Robotic Process Automation

Project Report

Automating ID Card Generation Process Using UiPath Studio

Abstract

This report delves into the automation of the ID card generation process using UiPath Studio, one of the foremost platforms in Robotic Process Automation (RPA). The primary objective of this project is to address the shortcomings of the conventional manual approach to creating ID cards, which is frequently prone to inefficiencies, human errors, and time-consuming processes. By transitioning to an automated system, the project aims to significantly enhance accuracy, reduce processing times, and minimize operational costs.

The automated workflow designed within UiPath Studio incorporates several key functionalities. These include the extraction of employee or student data from Excel spreadsheets, which ensures seamless data input into the ID card generation process. Additionally, the system incorporates photo verification features that validate and match the correct photos with the corresponding individual data. Once the data and images are verified, the automation proceeds to generate personalized ID cards in PDF format, ready for distribution. To further optimize the process, the automation includes an integrated email module that automatically sends the generated ID cards to the respective individuals or departments, thereby eliminating the need for manual intervention.

This report outlines the project's objectives in detail, focusing on the need for improved accuracy, time efficiency, and resource optimization. It also presents the proposed solutions, highlighting the various automation techniques employed to ensure smooth, error-free ID card generation. The system design section provides a comprehensive overview of the workflow, including data input methods, validation checkpoints, PDF generation, and email automation. Furthermore, the report specifies the necessary software and hardware requirements for implementing this solution, including UiPath Studio, Excel, Adobe Acrobat, and SMTP servers for email distribution.

Contents

Chapter 1: Introduction

The generation of ID cards is a critical function across various sectors, including businesses, educational institutions, and governmental organizations. Traditionally, the process has involved manual data entry, the collection of employee photographs, and subsequent design and distribution of ID cards. This manual approach not only consumes a significant amount of time but is also susceptible to errors—ranging from incorrect data entries to misplaced photographs. Consequently, there is a pressing need for a more efficient and reliable solution.

1.1 Objective

The primary objective of this project is to automate the ID card generation process utilizing UiPath Studio. The automation aims to streamline each step of the workflow, which includes reading employee data from an Excel spreadsheet, verifying the existence of associated photographs, generating ID card PDFs, and automatically sending these cards via email. By achieving these objectives, the project seeks to minimize human error, enhance the speed of processing, and ensure consistent formatting in ID card designs.

1.2 Proposed Solution

The proposed solution entails developing a comprehensive automation workflow in UiPath that encompasses multiple stages. Initially, the bot retrieves credentials for accessing necessary systems and opens the Excel file containing employee information. It then iterates through each row of data, checks for any missing information, and verifies the existence of employee photos. Upon successful validation, the bot generates a PDF for each ID card, integrating the appropriate employee data and photographs. Finally, the bot sends the generated ID cards via email to the respective employees, thereby automating the entire process from data entry to distribution.

Chapter 2: System Design

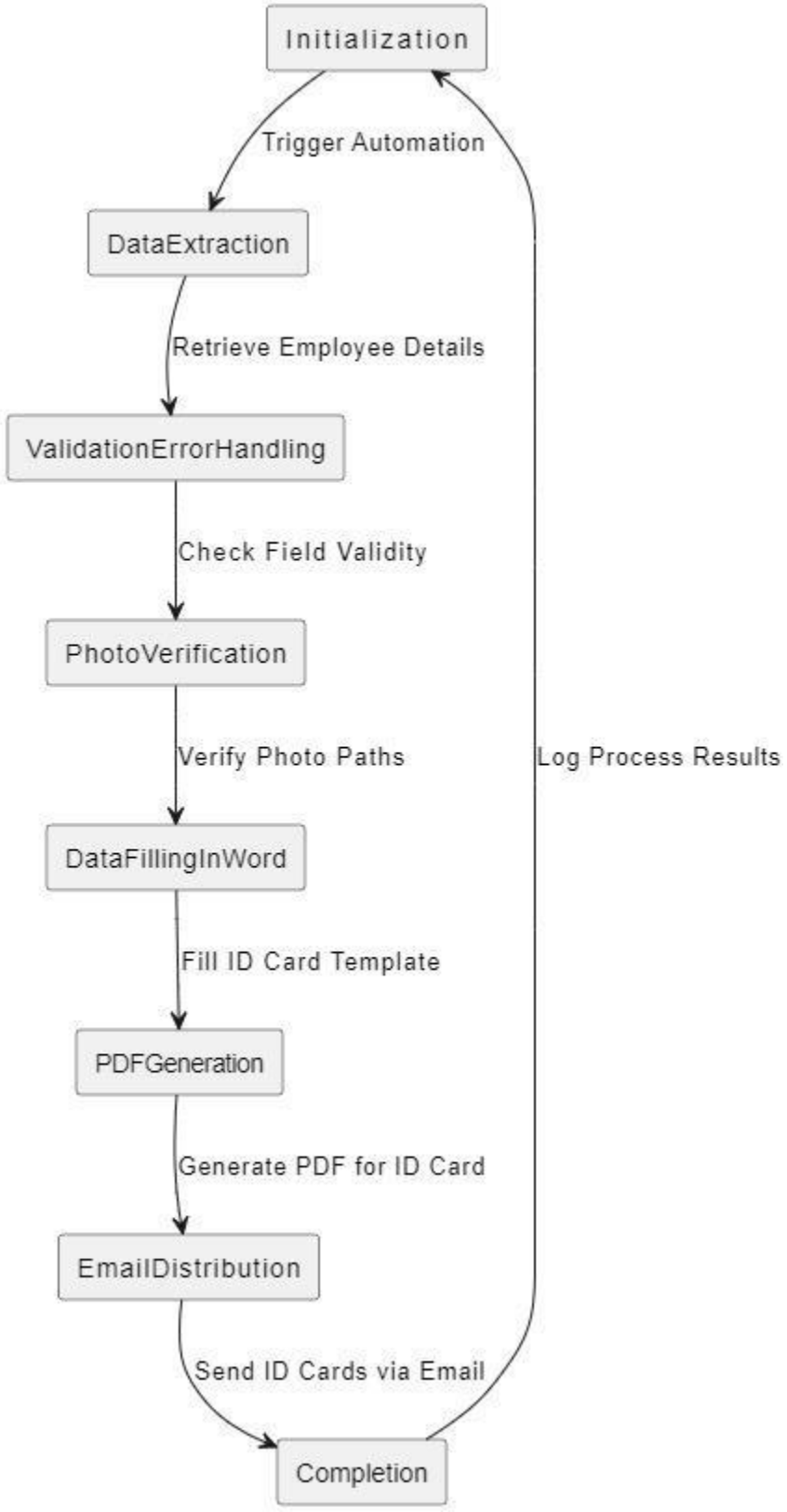
The system design forms the backbone of the ID card automation project, detailing how different components interact to accomplish the generation of ID cards through Robotic Process Automation (RPA). A well-conceived design is crucial for ensuring that each part of the process integrates seamlessly, leading to a streamlined, efficient workflow that eliminates human error and reduces time consumption. This chapter delves into the structural aspects of the system, including a block diagram, flowchart, and software requirements, each of which contributes to the overall functionality and success of the automation.

2.1 Block Diagram

The block diagram visually represents the architecture of the automation system, displaying the various components involved in each stage of the ID card generation process. It highlights the sequential steps and interaction points between key elements:

- **Data Input Stage**: The process begins with an Excel file containing relevant employee or student data, such as names, employee IDs, departments, and photo references. This file serves as the primary data source for the automation bot.
- **Processing Units**: The next phase involves several key operations:
    - **Data Validation**: Ensures that all required fields (such as names, ID numbers, and photo paths) are present and formatted correctly. Missing or incorrect information is flagged for manual review.
    - **Photo Verification**: The bot cross-references the photo paths in the Excel file with the actual file locations to ensure each ID card will be paired with the correct photo.
- **PDF Generation**: After the data is validated and the photos are verified, the system generates ID cards in PDF format using predefined templates. Each PDF contains the individual's name, ID number, department, and photo in a neatly designed layout.
- **Email Distribution**: In the final stage, the bot automatically attaches the generated PDFs to emails and sends them to the respective recipients, completing the process without any manual intervention.

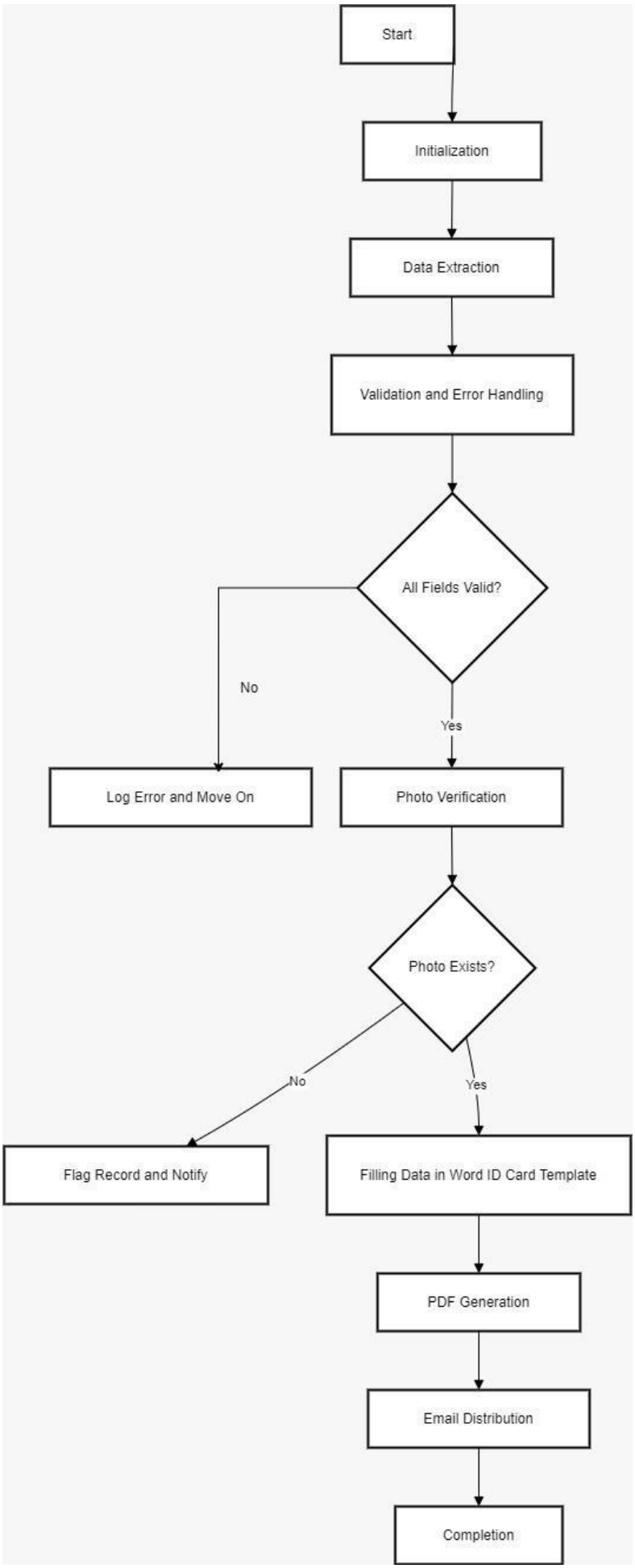
Each block represents a distinct function within the system, allowing for the smooth flow of data from the input stage to the final output.



2.2 Flowchart

The flowchart complements the block diagram by providing a more detailed, step-by-step representation of the entire automation workflow. It breaks down the automation process into a series of logical operations and decision points, ensuring a clear understanding of how the system operates under different conditions.

- **Initialization**: The bot is triggered, and the automation process begins by loading the necessary components, including the Excel file and other resources.
- **Data Extraction**: The bot reads each row from the Excel file, retrieving employee details such as name, ID, and photo path.
- **Validation and Error Handling**: Decision points in the flowchart check whether all fields are populated and correctly formatted. If any field is missing or incorrect, the bot logs the error and moves on to the next record, or it may halt the process depending on the configuration.
- **Photo Verification**: The bot verifies that the photo paths correspond to actual image files. If a photo is missing, the bot flags the record and may send a notification for manual correction.
- **PDF Generation**: Once the data is validated and photo verification is successful, the bot generates a personalized ID card in PDF format for each individual.
- **Email Distribution**: After the PDFs are generated, the bot attaches them to pre-configured email templates and sends the ID cards to the intended recipients.
- **Completion**: The bot logs the process results, including errors and successful email deliveries, before shutting down.


Start
Initialization
Data Extraction
Validation and Error Handling
All Fields Valid?
No
Yes
Log Error and Move On
Photo Verification
Photo Exists?
No
Yes
Flag Record and Notify
Filling Data in Word ID Card Template
PDF Generation
Email Distribution
Completion

2.3 Software Requirements

To effectively implement this automation system, a combination of software tools and libraries is required to manage data, generate ID cards, and automate email distribution:

- **UiPath Studio**: This is the core platform where the automation workflows are designed and executed. UiPath Studio provides the visual interface and development environment for creating sequences, integrating components, and handling exceptions.
- **Microsoft Excel**: Excel serves as the data source, housing the employee or student information in a structured format. UiPath interacts with Excel to extract the necessary details for ID card generation.
- **PDF Generation Libraries**: These libraries allow for the creation of professional ID cards in PDF format. The templates used for the ID cards can be customized to include fields like name, ID number, department, and a photo placeholder, ensuring that each ID is generated with consistent formatting.
- **SMTP Server**: A Simple Mail Transfer Protocol (SMTP) server is required to automate email sending. The SMTP server facilitates the delivery of emails with the generated PDFs as attachments, ensuring timely and accurate distribution to the respective individuals.
- **File System for Photos**: A file system where the employee or student photos are stored and accessible by the bot is essential for photo verification and inclusion in the ID card PDFs.

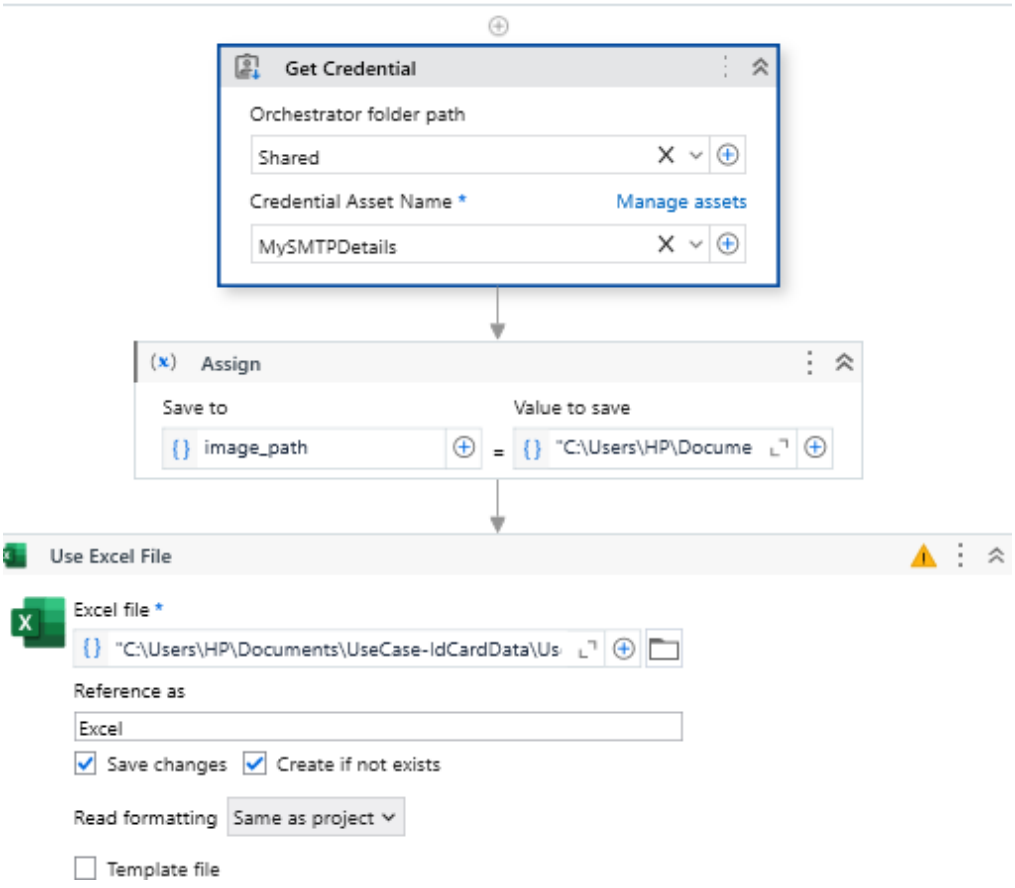
Together, these software components work in harmony to form a fully automated ID card generation system. The integration of data extraction, validation, PDF creation, and email distribution ensures a smooth, end-to-end process that enhances organizational efficiency while minimizing errors associated with manual ID card creation. This holistic design also allows for future scalability and customization, as additional features or requirements can be integrated into the existing framework.

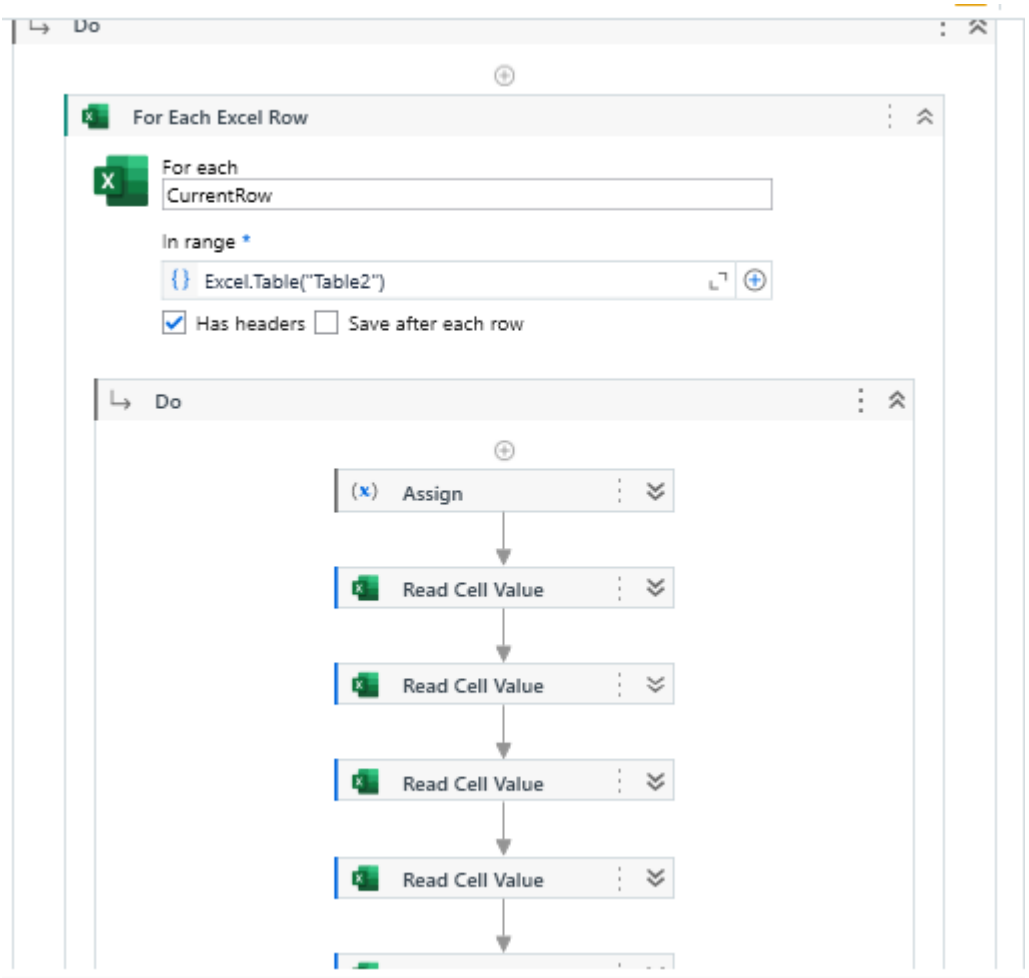
Chapter 3: Implementation

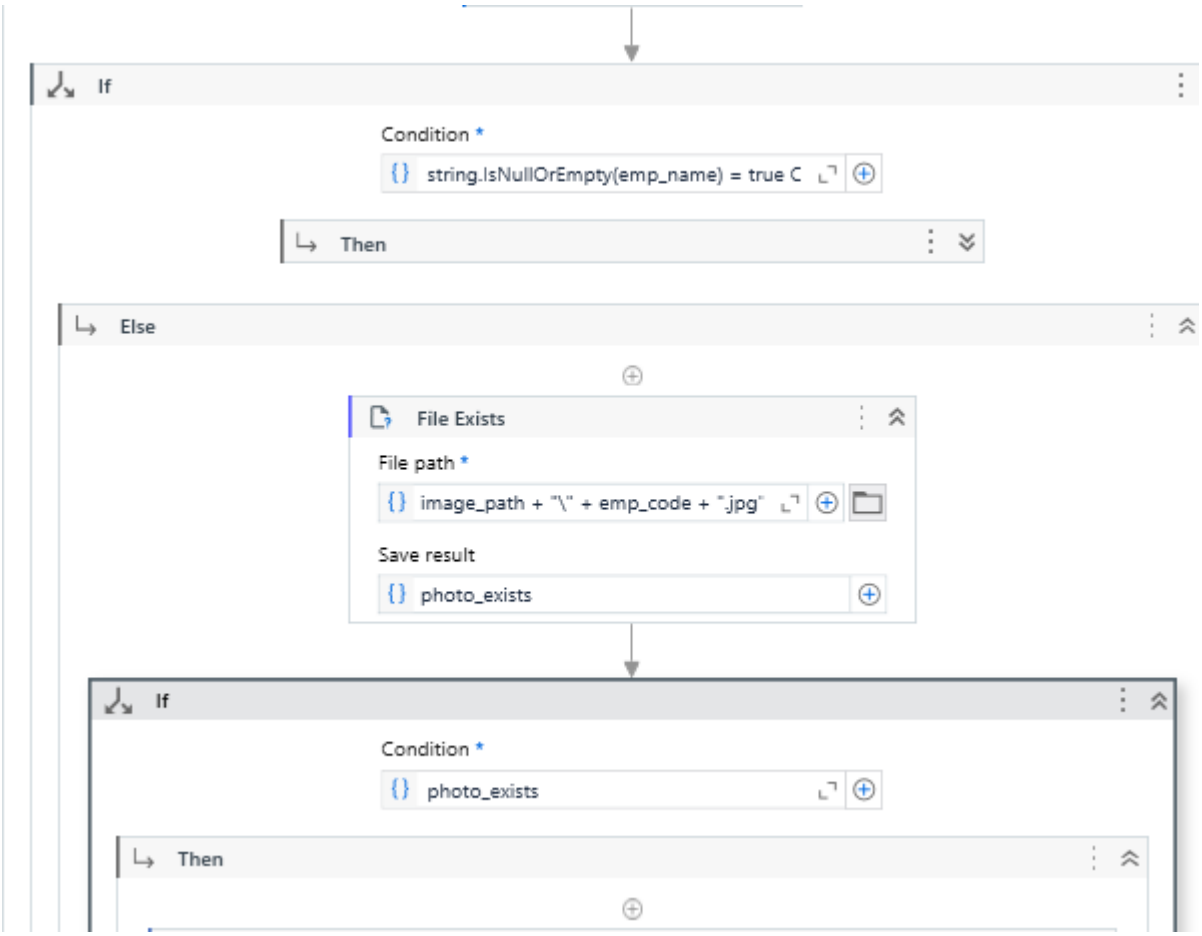
The implementation strategy involved setting up the development environment in UiPath Studio and developing the automation workflows. The development process included using the "Read Range" activity to import employee data from the Excel file and implementing a "For Each Row" loop to iterate through the dataset. Integration of validation checks for missing information and file existence ensured robustness in the workflow.

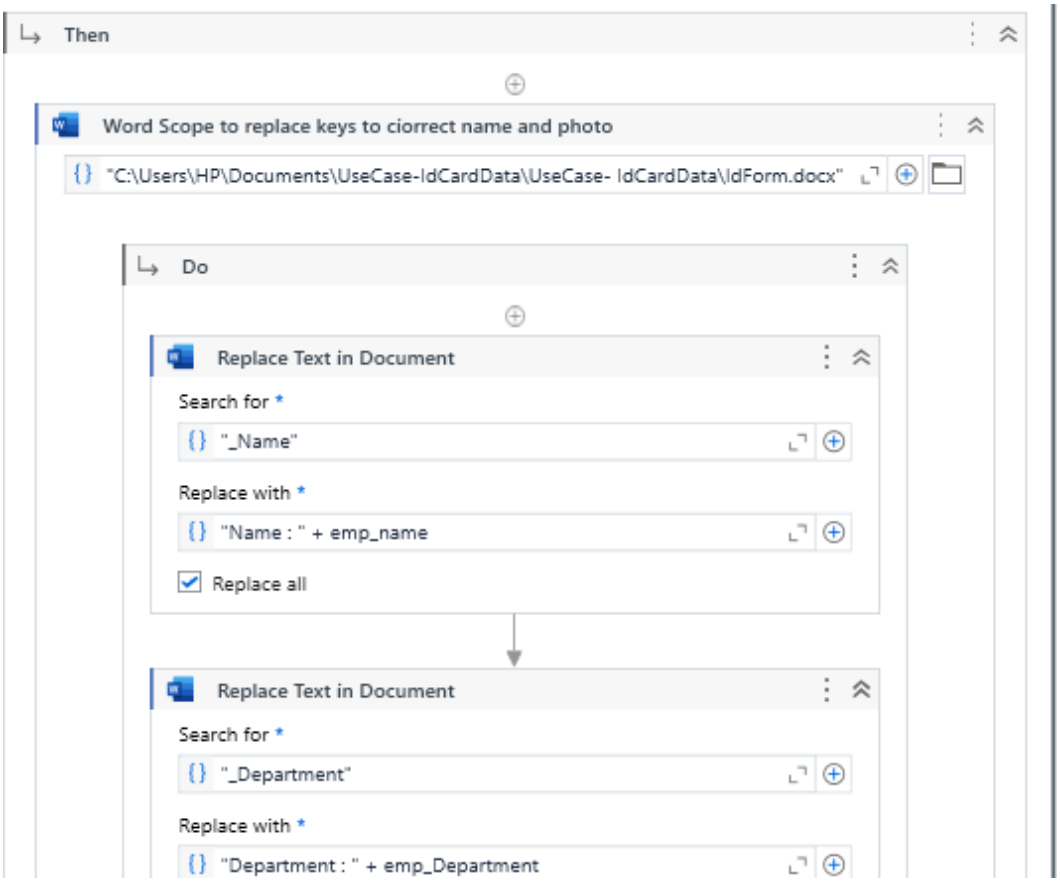
After developing the workflows, a comprehensive testing strategy was employed, which involved unit testing each component and conducting integration tests to assess the overall functionality of the automated process. Test cases were crafted to cover various scenarios, such as successful data processing, handling missing photographs, and validating email delivery with attachments.

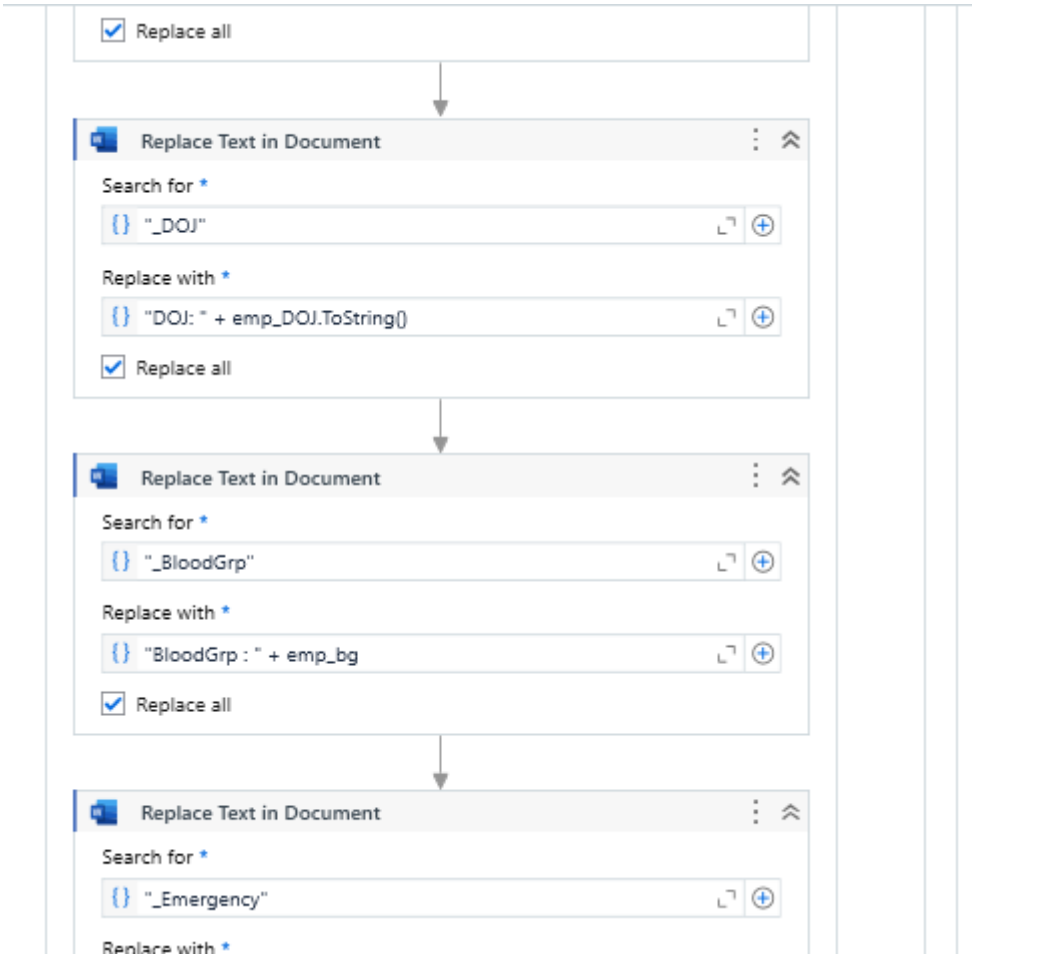
3.1 Implementation Snaps

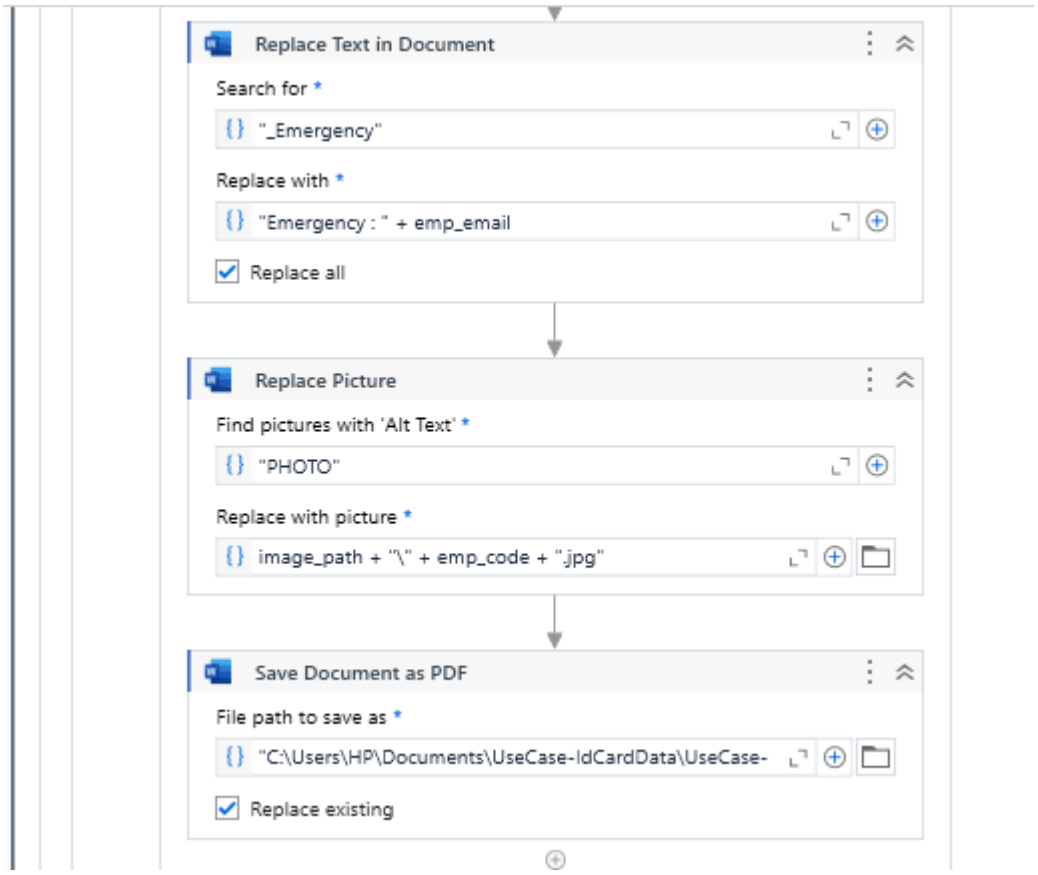


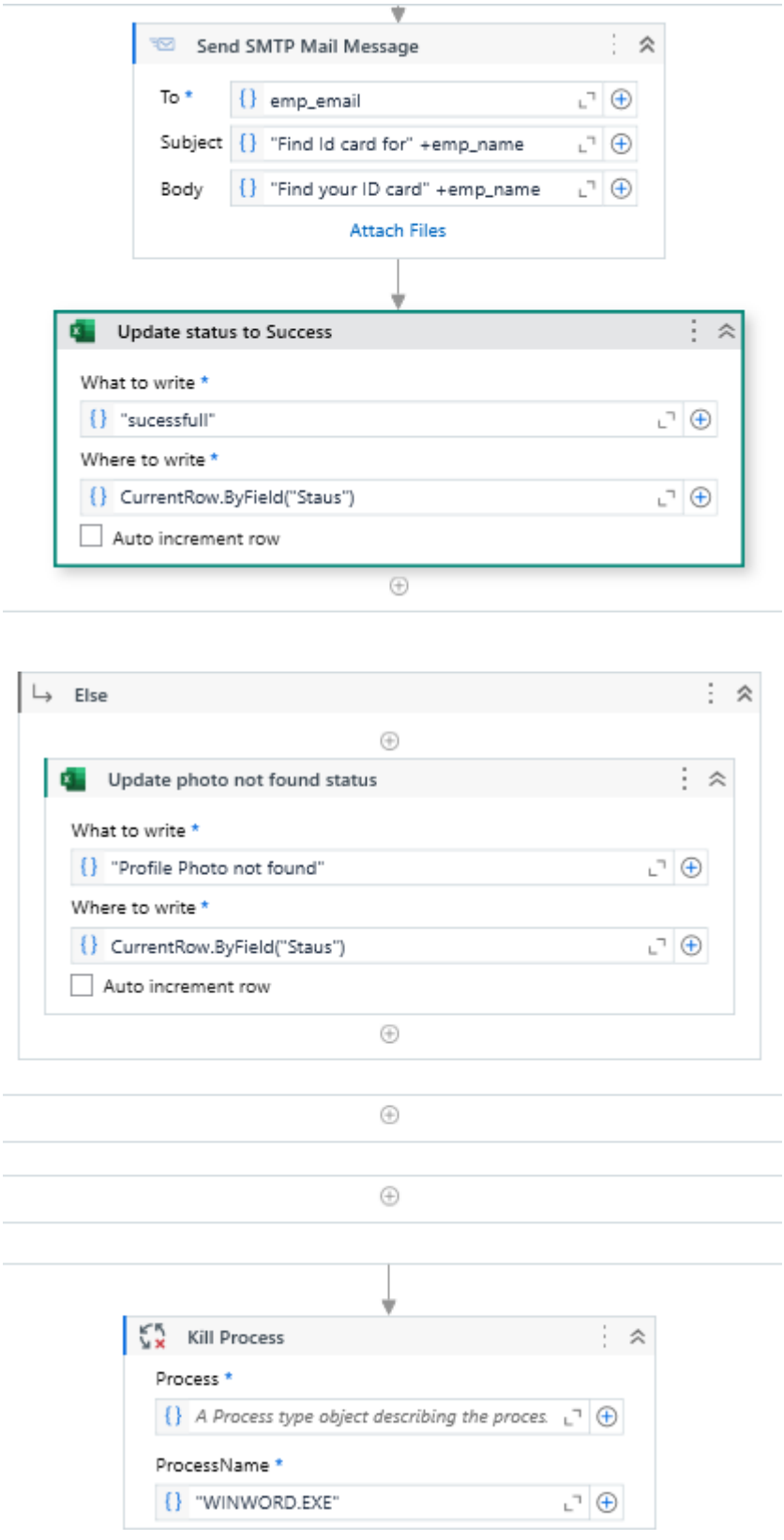

Do
For Each Excel Row
For each
CurrentRow
In range *
Excel.Table("Table2")
Has headers
Save after each row
Do
Assign
Read Cell Value
Read Cell Value
Read Cell Value
Read Cell Value


If
Condition *
string.IsNullOrEmpty(emp_name) = true C
Then
Else
File Exists
File path *
image_path + "\" + emp_code + ".jpg"
Save result
photo_exists
If
Condition *
photo_exists
Then


Then
Word Scope to replace keys to ciorrect name and photo
"C:\Users\HP\Documents\UseCase-IdCardData\UseCase- IdCardData\IdForm.docx"
Do
Replace Text in Document
Search for *
"_Name"
Replace with *
"Name : " + emp_name
Replace all
Replace Text in Document
Search for *
"_Department"
Replace with *
"Department : " + emp_Department


Replace all
Replace Text in Document
Search for *
"_DOJ"
Replace with *
"DOJ: " + emp_DOJ.ToString()
Replace all
Replace Text in Document
Search for *
"_BloodGrp"
Replace with *
"BloodGrp : " + emp_bg
Replace all
Replace Text in Document
Search for *
"_Emergency"
Replace with *


Replace Text in Document
Search for *
"_Emergency"
Replace with *
"Emergency : " + emp_email
Replace all
Replace Picture
Find pictures with 'Alt Text' *
"PHOTO"
Replace with picture *
image_path + "\" + emp_code + ".jpg"
Save Document as PDF
File path to save as *
"C:\Users\HP\Documents\UseCase-IdCardData\UseCase-
Replace existing

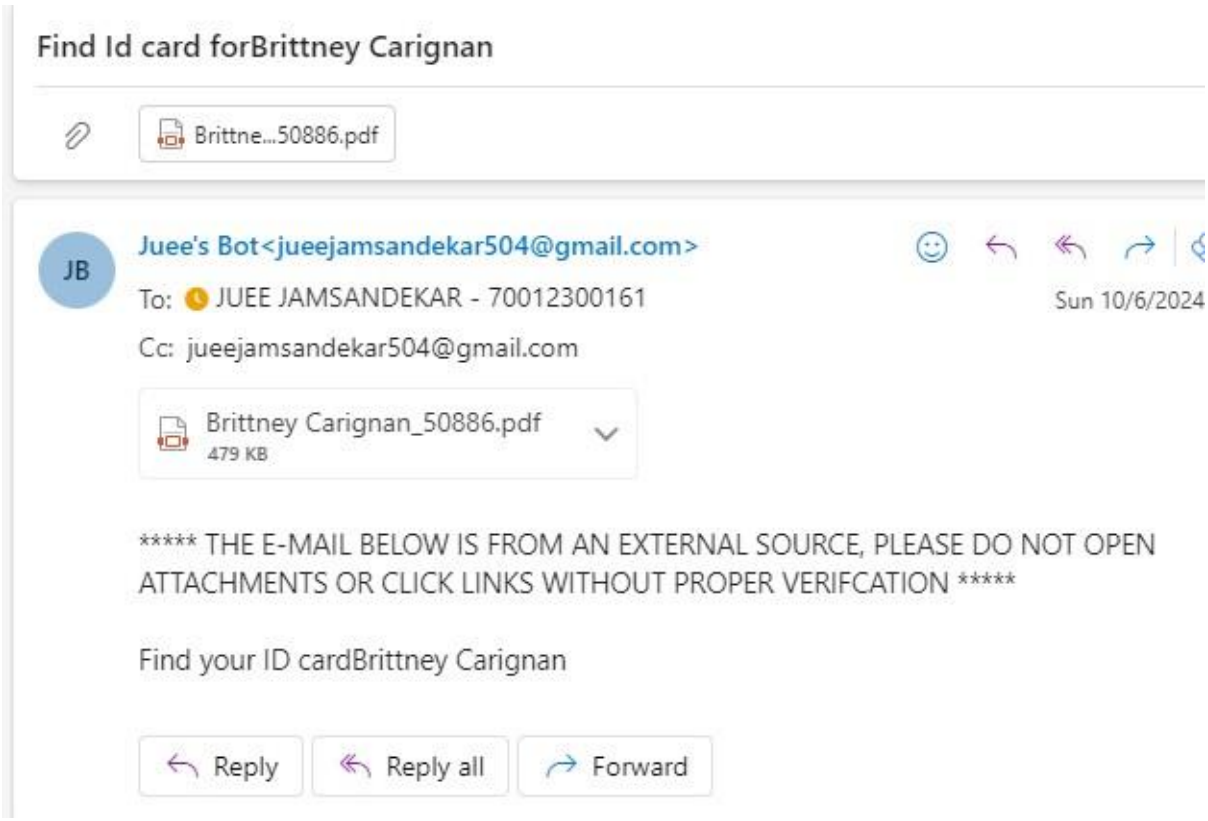

Send SMTP Mail Message
To *
emp_email
Subject
"Find Id card for" +emp_name
Body
"Find your ID card" +emp_name
Attach Files
Update status to Success
What to write *
"sucessfull"
Where to write *
CurrentRow.ByField("Staus")
Auto increment row
Else
Update photo not found status
What to write *
"Profile Photo not found"
Where to write *
CurrentRow.ByField("Staus")
Auto increment row
Kill Process
Process *
A Process type object describing the proces
ProcessName *
"WINWORD.EXE"

No	Name	Department	EmpCode	DOJ	BloodGroup	EmailID	Staus
1	Brittney Carignan	Human Resource	50886	12-Feb-22	O +ve	juee.jamsandek	sucessfull
2	William Middlebrooks	Purchase	28438	12-Feb-22	A +ve	harini.suryanara	sucessfull
3	Sarah Neighbors	Purchase	22137		B +ve	anjanimalladi.s	missing feild(s): doj,
4	Henry Hunter	Marketing	23915	15-Feb-22	O +ve	md.ismaaiil@gr	sucessfull
5	Daniel Padillo	Finance	39636	16-Mar-22	AB +ve	abc@gmail.con	sucessfull
6	Sharon Becerra	Finance	67564	17-Feb-22	O +ve	xyz@gmail.con	sucessfull
7	Leah Gibbs	Human Resource			O +ve	abc@gmail.con	missing feild(s): empc, doj,
8	Rosie Pica	Finance	84162	19-Jan-22	A -ve	xyz@gmail.con	sucessfull
9	Robert Conner	Marketing	46141	20-Feb-22	O -ve	abc@gmail.con	sucessfull
10	Angelia Cartee	Sales	94396	21-Feb-22	AB -ve	xyz@gmail.con	sucessfull
11	Marie Burgess	Marketing	56066	02-Mar-22	O +ve	abc@gmail.con	sucessfull
12	Clara Smith	Human Resource	95185	23-Feb-22	AB +ve	xyz@gmail.con	Profile Photo not found
13	Sidney J. Norman	Human Resource		24-Feb-22	O +ve	abc@gmail.con	missing feild(s): empc,
14	Wayne K. Hicks	Finance	1	25-Feb-22	A +ve	xyz@gmail.con	Profile Photo not found
15	Rudy McDade	Marketing	13457		B +ve	abc@gmail.con	missing feild(s): doj,
16	Sheila Dever	Human Resource	66089	10-Feb-22	O +ve	xyz@gmail.con	sucessfull
17							missing feild(s): name, empc, doj, bg, depart, email,

Id card files generated by bot

William Middlebrooks_28438.pdf	06-10-2024 15:01	Adobe Acrobat D...
Sheila Dever_66089.pdf	06-10-2024 15:03	Adobe Acrobat D...
Sharon Becerra_67564.pdf	06-10-2024 15:02	Adobe Acrobat D...
Rosie Pica_84162.pdf	06-10-2024 15:02	Adobe Acrobat D...
Robert Conner_46141.pdf	06-10-2024 15:03	Adobe Acrobat D...
Marie Burgess_56066.pdf	06-10-2024 15:03	Adobe Acrobat D...
Henry Hunter_23915.pdf	06-10-2024 15:01	Adobe Acrobat D...
Daniel Padillo_39636.pdf	06-10-2024 15:02	Adobe Acrobat D...
Brittney Carignan_50886.pdf	06-10-2024 15:01	Adobe Acrobat D...
Angelia Cartee_94396.pdf	06-10-2024 15:03	Adobe Acrobat D...

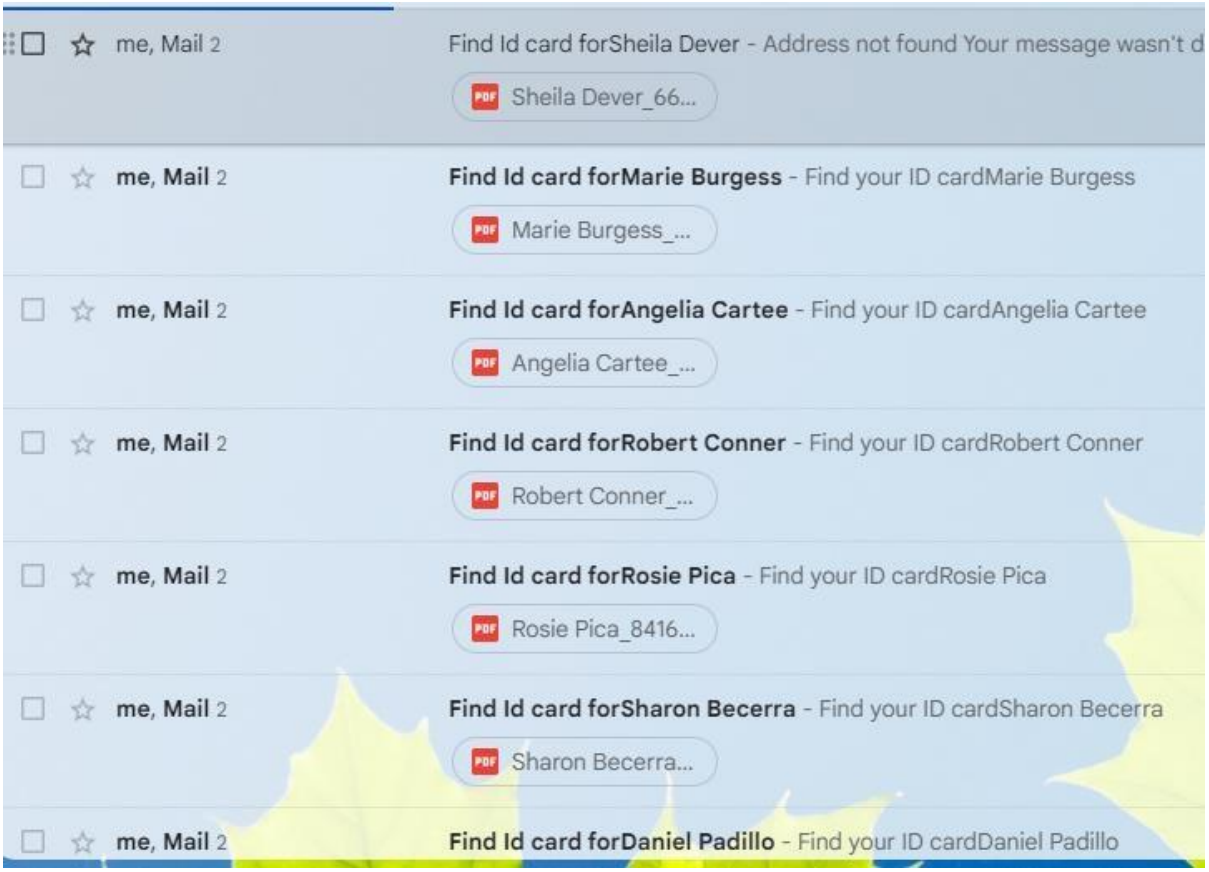
outlook

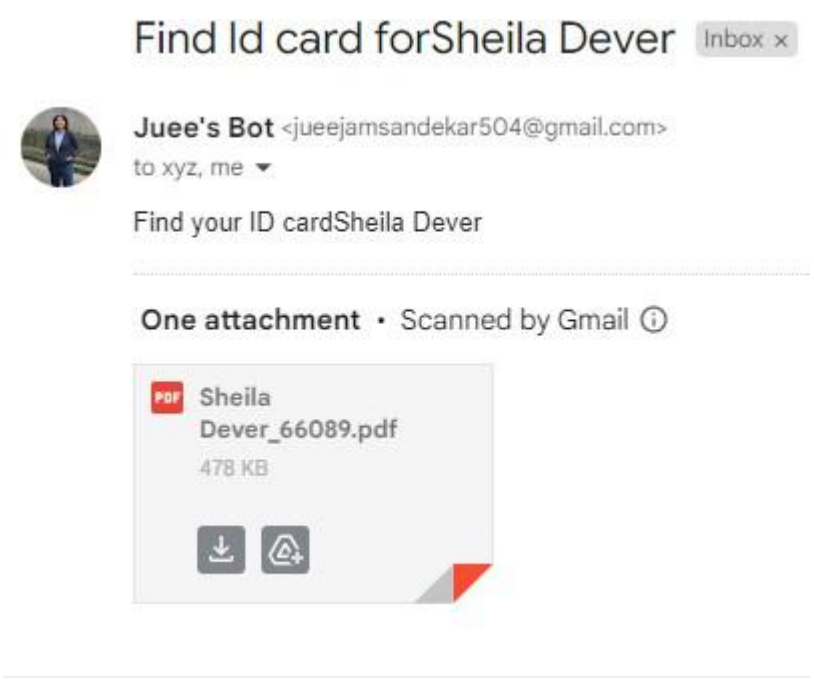

Find Id card forBrittney Carignan
Brittne...50886.pdf
JB
Juee's Bot<jueejamsandekar504@gmail.com>
To: JUEE JAMSANDEKAR - 70012300161
Sun 10/6/2024
Cc: jueejamsandekar504@gmail.com
Brittney Carignan_50886.pdf
479 KB
***** THE E-MAIL BELOW IS FROM AN EXTERNAL SOURCE, PLEASE DO NOT OPEN ATTACHMENTS OR CLICK LINKS WITHOUT PROPER VERIFCATION *****
Find your ID cardBrittney Carignan
Reply
Reply all
Forward

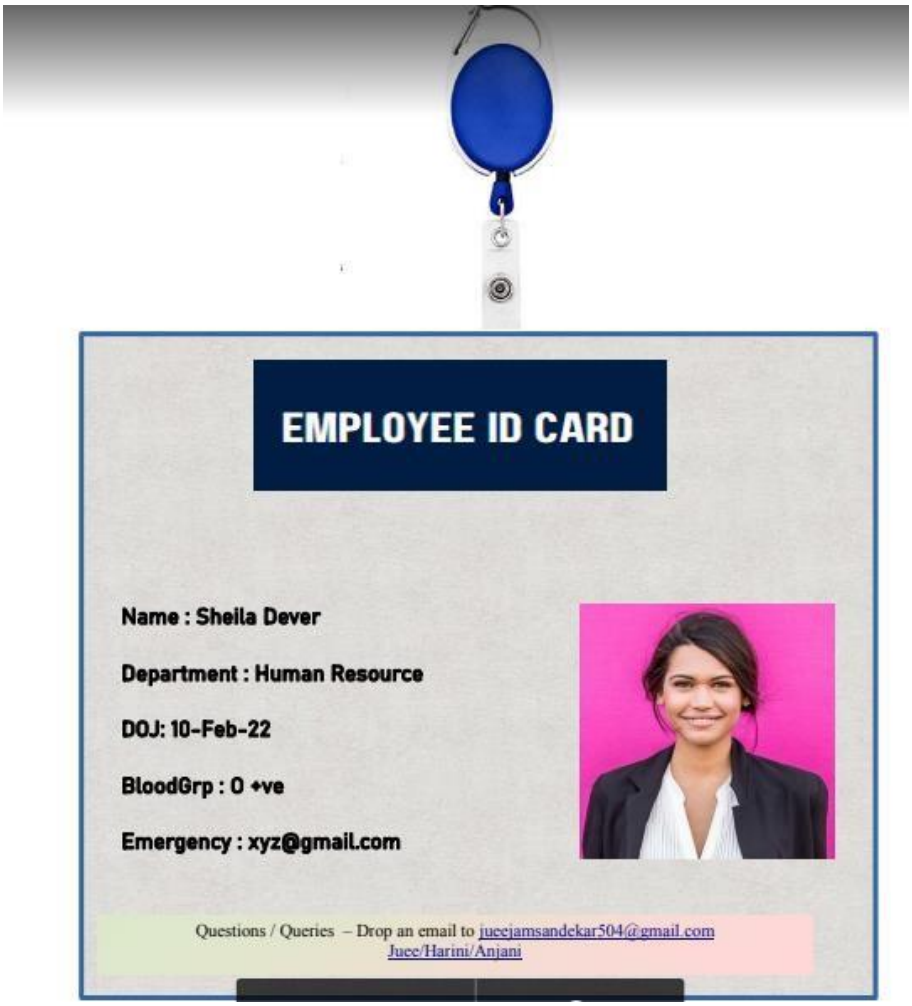
Brittney Carignan_50886.pdf Download Print Save to OneDrive

[redacted]

Gamil


me, Mail 2
Find Id card forSheila Dever - Address not found Your message wasn't d
Sheila Dever_66...
me, Mail 2
Find Id card forMarie Burgess - Find your ID cardMarie Burgess
Marie Burgess_...
me, Mail 2
Find Id card forAngelia Cartee - Find your ID cardAngelia Cartee
Angelia Cartee_...
me, Mail 2
Find Id card forRobert Conner - Find your ID cardRobert Conner
Robert Conner_...
me, Mail 2
Find Id card forRosie Pica - Find your ID cardRosie Pica
Rosie Pica_8416...
me, Mail 2
Find Id card forSharon Becerra - Find your ID cardSharon Becerra
Sharon Becerra...
me, Mail 2
Find Id card forDaniel Padillo - Find your ID cardDaniel Padillo


Find Id card forSheila Dever
Inbox ×
Juee's Bot <jueejamsandekar504@gmail.com>
to xyz, me
Find your ID cardSheila Dever
One attachment • Scanned by Gmail
Sheila Dever_66089.pdf
478 KB


EMPLOYEE ID CARD
Name : Sheila Dever
Department : Human Resource
DOJ: 10-Feb-22
BloodGrp : O +ve
Emergency : xyz@gmail.com
Questions / Queries – Drop an email to jueejamsandekar504@gmail.com
Juee/Harini/Anjani

Chapter 4: Conclusion

Benefits and Impact Analysis

The anticipated benefits of automating the ID card generation process are substantial. Firstly, efficiency improvements are expected to be significant, with processing times drastically reduced compared to manual methods. The accuracy of ID cards will be enhanced, as data will be pulled directly from structured sources, thereby minimizing errors associated with manual entry. Furthermore, the consistency in ID card design will be maintained, ensuring that all ID cards meet organizational standards.

The automated system also improves communication by automatically sending ID cards to employees or students, which saves time for HR personnel and ensures that recipients receive their cards promptly. Overall, the automation project not only optimizes the ID card creation process but also positively impacts user satisfaction and operational effectiveness.

Challenges and Mitigation Strategies

Throughout the project, several challenges were identified, particularly concerning data accuracy and photo file management. To mitigate these risks, robust validation checks were integrated into the workflow to catch any missing information at the outset. The system also includes error handling mechanisms that log issues and provide clear notifications to users, ensuring that any problems are addressed quickly and efficiently.

Future Enhancements

Looking ahead, there are several opportunities for future enhancements to this automation project. One potential improvement is the integration of the ID card generation system with other Human Resource Management Systems (HRMS) to enable real-time data updates and further streamline the process. Additionally, developing a user-friendly interface for manual overrides or adjustments could enhance flexibility, allowing HR personnel to intervene in cases where exceptions occur. Finally, expanding the functionality to include features such as badge printing and renewal reminders could provide even greater value to the organization.

Conclusion

In conclusion, the automation of the ID card generation process using UiPath Studio represents a significant advancement in operational efficiency for organizations. By transitioning from a manual, error-prone system to an automated workflow, the project not only addresses existing challenges but also lays the groundwork for future enhancements. The proposed solution enhances accuracy, ensures timely delivery, and allows HR personnel to allocate their efforts toward more strategic tasks rather than administrative ones. As organizations continue to seek improvements in their operational processes, this automation project serves as a compelling example of how technology can drive efficiency and effectiveness in essential functions like ID card management. Future iterations of the project could explore further integrations with HR systems, real-time data updates, and even advanced features like mobile notifications, thereby enhancing its utility and impact.

Chapter 5 : References

- https://forum.uipath.com/t/uipath-documentation/16123/2
- https://www.uipath.com/kb-articles/outlook-email-automation
- https://www.uipath.com/kb-articles
- https://docs.uipath.com/studio/standalone/2023.10/user-guide/ui-automation