EMPLOYEE ATTENDANCE MANAGEMENT BOT

A MINI-PROJECT REPORT

Submitted By

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in partial fulfilment for the course

OAI1903 - INTRODUCTION TO ROBOTIC PROCESS AUTOMATION

for the degree of

BACHELOR OF ENGINEERING

IN

COMPUTER SCIENCE AND ENGINEERING

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NOV/DEC,2024

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BONAFIDE CERTIFICATE

Certified that this project report **"Employee Attendance Management System"** is the Bonafide work of **"Bhuvaanesh R 220701045"** who carried out the project work for the subject OAI1903-Introduction to Robotic Process Automation under my supervision.

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ACKNOWLEDGEMENT

ABSTRACT

The "Employee Attendance Management System" is an innovative RPA solution designed using UiPath Studio to automate employee attendance tracking and daily working hour calculations. This system processes employee data, including Employee ID, Name, Check-in, and Check-out times, from an Excel file, validating entries against company policies. Employees are marked as late for checking in after the permitted time and as working overtime for staying beyond official hours.The system leverages UiPath Studio to automate the workflow, beginning with video-to-audio conversion using FFmpeg, followed by transcription via the Google Speech-to-Text API. The transcribed text is summarized using a natural language processing model from UiPath AI Center. Managed through UiPath Orchestrator, the workflow ensures task automation, error handling, and resource optimization, making the process efficient and reliable.

The bot efficiently computes total working hours in decimal format and generates detailed attendance reports highlighting employee status (e.g., Present, Late, Overtime). These reports are saved in a new Excel file, ensuring precision and reducing manual intervention.

Integrated with UiPath Orchestrator, the bot is scheduled to run automatically at the end of each day, producing comprehensive reports for HR or payroll systems. The system enhances operational efficiency, streamlines attendance management, and provides actionable insights into workforce productivity. Its scalability and customization capabilities make it a robust tool for modern organizational needs.

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LIST OF ABBREVIATIONS

Abbreviation	Full Form
RPA	Robotic Process Automation
UI	User Interface
XAML	Extensible Application Markup Language (for UiPath workflows)
UiPath	A Robotic Process Automation (RPA) tool
TFS	Text File Storage
JSON	JavaScript Object Notation
CSV	Comma Separated Values

CHAPTER – 1

INTRODUCTION

1.1 GENERAL

Employee attendance management is a critical operational function for organizations, directly influencing productivity, workforce planning, and payroll accuracy. Traditional attendance systems often rely on manual tracking methods or standalone software, which are prone to errors, inefficiencies, and delays. As organizations expand, these systems struggle to maintain accuracy and scalability.

The advent of Robotic Process Automation (RPA) offers a transformative approach to addressing these challenges. By automating repetitive and time-consuming tasks like attendance tracking, late entry detection, and overtime calculation, RPA ensures precision, reduces manual effort, and enhances operational efficiency. The Employee Attendance Management System, developed using UiPath Studio, exemplifies this transformation.

This project automates the entire attendance management process, from reading employee data in an Excel file to generating comprehensive daily attendance reports. It integrates seamlessly with UiPath Orchestrator, enabling end-of-day automation for generating reports that are ready for HR or payroll systems.

1.2 OBJECTIVE

The objective of this project is to design and implement a robust, automated system to manage employee attendance efficiently. The specific goals include:

- **Data Input Processing:** Read employee attendance data (Employee ID, Name, Check-in, Check-out times) from an Excel file.
- **Policy Validation**: Validate Check-in and Check-out times against company policies to flag late arrivals and record overtime.
- **Total Hours Calculation:** Compute total working hours for each employee in decimal format for accurate reporting.

- **Comprehensive Report Generation:** Create detailed daily reports indicating employee status (Present, Late, Overtime) and working hours.
- **Automation and Scheduling:** Integrate with UiPath Orchestrator to schedule daily execution at the End of Day (EOD) for report generation.

1.3 EXISTING SYSTEM

Existing attendance management systems face several limitations:

- **Manual Effort**: Reliance on manual data entry and validation introduces errors and inefficiencies.
- **Standalone Software**: Legacy systems often lack integration capabilities, requiring manual intervention for report generation.
- **Scalability Issues**: As organizations grow, these systems struggle to handle large volumes of employee data effectively.
- **Limited Insights**: Existing methods fail to provide actionable insights into workforce productivity and trends.

1.4 PROPOSED SYSTEM

The proposed **Employee Attendance Management System** offers an advanced, end-to-end automated solution. Key features include:

1. **Automation of Attendance Tracking:** The bot automates the processing of employee attendance data from Excel, ensuring accuracy and consistency.

2. **Policy Validation and Marking:** The system flags late arrivals and calculates overtime based on predefined company policies.

3. **Efficient Reporting:** Generates detailed reports with employee status and working hours, formatted for easy integration with HR and payroll systems.

4. **UiPath Orchestrator Integration:** Scheduled execution at the EOD ensures timely and error-free reporting without manual intervention.

5. **Scalable and Customizable Design:** The system is adaptable to varying organizational requirements and policies.

CHAPTER - 2

LITERATURE REVIEW

2.1 GENERAL

The management of employee attendance is a crucial aspect of organizational operations, directly impacting productivity, payroll accuracy, and compliance with company policies. Traditional attendance systems, often manual or semi-automated, are labor-intensive, error-prone, and inefficient. These challenges have led to a growing interest in adopting Robotic Process Automation (RPA) for attendance management.

Recent advancements in RPA and automation tools like UiPath have opened new possibilities for optimizing attendance systems. By integrating data processing, validation, and report generation into a unified workflow, RPA-based solutions address the limitations of traditional methods. This chapter reviews relevant tools, technologies, and methodologies that contribute to the development of an automated Employee Attendance Management System.

2.2 DATA INPUT AND VALIDATION

Efficient attendance systems require accurate and timely data input. The use of Excel as a data source is widely acknowledged due to its versatility and compatibility with automation tools. UiPath offers built-in activities for reading, writing, and processing Excel data, ensuring seamless integration into workflows.

Existing Systems

- **Manual Systems:** Require HR personnel to track attendance data, validate entries, and compute working hours. These methods are prone to human errors and inconsistencies, particularly in larger organizations.

- **Biometric Systems:** While these provide accurate Check-in and Check-out times, the data often needs manual processing for policy validation and reporting.

- **Standalone Software:** Proprietary attendance software often lacks integration with payroll systems or scalability for growing organizational needs.

Challenges Addressed by RPA

RPA solutions like UiPath overcome these limitations by automating repetitive tasks, validating data against predefined policies, and eliminating human error. This ensures real-time processing and enhances data accuracy.

2.3 POLICY VALIDATION AND WORKING HOURS CALCULATION

Policy validation is a critical step in attendance management. Companies enforce rules around permissible Check-in times and working hour thresholds. Late arrivals and overtime calculations are essential for compliance and payroll accuracy.

Rule-Based Automation

UiPath excels in implementing rule-based logic for validating Check-in and Check-out times. Activities like If, Switch, and Flow Decision allow dynamic handling of policy rules, ensuring scalability and customization.

Decimal Time Conversion

The conversion of working hours into decimal format is a common requirement for payroll systems. UiPath provides built-in functions for time calculations, allowing precise computation of total hours worked, late arrivals, and overtime.

2.4 REPORT GENERATION

Detailed reporting is a cornerstone of attendance management. Reports must include employee status (e.g., Present, Late, Overtime) and total working hours. Traditional reporting methods are manual and time-consuming, whereas automated systems streamline this process.

UiPath Reporting Features

- **Excel Automation:** UiPath facilitates dynamic generation of reports in Excel, including formulas, formatting, and data visualization.

- **Custom Templates:** Customizable Excel templates ensure reports meet organizational requirements.

- **Error Handling:** UiPath's exception handling ensures that report generation continues seamlessly even in the presence of data inconsistencies.

2.5 INTEGRATION WITH UIPATH ORCHESTRATOR

UiPath Orchestrator enhances the automation process by providing scheduling, monitoring, and centralized management capabilities.

Existing Systems

- Manual scheduling of daily tasks increases dependency on human intervention.

- Limited monitoring tools result in delayed identification of process failures.

**Advantages of UiPath Orchestrator**

- **EOD Automation:** Automatically triggers the bot at the End of Day (EOD) to generate attendance reports without manual initiation.

- **Centralized Management:** Enables HR personnel to monitor bot performance and access reports from a single platform.

- **Scalability:** Supports multiple bots and workflows, ensuring scalability for growing organizational needs.

CHAPTER – 3
SYSTEM DESIGN

3.1 SYSTEM FLOW DIAGRAM

The system flow diagram outlines the key steps in the video summarization process. It begins with the user providing the video file path and output audio file name. The system validates the file name, extracts audio using FFmpeg, and invokes a Python script for audio-to-text conversion. The generated text is processed by an ML Skill in UiPath for summarization. The summarized text is then displayed to the user. The diagram highlights decision points, validations, and integrations, ensuring a clear representation of the workflow.

Figure 1 SYSTEM FLOW DIAGRAM
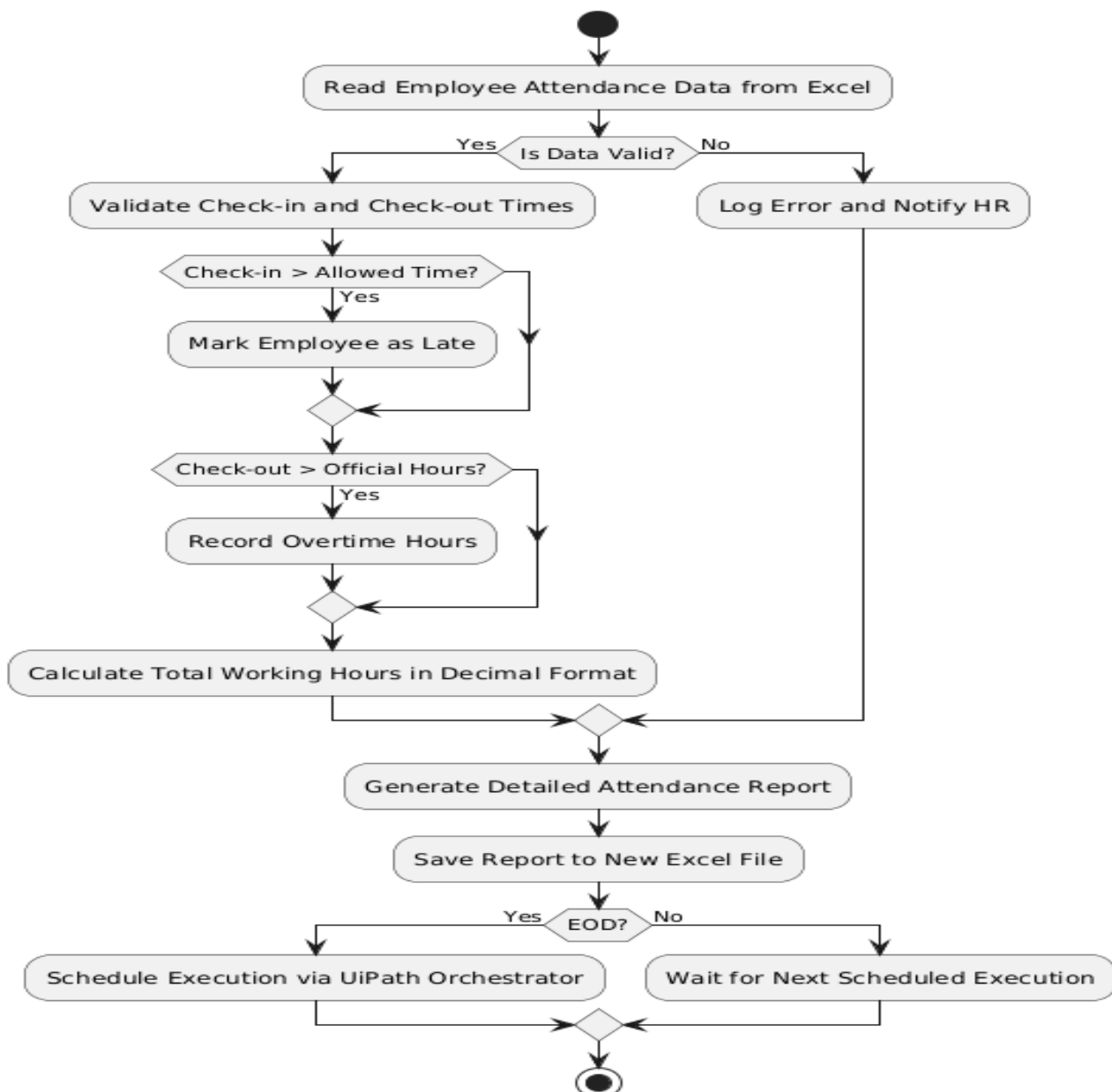
3.2 ARCHITECTURE DIAGRAM

The architecture diagram for the **Employee Attendance Management System** illustrates the components and their interactions within the automated attendance workflow. It highlights the integration of data sources, automation tools, processing stages, and output mechanisms.

Key Components in the Architecture:

1. **Input Data Source:**
   Employee attendance data, including Employee ID, Name, Check-in, and Check-out times, is stored in an Excel file.

2. **Automation Tool (UiPath Studio):**

   o UiPath Studio serves as the core automation engine, executing tasks such as reading data, validating attendance policies, and calculating working hours.

   o Rule-based decision-making ensures compliance with company policies.

3. **Data Processing:**

   o Policy validation identifies late arrivals and records overtime.

   o Total working hours are calculated in decimal format for precision.

4. **Report Generation:**
   A detailed attendance report is generated and saved as a new Excel file.

5. **Orchestrator Integration:**
   UiPath Orchestrator manages and schedules the workflow to run automatically at the End of Day (EOD).

6. **Error Handling and Notifications:**

   o Errors such as missing data or invalid file formats are logged and communicated to HR.
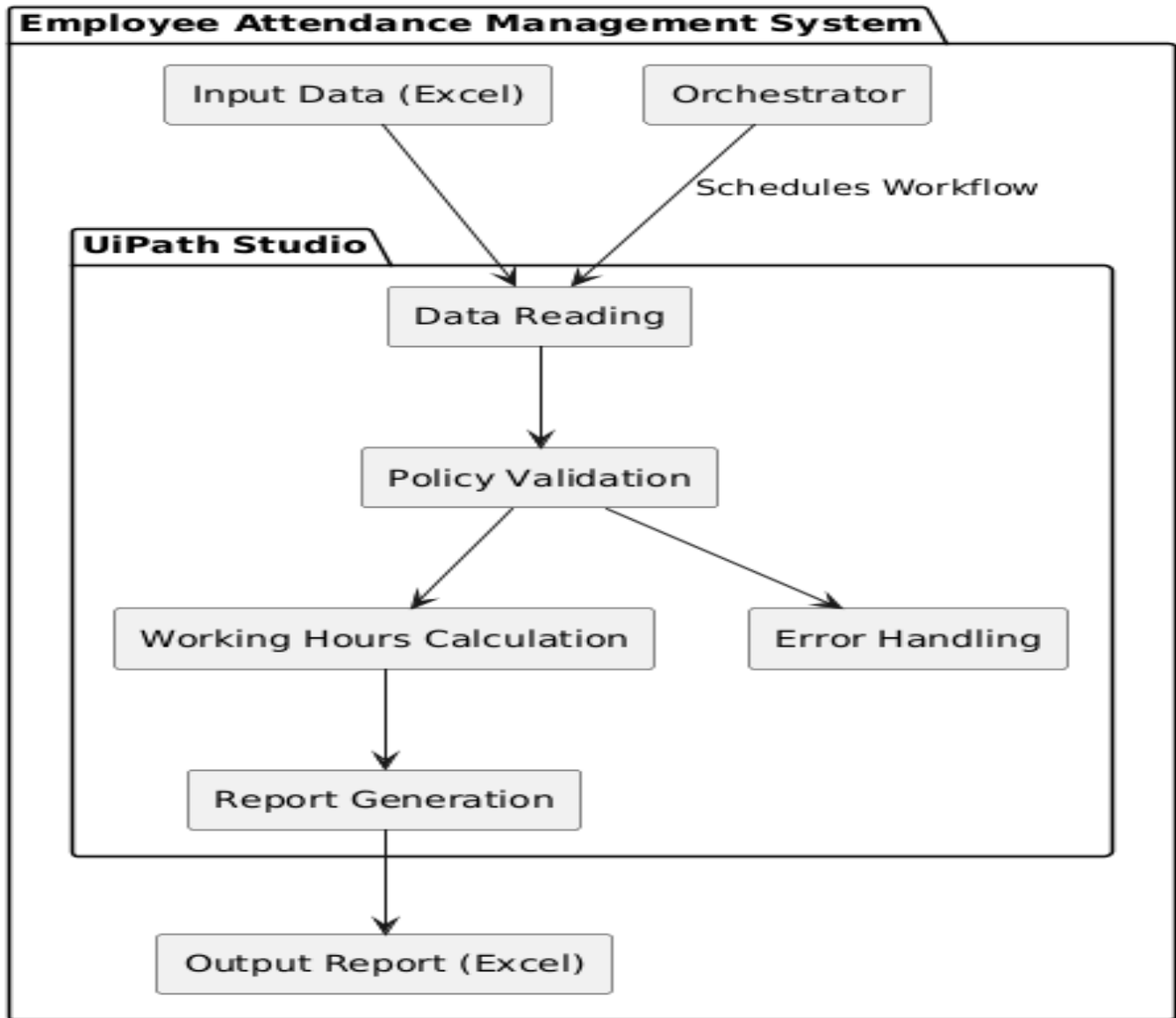
Figure 2 ARCHITECTURE DIAGRAM

3.3 SEQUENCE DIAGRAM

- **User Interaction:**
  The user starts the process by inputting attendance data through an Excel file, which contains employee IDs, check-in, and check-out times.

- **Data Validation:**
  The system validates the data format of the Excel file to ensure it follows

the required structure. If the data is invalid, the system prompts the user to
provide the correct format.

- **Reading Employee Data:**
  The UiPath Studio automation tool reads the attendance data from the
  provided Excel file.
- **Policy Validation & Calculation:**
  UiPath Studio performs the following tasks:

- Validate Attendance Policies: It checks if the check-in and check-out times
  meet company policies (e.g., late arrivals, overtime).

- Calculate Working Hours: It calculates the total working hours, including
  overtime, in decimal format.

- **Report Generation:**
  After processing the data, UiPath Studio generates an attendance report and
  saves it as a new Excel file.
- **Orchestrator Integration:**
  UiPath Orchestrator schedules the workflow to run automatically at the End
  of Day (EOD), ensuring the report is generated daily.
- **Output & Display:**
  Once the report is generated, the system displays the attendance report to
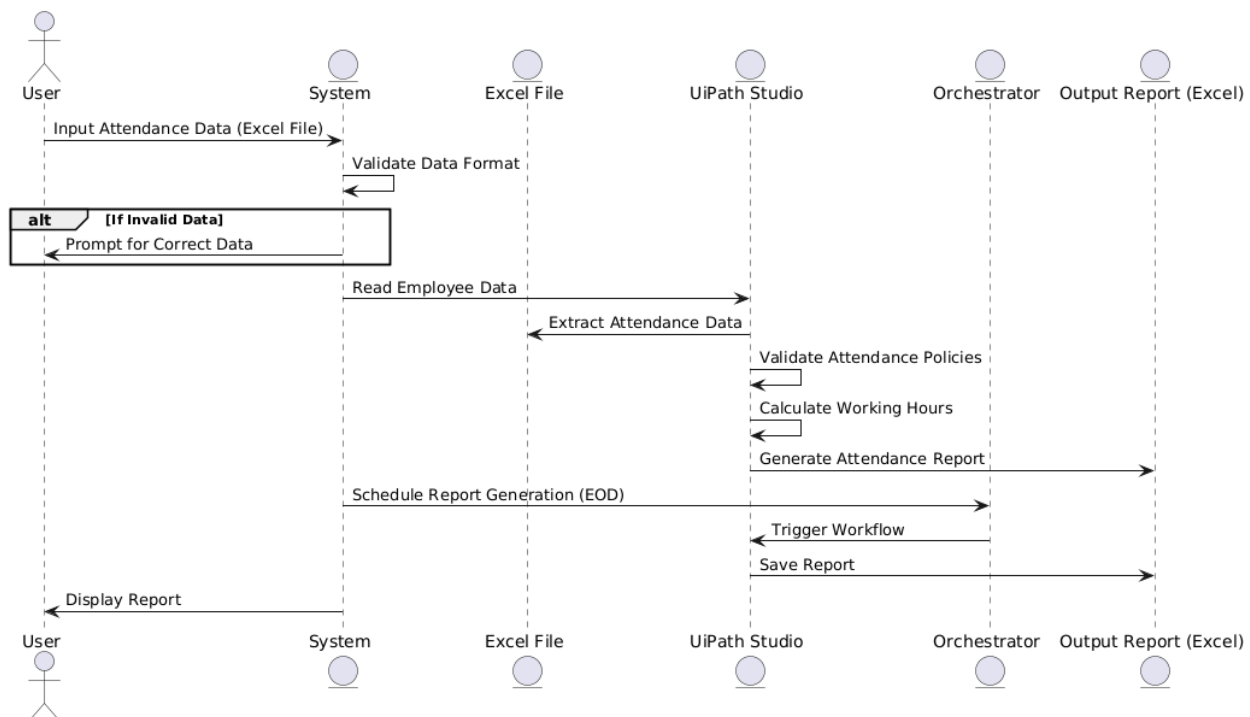 the user.

Figure 3 SEQUENCE DIAGRAM

CHAPTER – 4

PROJECT DESCRIPTION

4.1 METHODOLOGIES

This project integrates advanced technologies to automate the process of employee attendance management, streamlining attendance tracking, working hour calculations, and report generation. The system is divided into several core modules, each responsible for a specific function. These modules work in harmony to provide an efficient, scalable, and accurate solution for managing employee attendance and related tasks.

4.1.1 MODULES

1. **Data Input and Validation**

   o **Tool:** Excel, System Validation Logic

   o **Process:** The first module involves receiving attendance data from employees, typically in an Excel file format containing the employee ID, check-in, and check-out times. The system validates the format of the data to ensure consistency and accuracy. This step ensures the data complies with the company's predefined policies for attendance (e.g., correct time format, required fields). If the data is found to be incorrect or missing, the system prompts the user to rectify the errors before proceeding to the next step.

2. **Attendance Policy Validation and Working Hour Calculation**

   o **Tool:** UiPath Studio

   o **Process:** Once the data is validated, the system uses UiPath Studio to validate employee attendance against the company's policies. This includes checking if the employees have checked in after the allowed time, left early, or worked overtime. Based on this validation, the system calculates the total working hours for each employee, including any overtime hours, in decimal format. The working hours calculation ensures that the company complies with labor laws and company-specific policies regarding work time.

3. **Report Generation**

   o **Tool**: UiPath Studio, Excel

   o **Process:** After calculating the working hours, the system automatically generates an attendance report that details each employee's attendance status (e.g., present, late, overtime). The report is generated in Excel format, and it includes data such as Employee ID, Name, Check-in Time, Check-out Time, Total Hours Worked, and Overtime Hours. This module simplifies the payroll and performance analysis process, ensuring accurate and timely reporting without requiring manual input from HR personnel.

4. **Automation and Scheduling**

   o **Tool:** UiPath Orchestrator

   o **Process:** To enhance operational efficiency, the system integrates with UiPath Orchestrator, which schedules and automates the attendance report generation at the end of each day (EOD). Orchestrator ensures that the process runs automatically without requiring manual intervention, reducing the risk of human error and ensuring timely report delivery for HR or payroll systems. This functionality also allows for scalability, ensuring that the system can handle large volumes of data with ease.

4.2 INTEGRATION AND WORKFLOW

The above modules work together in a seamless workflow, where the system begins by reading the employee attendance data, validating it, and processing it according to company policies. The UiPath Studio automates the calculation of working hours and generates the attendance report. The integration with UiPath Orchestrator ensures that the system runs automatically at the end of each day, delivering the reports in a timely manner.

The combination of these technologies ensures that the Employee Attendance Management System is not only efficient and reliable but also scalable, capable of handling growing volumes of employee attendance data as the organization expands.

By automating these tasks, the project reduces the workload of HR personnel, minimizes errors associated with manual data entry, and provides valuable insights

into employee attendance and working hours, contributing to better payroll management and overall operational efficiency.

CHAPTER – 5
CONCLUSIONS

5.1 GENERAL

This project successfully demonstrates the automation of employee attendance management using UiPath Studio, Excel, and automated workflows. By integrating these technologies, the system efficiently tracks employee attendance, calculates working hours, manages overtime, and generates detailed attendance reports. The entire process is automated, eliminating the need for manual data entry and significantly reducing human error. By automating these tasks, the system streamlines HR functions and enables quicker, more accurate reporting.

The system's modular design ensures scalability and flexibility. As organizations grow, the solution can easily be expanded to handle larger datasets and more complex attendance scenarios. The integration of **UiPath Orchestrator** allows for scheduled, automatic generation of reports at the end of each workday, enhancing operational efficiency and providing HR teams with up-to-date data for payroll and performance analysis.

The **Employee Attendance Management System** not only simplifies the task of tracking working hours but also ensures compliance with company policies and labor laws. By automating attendance validation (e.g., late entries and overtime), the system reduces the administrative burden on HR personnel and provides valuable insights into workforce productivity.

As the need for efficient attendance management systems grows in organizations, this solution proves to be reliable, scalable, and adaptable to meet future needs. The ability to generate reports quickly and accurately helps improve decision-making and enhances overall workforce management, ultimately contributing to operational efficiency and better resource utilization.

This project sets the foundation for future enhancements, including integration with other HR systems and the possibility of adding advanced features such as real-time attendance tracking and mobile-based access for employees. Through its automation capabilities, the system delivers significant time-saving benefits and ensures smooth, error-free attendance management.

APPENDICES

Appendix A: Workflow Design

This section includes the design and workflow of the Employee Attendance Management System. The steps are as follows:

1. **User Input:** The user (HR or payroll staff) provides an Excel file containing employee attendance data, including Employee ID, Name, Check-in time, and Check-out time.

2. **File Validation:** The system validates the file to ensure the correct format and checks for any missing or invalid data.

3. **Attendance Validation:** The bot checks the check-in and check-out times against the company's attendance policies (e.g., check-in after 9:00 AM marks as "Late").

4. **Overtime Calculation**: The system checks if employees are working beyond the official hours and calculates any overtime worked.

5. **Total Working Hours:** The bot calculates the total working hours in decimal format.

6. **Report Generation:** The system generates an attendance report in Excel format, detailing employee attendance status (Present, Late, Overtime) and working hours.

7. **Output:** The final report is saved to an output folder and displayed for HR or payroll processing.

Refer to the system flow diagram (Figure 1) and sequence diagram (Figure 2) in the report for detailed representations of the process.

Appendix B: Tools and Technologies Used

1. **UiPath Studio:** For designing and automating the workflow.

2. **Microsoft Excel:** For storing employee attendance data and generating reports.

3. **UiPath Orchestrator:** For automating the scheduling and management of the workflow.

4. **Excel Automation Library (UiPath.Excel.Activities):** For handling Excel file operations such as reading and writing data.

Appendix C: System Requirements

1. **Software:**

   - UiPath Studio (Version 2024.10 or above)

   - Microsoft Excel 2016 or above

   - UiPath Orchestrator (if needed for automation scheduling)

2. **Hardware:**

   - **Processor:** Intel i3 or above

   - **RAM**: 4 GB minimum

   - **Disk Space:** 500 MB for tools and dependencies

Appendix D: UiPath Workflow (XAML File)

This appendix includes the main UiPath workflow used for the Employee Attendance Management System.

- **Main.xaml:** The primary workflow file that reads employee data, validates times, calculates working hours, and generates reports.

Appendix E: Example Input and Output

1. **Input:**

   - **Excel file path:** "C:\Users\bhuva\OneDrive\Desktop\RPA Project\Attendance Info.xlsx"

   - **Employee Data:** The Excel file includes columns like Employee ID, Name, Check-in time, Check-out time.

2. **Intermediate Files:**

   - **Processed Attendance Data:** The system processes the input file to validate check-in/check-out times and calculate total working hours.

3. **Output:**

   - **Generated Report:** attendance_report.xlsx

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