

# **COURSE SCHEDULER AUTOMATION**

## **A PROJECT REPORT**

*Submitted by*

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**BONAFIDE CERTIFICATE**

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## **ABSTRACT**

The "**Course Scheduler automation**" is an innovative automated system developed using Robotic Process Automation (RPA) to streamline the creation and management of personalized course schedules. This project addresses the challenges of traditional scheduling processes, such as time consumption, inefficiency, and the potential for human errors. By leveraging UiPath, the bot automates the workflow, minimizing manual intervention and ensuring accurate, timely delivery of schedules to users.

The bot begins its operation by reading course availability and user preference data from Excel sheets. It processes these inputs by iterating through user-specific requirements and matching them with the available courses. This matching process adheres to predefined rules to ensure that the most suitable courses are selected for each user based on preferences like timing, difficulty level, and availability.

Once the courses are matched, the bot compiles the finalized schedules into a structured data table and writes them back into an Excel file for documentation. To enhance user experience and professionalism, the bot generates personalized notifications using Word templates, which are then converted into PDF files. These PDFs are emailed to the users using SMTP protocols, ensuring secure and direct communication.

The **Course Scheduler automation** eliminates the repetitive and error-prone tasks of manual scheduling, offering a scalable and efficient solution for educational institutions or individuals. Its ability to handle large volumes of data, personalize outputs, and deliver notifications efficiently makes it a powerful tool for modern educational management.

Furthermore, the bot's architecture is modular, enabling customization and scalability for future-enhancements.

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## LIST OF ABBREVIATIONS

ABBREVIATION	ACCRONYM
RPA	Robotic Process Automation
SMTP	Simple Mail Transfer Protocol
PDF	Portable Document Format
SQL	Structured Query Language
CSV	Comma-Separated Values

# CHAPTER 1

## INTRODUCTION

### 1.1 INTRODUCTION

The "**Course Scheduler automation**" is an advanced automation solution designed to address the challenges of personalized course scheduling in educational settings. Built using Robotic Process Automation (RPA) with UiPath, this bot eliminates the inefficiencies of traditional scheduling methods by automating the entire process, from gathering user preferences to generating and delivering customized schedules.

Course scheduling is often a time-consuming task requiring administrators to match student preferences with available courses manually. This approach is prone to delays, errors, and inefficiencies, especially when handling large datasets. The **Course Scheduler automation** streamlines this process by automating the workflow, ensuring quick, accurate, and consistent scheduling.

The bot dynamically matches user preferences with course availability, generates a structured schedule, and formats it into professional PDF documents. Using SMTP protocols, it delivers personalized notifications, ensuring timely communication with users. By leveraging the power of RPA, the **Course Scheduler automation** not only reduces manual effort but also enhances the reliability and scalability of course scheduling systems, making it an ideal solution for modern educational institutions.

This project demonstrates the potential of RPA to transform traditional administrative processes. By integrating advanced tools like Excel for data



handling and email for communication, the bot offers a user-friendly, scalable, and efficient approach to personalized course scheduling.

The **Course Scheduler automation** serves as a practical example of how automation can improve educational workflows, fostering better resource management and user satisfaction. It also lays the foundation for integrating more advanced features in future iterations, such as real-time updates and dynamic constraint handling.

The **Course Scheduler automation** not only simplifies course scheduling but also ensures a high level of personalization by accommodating user preferences and constraints. Its modular design allows for easy integration with existing systems and the flexibility to adapt to changing requirements. By automating repetitive tasks, it enables educators and administrators to focus on more strategic activities, ultimately enhancing the overall efficiency of educational management.

## 1.2 OBJECTIVE

The objective of the **Course Scheduler automation** is to automate and simplify the process of personalized course scheduling by leveraging Robotic Process Automation (RPA). The bot is designed to efficiently collect user preferences, analyze course availability, and generate optimized schedules tailored to individual requirements. By automating tasks such as data processing, matching courses to user preferences, and sending personalized

notifications via email, the bot minimizes manual effort, reduces errors, and ensures timely communication. This project aims to enhance the overall efficiency and accuracy of course scheduling systems, providing a scalable solution that caters to the dynamic needs of educational institutions and individual users.

### **1.3 EXISTING SYSTEM**

The existing system for course scheduling is largely manual and timeconsuming, requiring administrators to match user preferences with available courses and communicate schedules individually. This process is prone to human errors, such as incorrect assignments or delays in notification. Managing large volumes of data manually becomes increasingly inefficient, leading to inconsistencies and significant administrative effort. These limitations highlight the need for automation to streamline the scheduling process, minimize errors, and ensure timely delivery of personalized course schedules.

### **1.4 PROPOSED SYSTEM**

The **Course Scheduler automation** offers an automated and efficient alternative to traditional manual course scheduling. Using Robotic Process Automation (RPA) with UiPath, the bot handles the end-to-end process of collecting user preferences, analyzing course availability, and matching

preferences with available courses. By automating repetitive and error-prone tasks, the bot ensures accuracy and consistency in scheduling. It processes input data from Excel sheets, applies predefined rules to generate personalized schedules, and organizes the output into a structured format, eliminating the need for manual intervention.

In addition to creating schedules, the bot enhances communication by generating professional PDF notifications using Word templates and dispatching them via email using SMTP protocols. This ensures that users receive their schedules promptly and accurately. By integrating automation tools into the workflow, the **Course Scheduler automation** not only saves time and effort but also provides a scalable solution capable of managing large datasets and diverse user preferences, making it an ideal choice for educational institutions and individuals.

## **CHAPTER 2**

### **LITERATURE REVIEW**

#### **2.1 Survey on Robotic Process Automation (RPA) in Course Scheduling automation:**

Robotic Process Automation (RPA) is increasingly being applied to educational management systems to automate routine administrative tasks, particularly course scheduling. In this domain, RPA has shown significant potential in automating repetitive tasks like processing user preferences, matching courses, and generating schedules. Current research highlights how RPA reduces the workload of administrators by eliminating manual data handling, matching, and communication processes. However, challenges persist in the widespread adoption of RPA in scheduling systems, including integration with existing institutional systems and the need for customization based on specific academic requirements.

Relevant research papers related to RPA in education include: [1] A study discusses how RPA and other digital technologies are transforming educational workflows, such as course scheduling. By automating tasks like matching student preferences with course availability, RPA reduces administrative burden, allowing institutions to manage schedules efficiently.

[2] A paper from IJITEE highlights RPA's effectiveness in automating student management tasks, including course scheduling. The study emphasizes the time-saving benefits of RPA and its cost-effectiveness, particularly for institutions with large datasets and limited resources.

## **2.2 Survey on Automation in Personalized Student Course Scheduling:**

The automation of personalized course scheduling is a growing area of interest, with RPA being used to create optimal schedules based on student preferences and course availability. These systems significantly reduce manual effort and ensure timely communication of schedules. While existing systems provide basic automation, challenges such as scalability, handling diverse preferences, and ensuring personalized experiences remain. [1] Research emphasizes the role of automation in personalized student course scheduling. Automated systems can generate schedules based on student preferences, such as timing, course load, and academic requirements, reducing administrative effort and ensuring consistency.

[2] A study explores the integration of RPA with email systems to deliver mass notifications. It concludes that automation improves the efficiency of communication, especially in terms of personalized and timely course schedule delivery.

### **2.3 Survey on Challenges in Course Scheduling and Proposed Integration with RPA:**

Manual course scheduling presents several challenges, such as human error, inefficiency in managing preferences, and delays in communication. Research highlights the difficulties involved in manually processing large volumes of data, which can lead to incorrect course allocations and scheduling conflicts. Automation is seen as a solution to overcome these issues by providing more accurate and timely course assignments.

[1] A study reviews traditional course scheduling systems and identifies common inefficiencies, such as time-consuming manual processes and difficulties in accommodating diverse student preferences. It advocates for the adoption of RPA to enhance operational efficiency and reduce errors. [2] A paper explores the limitations of current course scheduling tools and highlights the potential of RPA in addressing these challenges. It emphasizes that automation can improve scheduling accuracy, reduce manual effort, and ensure timely communication of course assignments.

### **2.4 Summary of the Intersection of RPA and Course Scheduling:**

The **Course Scheduler automation** integrates RPA technology to automate course scheduling workflows. This innovative system matches student preferences with available courses, generates personalized schedules, and delivers them via email—all with minimal human intervention. By automating data processing, schedule creation, and communication, the bot ensures accuracy and saves time.

This project bridges the gap between traditional course scheduling systems and modern automation, offering a robust, scalable, and cost-effective solution. The integration of RPA in this context highlights its transformative potential, improving the efficiency of educational management while

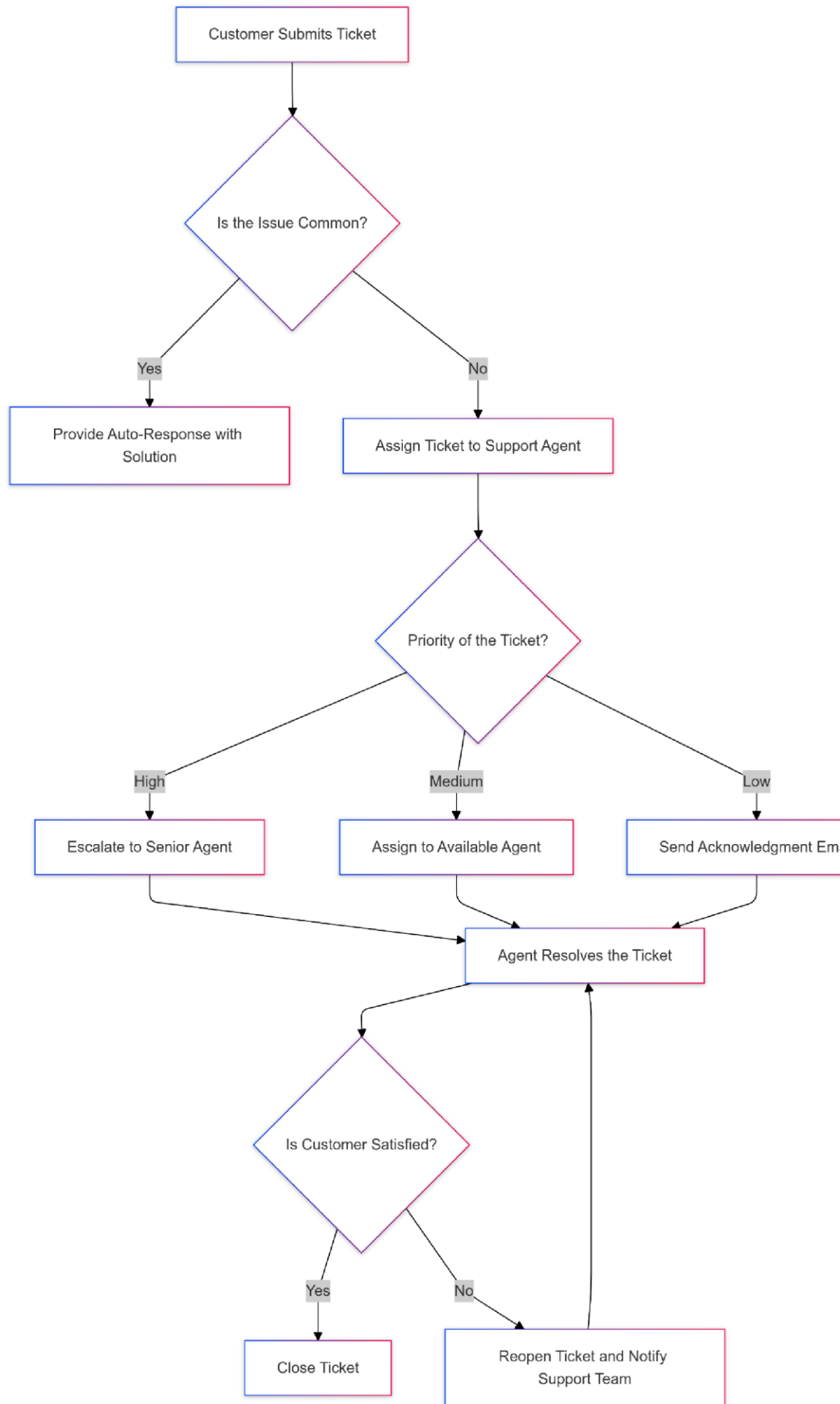
ensuring better communication between students and administrators. By automating personalized scheduling, the bot enhances user satisfaction and operational productivity in academic institutions.

## **CHAPTER 3**

### **SYSTEM DESIGN**

#### **3.1 SYSTEM FLOW DIAGRAM**

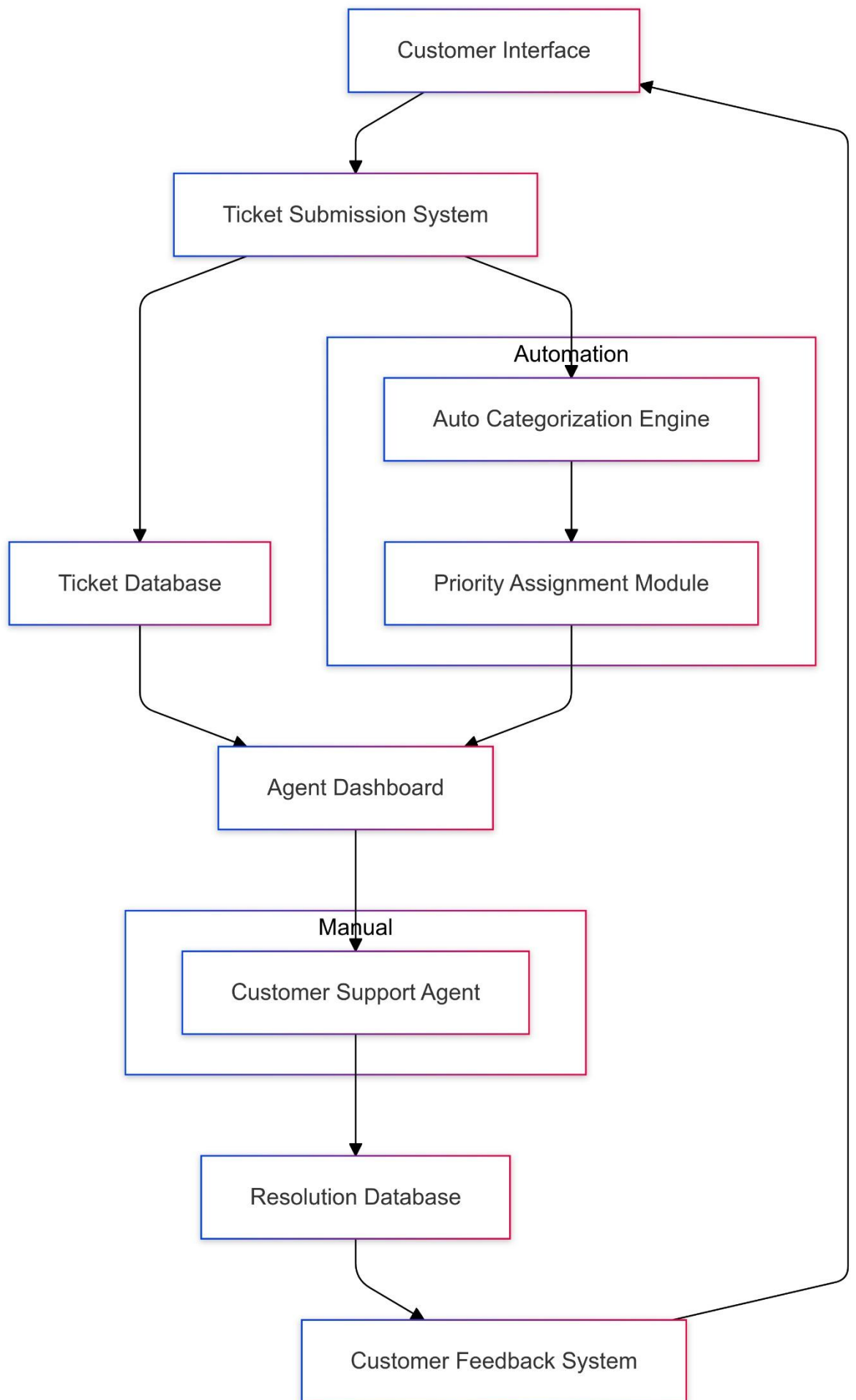
A flowchart is a type of diagram that represents an algorithm, workflow or process. The flowchart shows the steps as boxes of various kinds, and their order by connecting the boxes with arrows. This diagrammatic representation illustrates a solution model to a given problem.



### **3.2 ARCHITECTURE DIAGRAM**

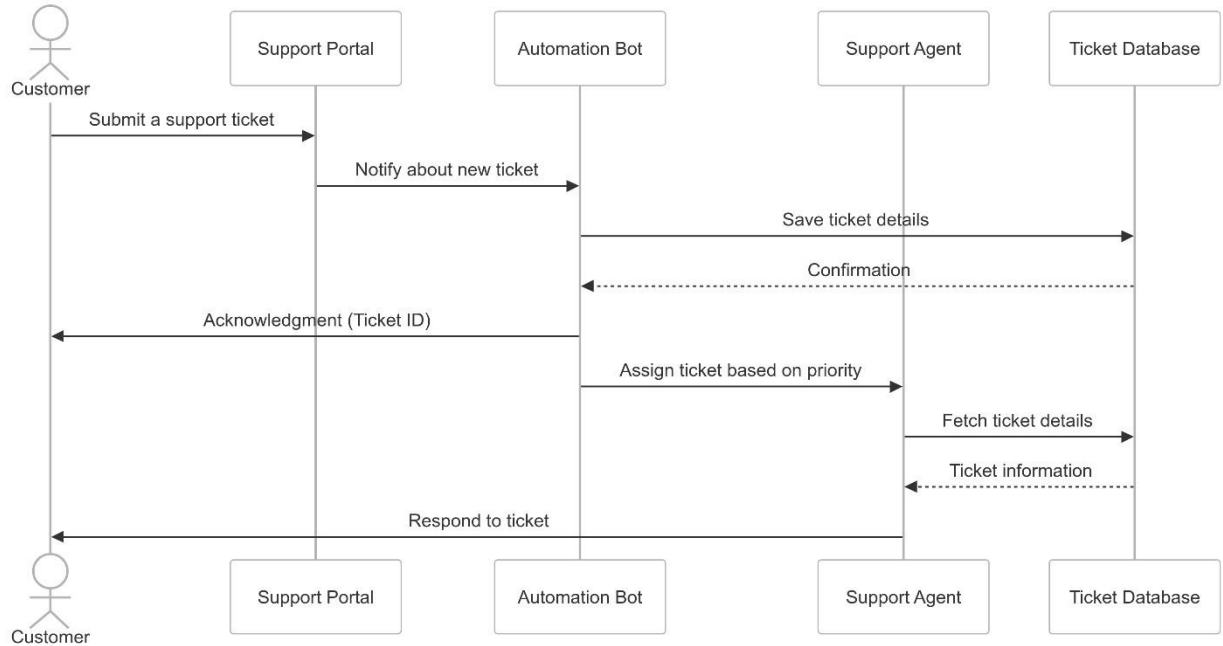
An architecture diagram is a graphical representation of a set of concepts, that are part of an architecture, including their principles, elements and components.





### 3.3 SEQUENCE DIAGRAM

A sequence diagram is a type of interaction diagram because it describes and how in what order a group of objects works together.



## CHAPTER 4

### PROJECT DESCRIPTION

The **Course Scheduler automation** is a comprehensive automation project designed to streamline the process of creating personalized course schedules. This project utilizes Robotic Process Automation (RPA) with UiPath to automate key tasks, such as reading user preferences, matching them with available courses, generating schedules, and sending notifications. The bot minimizes human intervention, ensuring accuracy, efficiency, and timely communication in course scheduling.

## **4.1. MODULES:**

### **4.1.1. INPUT HANDLING AND INITIALIZATION:**

**4.1.1.1. File Selection:** • The bot begins by collecting input data, including user preferences and course availability, from an Excel file

**4.1.1.2. Data Initialization:**

- Load the Excel file containing course records.
- Data is validated and initialized to ensure compatibility with the processing workflow.

### **4.1.2 COURSE MATCHING AND SCHEDULING:**

**4.1.2.1 Preference Analysis:**

- Iterate through each row of the Excel sheet.
- Extract and analyze data such as preferred time slots, course difficulty levels, and prerequisites.

**4.1.2.2 Course Availability Matching:** • Match courses based on predefined rules, such as time compatibility and fulfillment of prerequisites

- Flag conflicts or unmatched preferences for further review.

### **4.1.3 SCHEDULE COMPILATION:**

**4.1.3.1 Notification Creation:**

- Use a predesigned Word template to generate personalized course schedules for each user

#### **4.1.3.2 PDF Conversion:**

- Convert the generated Word documents into PDF format for consistency and professional communication.

### **4.1.4 EMAIL NOTIFICATION:**

#### **4.1.4.1 Email Preparation:**

- Extract the student email addresses from the Excel file.
- Attach the generated PDF notification for each flagged student.

#### **4.1.4.2 Email Dispatch:**

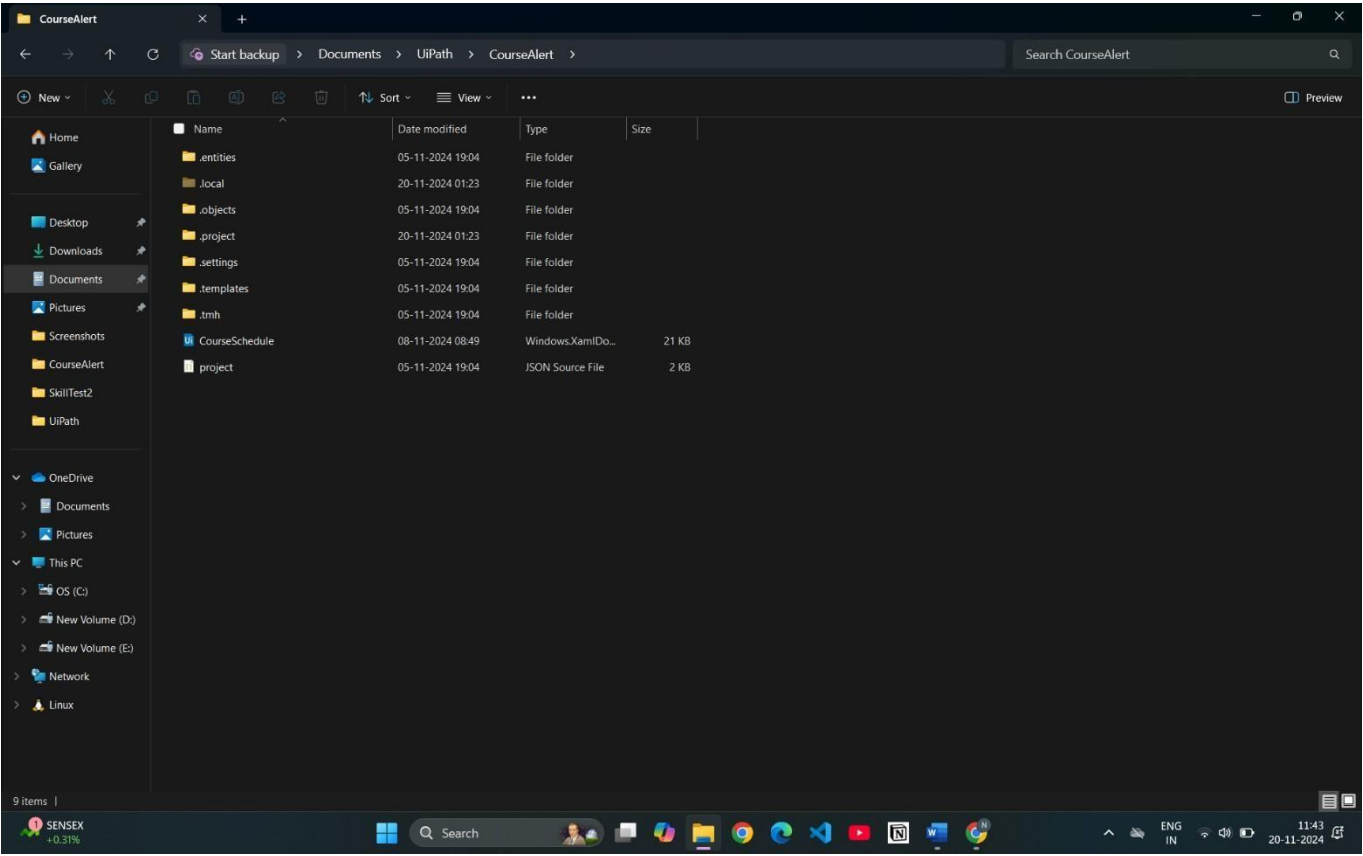
- Use SMTP services to send personalized emails to students.
- Include a message summarizing their Course Schedule and attach the notification PDF.

#### **4.1.4.3 Completion Notification:**

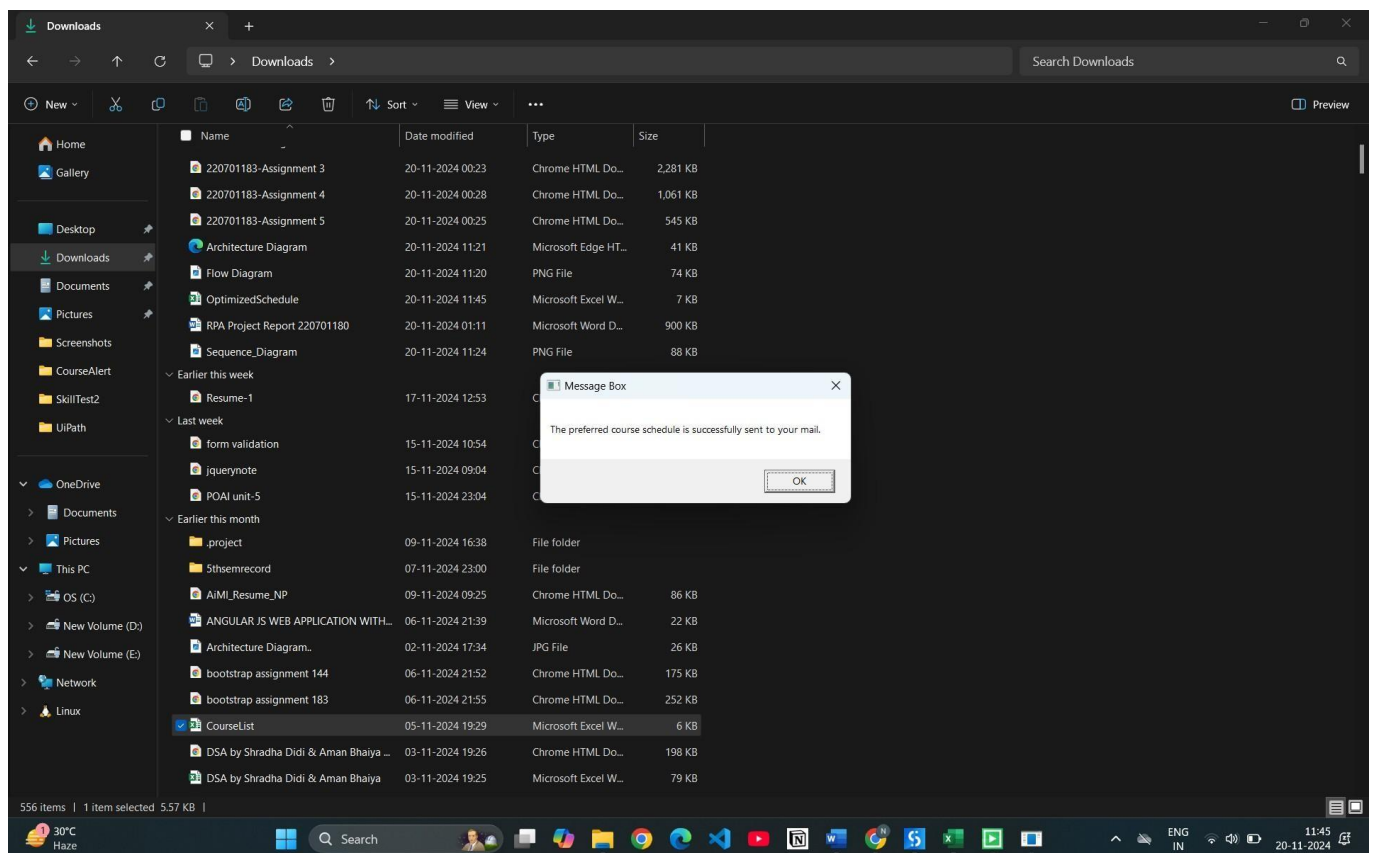
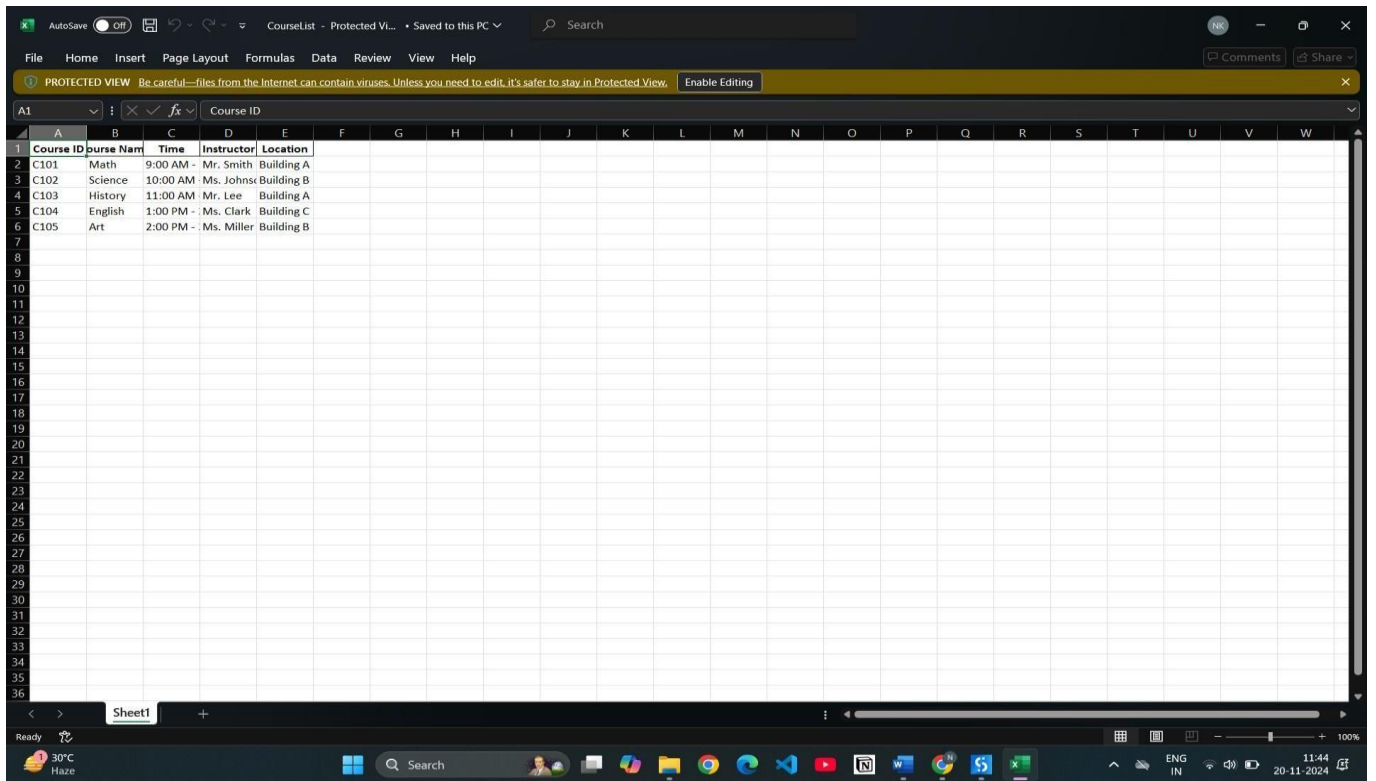
- Display a completion message upon successful email dispatch for all flagged students.

## **CHAPTER 5**

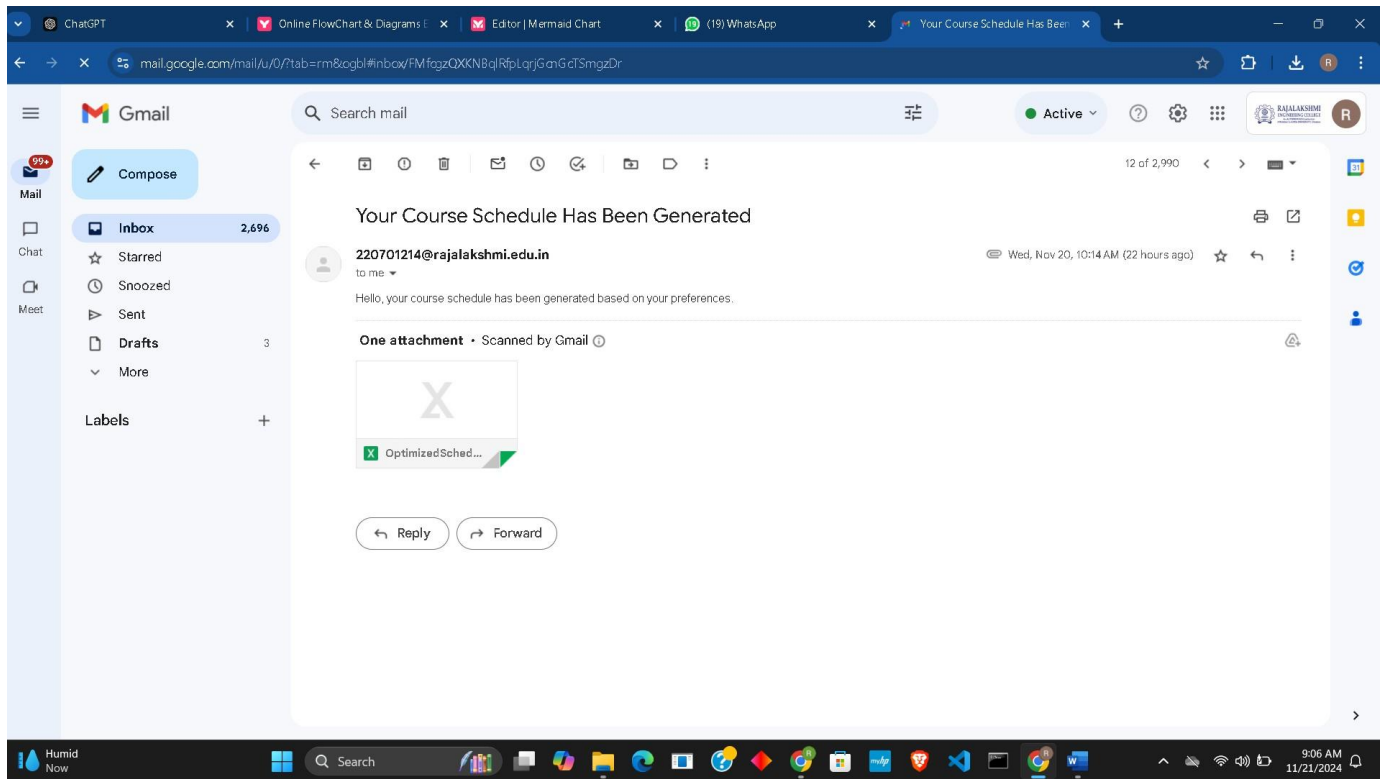
# OUTPUT SCREENSHOTS



The data is fetched from the user preferences and course availability file.



After replacing name, saved as a PDF file with the 'Save as PDF' activity.



## CHAPTER 6

### CONCLUSION

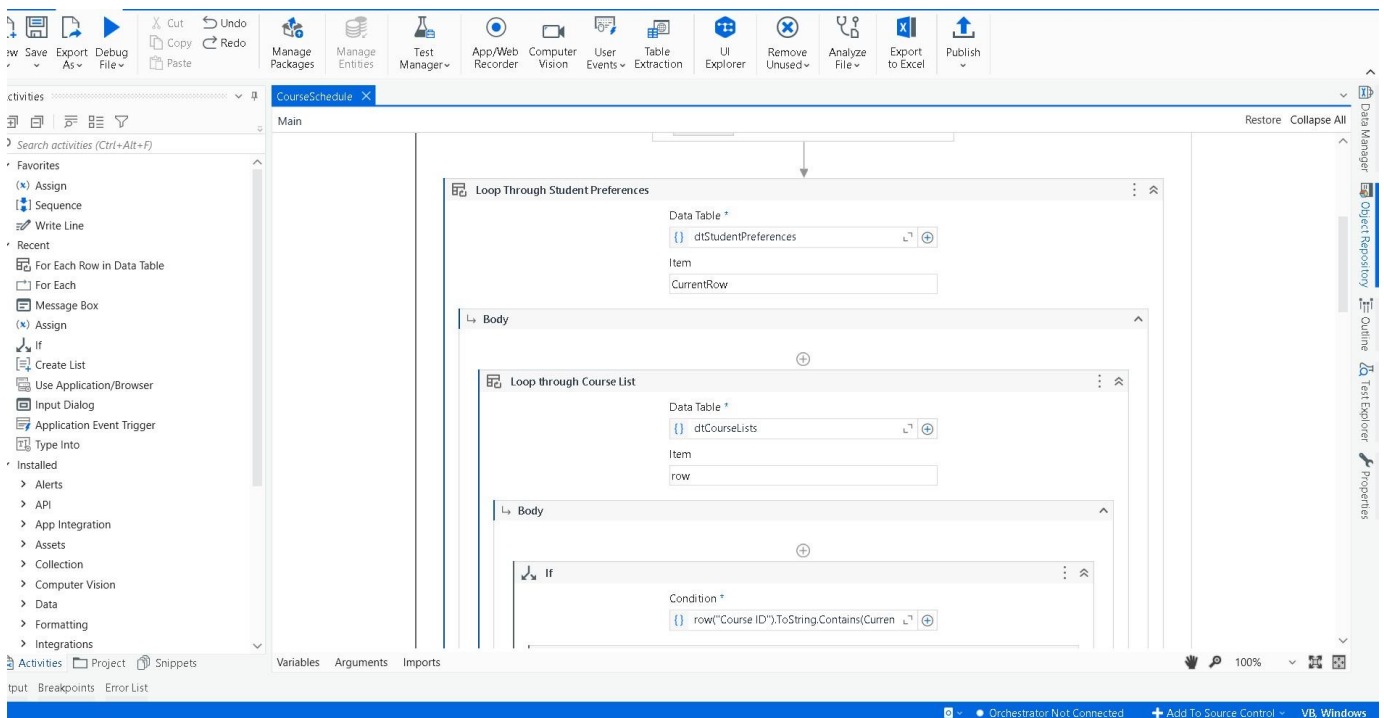
The **Course Scheduler Automation** successfully demonstrates the potential of Robotic Process Automation (RPA) in streamlining the process of personalized course scheduling. By automating tasks such as collecting user preferences, matching them with available courses, generating structured schedules, and delivering notifications via email, the bot minimizes manual intervention, reduces errors, and ensures timely communication.

This project highlights the scalability and efficiency of RPA in managing complex workflows, making it a valuable tool for educational institutions and individual users. The bot not only saves time and effort but also enhances user satisfaction by providing a reliable and professional scheduling solution.

While the current implementation addresses the key challenges of manual scheduling, there is scope for future enhancements, such as real-time data integration, conflict resolution algorithms, and advanced customization options. The success of the **Course Scheduler Automation** reinforces the importance of automation in modernizing educational management systems and lays a strong foundation for further innovation.

## APPENDIX

### PROCESS WORK FLOW





ts

If

Condition \*

{ } row("Course ID").ToString.Contains(Curren L<sup>7</sup> +)

Then

+

If

Condition \*

{ } row("Time").ToString.Contains(CurrentRow L<sup>7</sup> +)

Then

+

If

Condition \*

{ } row("Instructor").ToString.Contains(Curren L<sup>7</sup> +)

Then

+

If

Condition \*

{ } Not row("Time").ToString.Contains(Curren L<sup>7</sup> +)

1

