder in preferred formats like PNG or PDF for user access.

4.1.3.2 Real-time Update:

- Display updates on the status of the flowchart generation process directly in the bot interface.
- Provide a preview of the completed flowchart for user verification and approval.

4.1.4 COMPLETION AND REPORTING:

4.1.4.1 Completion Message:

- Conclude the operation with a message indicating the successful completion of the integrity verification task.

CHAPTER 5

OUTPUT SCREENSHOTS

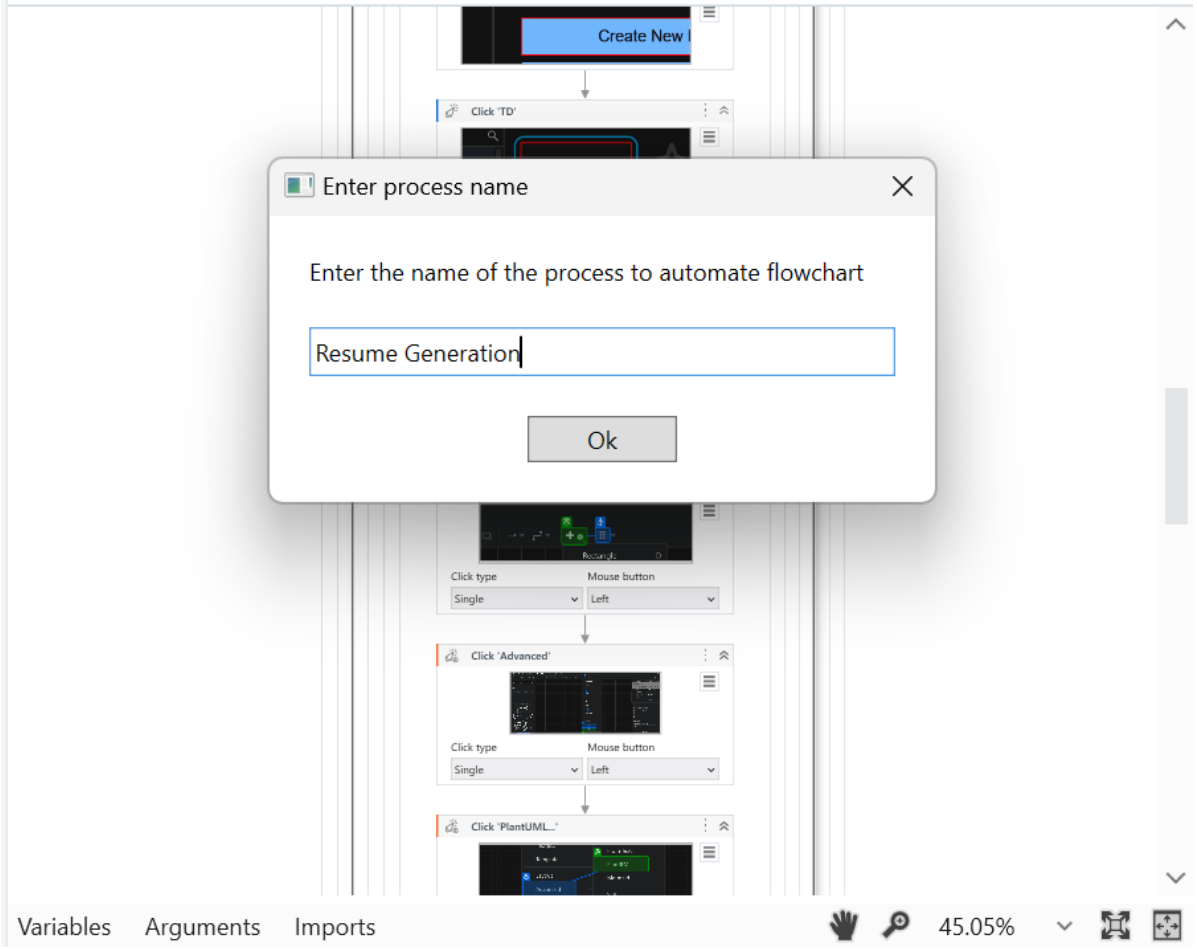


Fig 5.1 – Input Dialog

The bot gets input for process name or problem to generate flowchart shown in Fig 5.1.

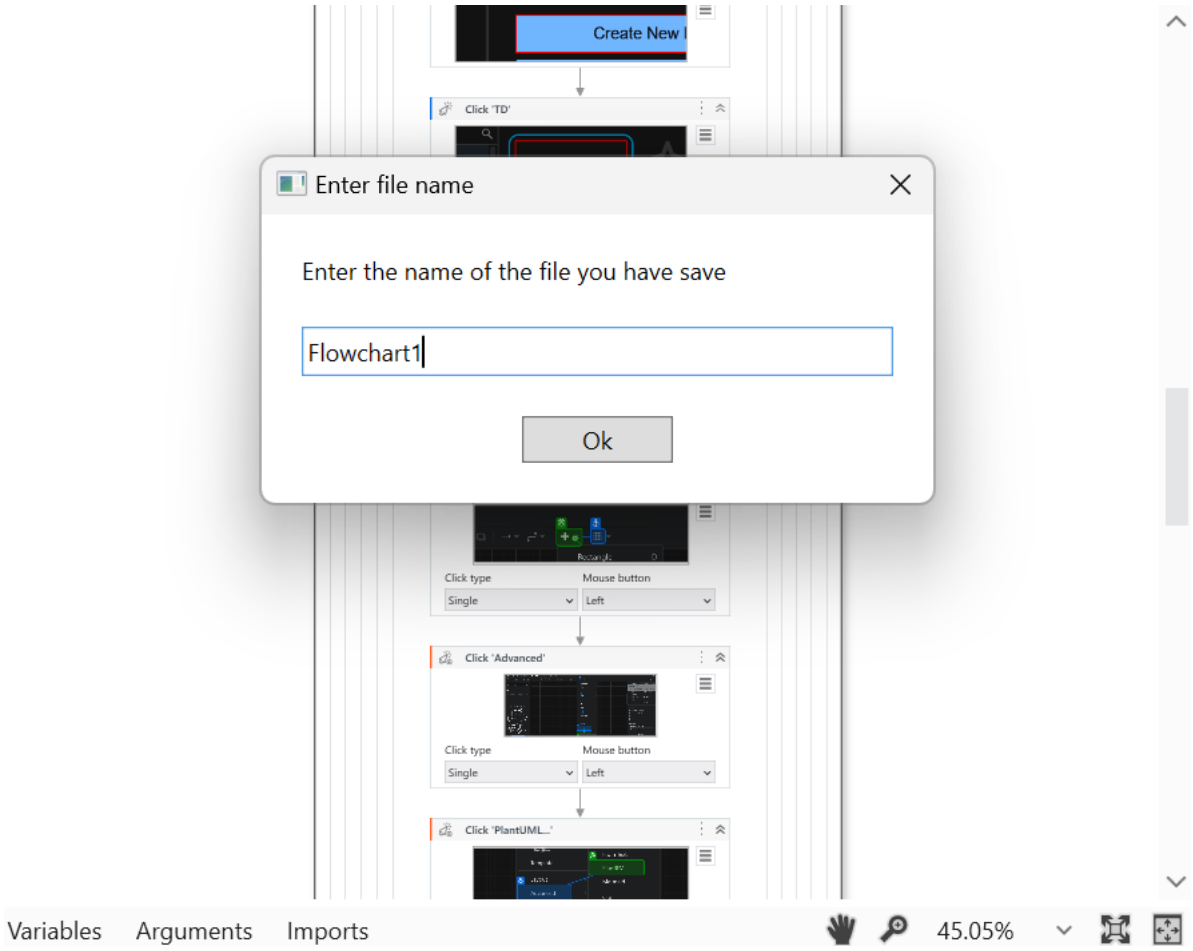


Fig 5.2 – Input Dialog

The bot gets the file name to save on local disk in Fig 5.2.

```
@startuml
start

:Receive user inputs for
basic details, education, skills, and experience;

if (Is all mandatory data provided?) then (yes)
  :Generate a draft resume;
  if (User wants to customize layout?) then (yes)
    :Provide customization options
    (e.g., color, format, sections);
    :Apply selected customizations;
  else (no)
    :Use default layout;
  endif
  :Preview the generated resume;
  if (Is user satisfied?) then (yes)
    :Save the resume as a PDF;
    :Send the resume to the user via email;
  elseif (Wants to edit details?) then (yes)
    :Allow user to edit details;
    :Regenerate the resume;
    :Repeat preview and save steps;
  else (no)
    :End without saving;
  endif
else (no)
  :Show error message "Mandatory details missing";
  :Request user to fill in the missing details;
  :Restart the process;
endif

stop
@enduml
```

Ln 34, Col 8 | 856 characters

Fig 5.3 – Writing PlantUML code in Notepad

The bot writes the UML code to the notepad in Fig 5.3.

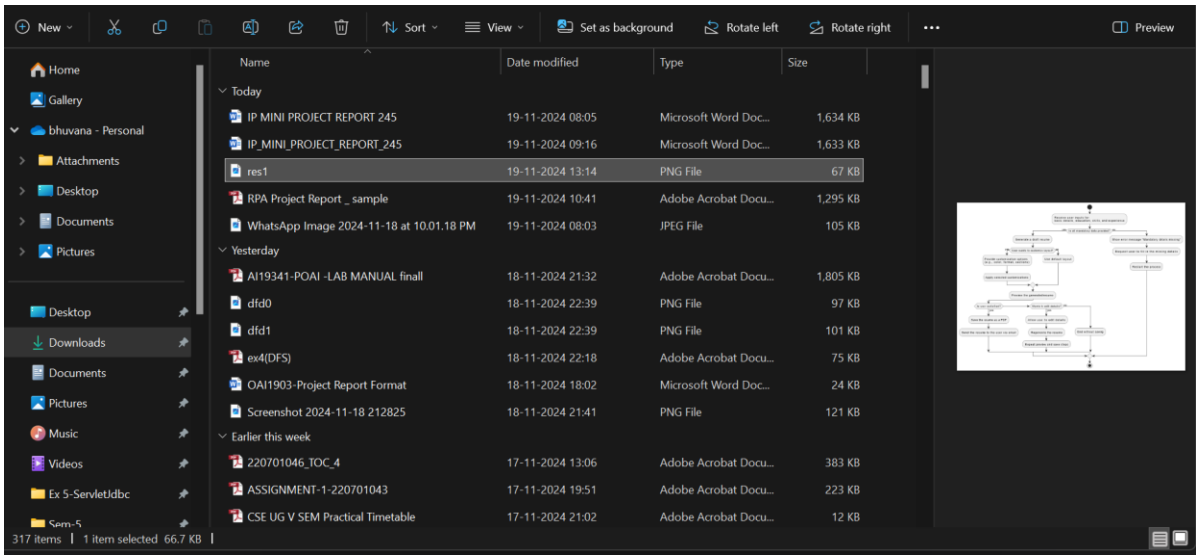


Fig 5.4 – Saved file.

This figure shows that the file is saved in the folder selected as shown in fig 5.4.

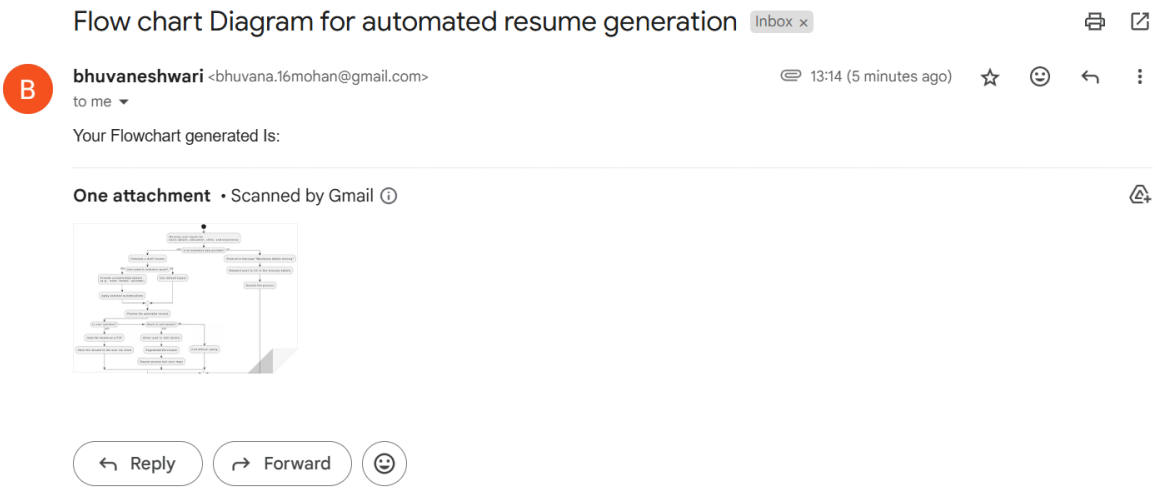


Fig 5.5 – Email to the user.

Automating the process of sending Email to the user for easy access and customised email for reminding what process has been executed as shown in Fig.5.5.

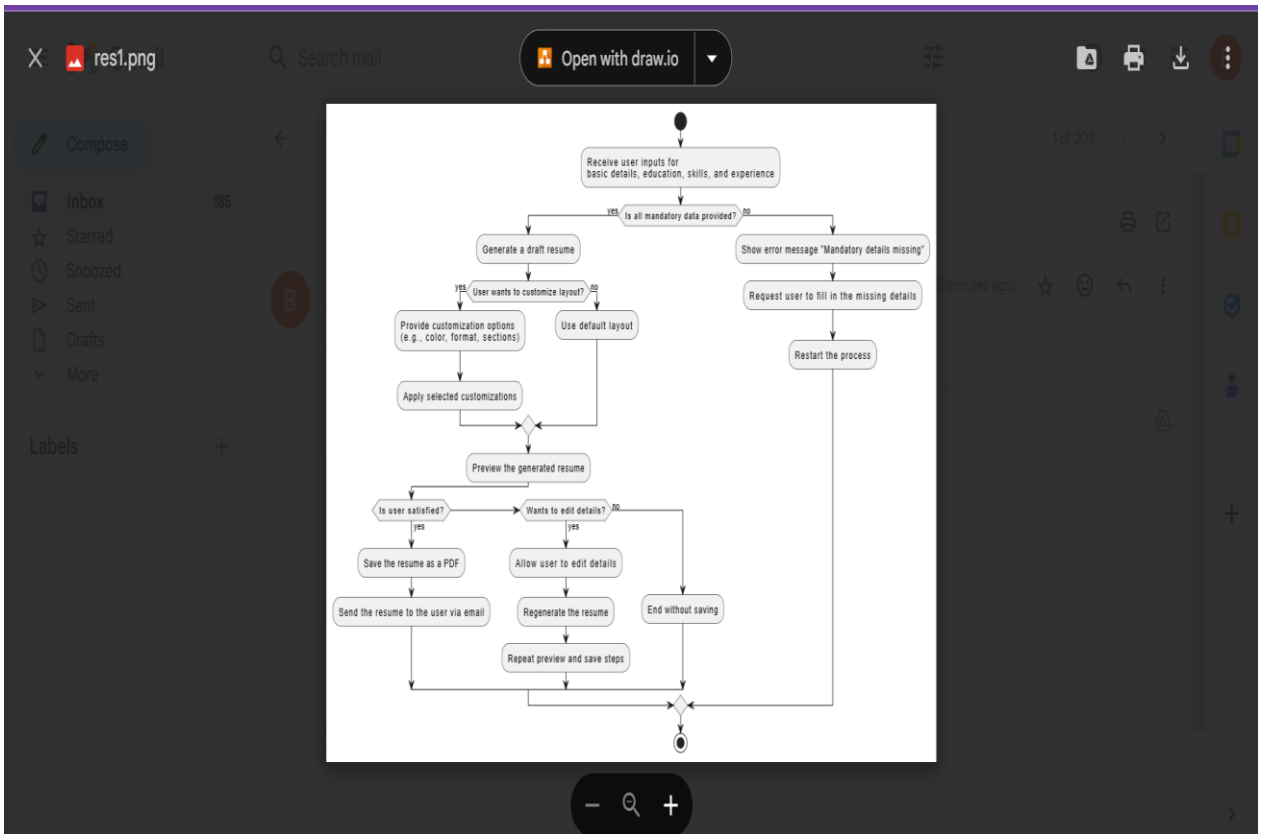


Fig 5.6 – Generated Flowchart

The Flowchart can be accessed from local storage as well as from the email through which the correct flowchart with decision process and looping process is generated following standards to draw a flowchart as shown in Fig.5.6.

CHAPTER 6

CONCLUSION

The "Flowchart Generator Bot" offers a transformative approach to automating the creation of flowcharts, leveraging UiPath's Robotic Process Automation (RPA) capabilities in conjunction with advanced AI tools like ChatGPT. By streamlining the traditionally manual and time-intensive process of designing flowcharts, the bot ensures efficiency, accuracy, and user-friendliness.

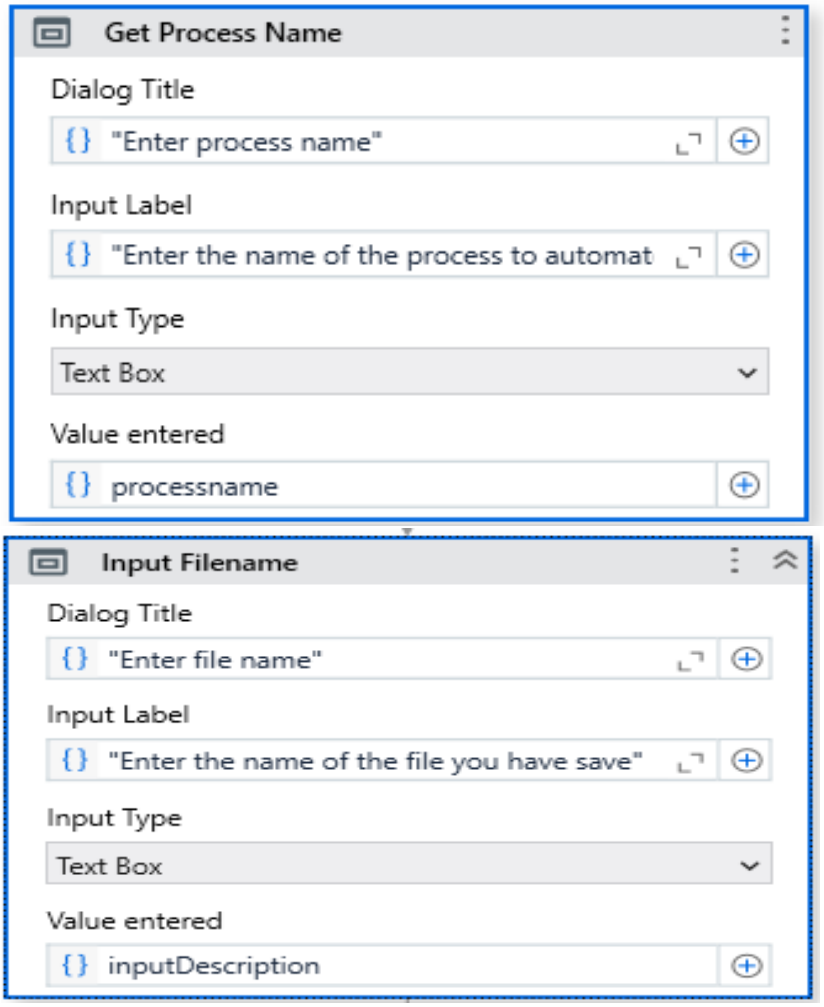
The bot's ability to dynamically interpret user inputs, generate PlantUML code, and render professional-quality diagrams provides a practical and robust solution for process visualization across various domains. Real-time updates enhance user interaction, while automated saving and organization simplify workflow management.

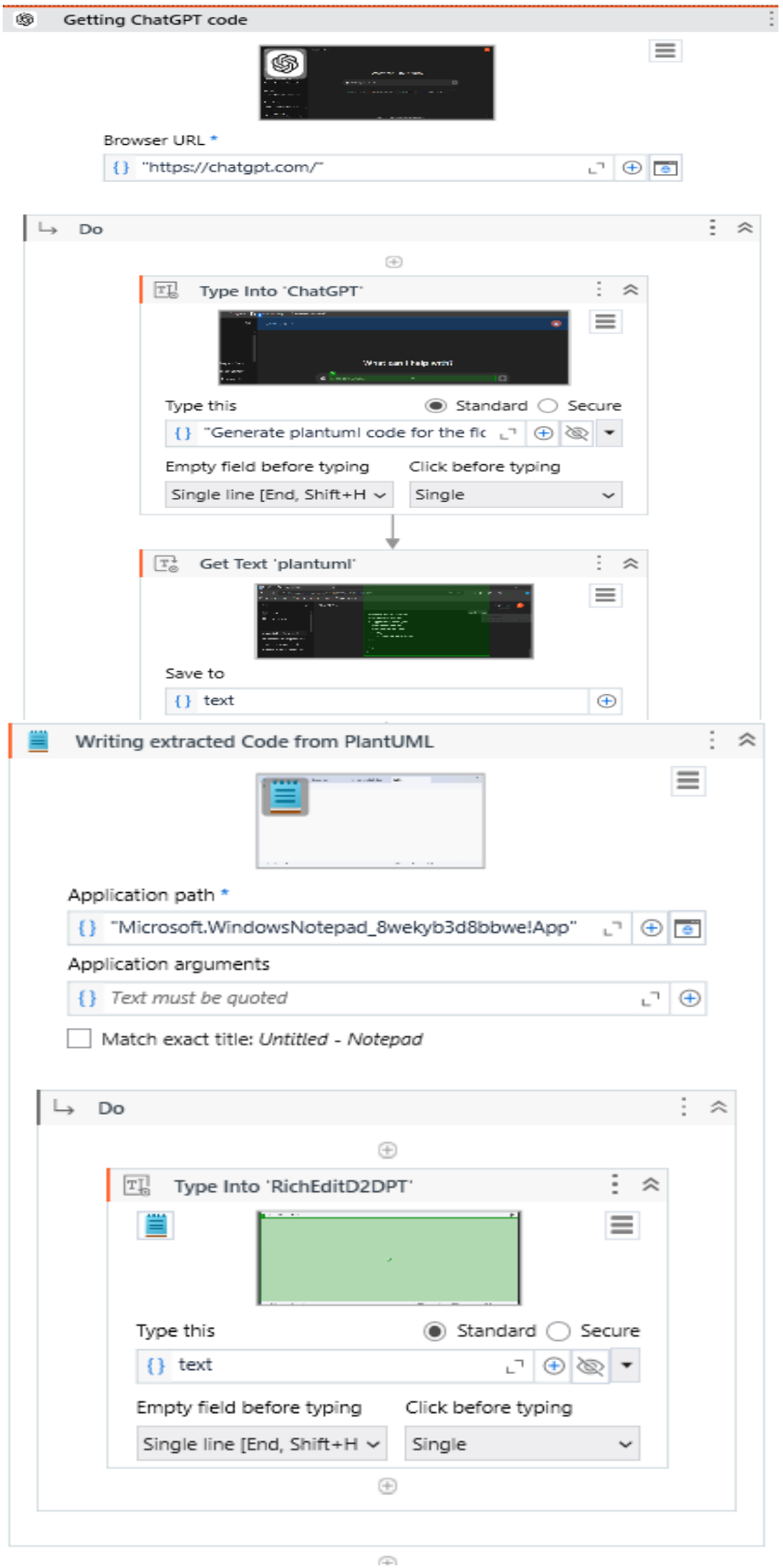
Future iterations of the "Flowchart Generator Bot" could include transitioning the bot into a UiPath App within the Advanced RPA suite. This enhancement would facilitate seamless integration with a broader range of UML and software diagramming tools, offering users the ability to generate not only flowcharts but also class diagrams, sequence diagrams, activity diagrams, and more.

This project establishes a strong foundation for automation in process visualization, contributing to improved productivity and precision in professional and academic settings. Its successful implementation highlights the potential of RPA and AI in transforming workflow automation and diagrammatic representation.

APPENDIX

PROCESS WORK FLOW

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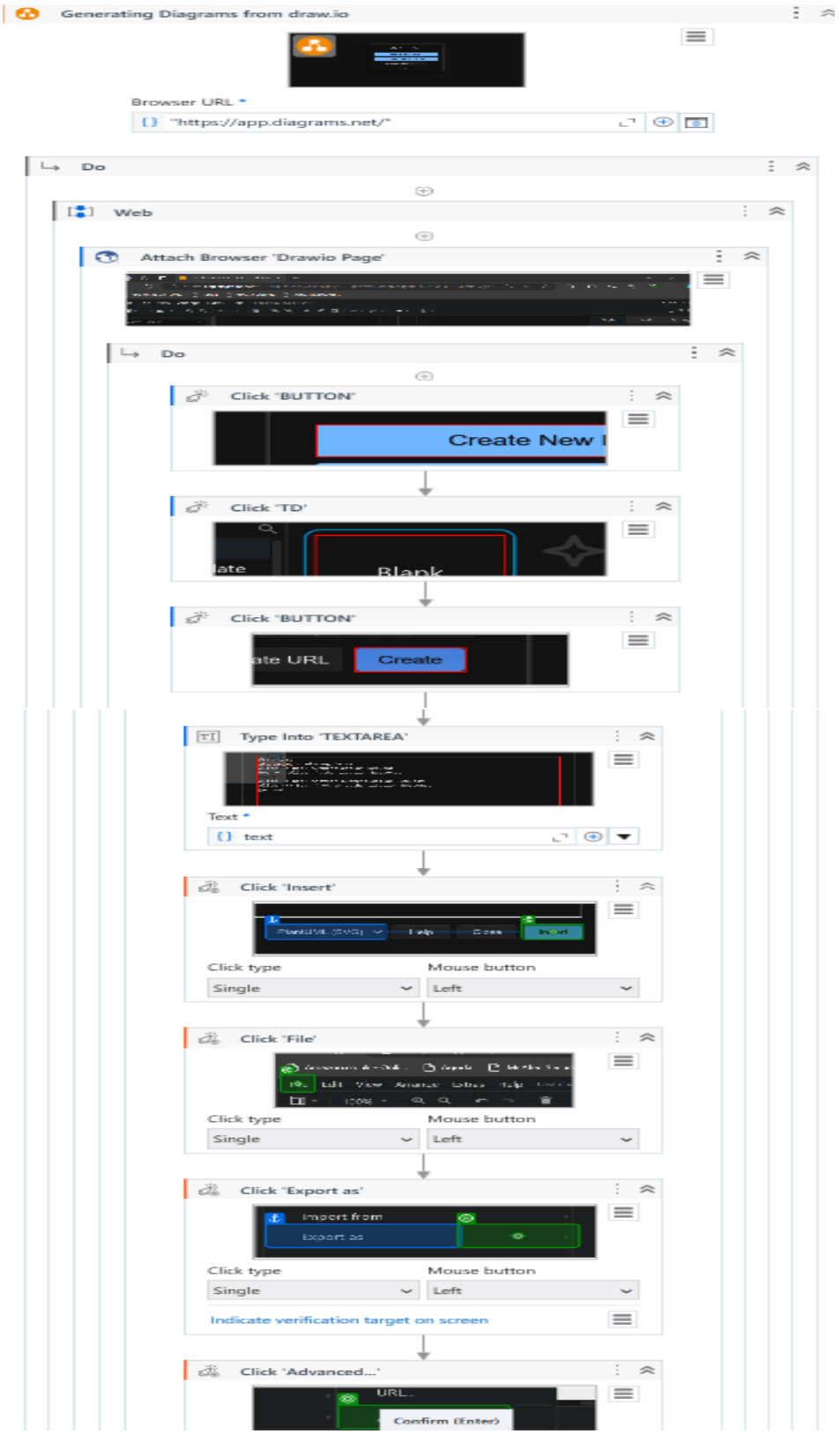
Generating Diagrams from draw.io
Browser URL *
"https://app.diagrams.net/"
Do
Web
Attach Browser 'Drawio Page'
Do
Click 'BUTTON'
Create New
Click 'TD'
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Click 'BUTTON'
Create
Type Into 'TEXTAREA'
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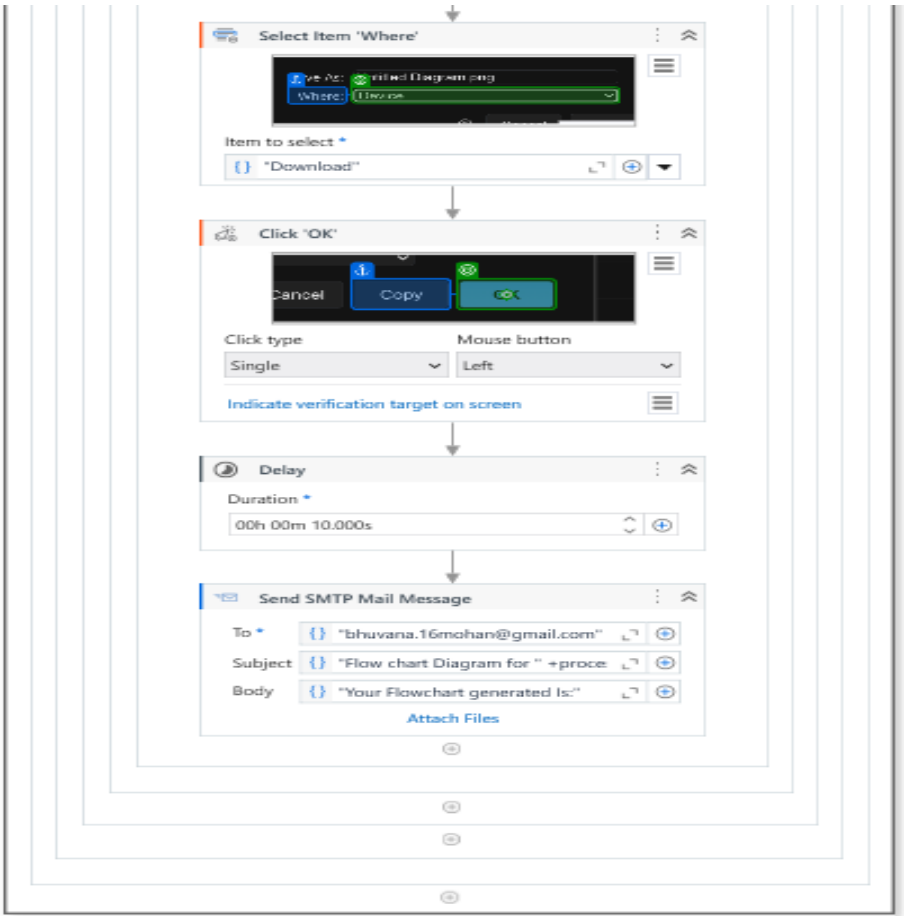
Indicate verification target on screen
Click 'Advanced...'
URL
Confirm (Enter)



The above process represents the workflow to generate the flowchart Generator Bot.

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