Introduction to Robotic Process Automation

APP REVIEW SENTIMENT ANALYSIS BOT

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Abstract

The "App Review Sentiment Analysis Project" is an Intelligent Robotic Process Automation (IRPA) initiative that automates the scraping and analysis of app feedback from the Play Store to generate structured Excel reports. Utilizing UiPath's Robotic Enterprise (RE) Framework and AI Center, the project minimizes human error and intervention by systematically extracting review data, including posting dates and helpful votes, and storing the results in a designated Excel sheet. Key features include table extraction, Excel generation, and seamless robot communication through AI Center, ensuring a reliable end-to-end workflow. The RE Framework enhances scalability, exception handling, and process consistency, making the solution adaptable for future improvements. This automation significantly reduces the time spent on review analysis, allowing professionals to concentrate on strategic tasks, thereby improving operational efficiency and establishing a standard for optimizing repetitive processes.

Need for the Proposed System

1. **Enhanced Efficiency:** The proposed system automates the feedback analysis process, significantly reducing the time and effort required to scrape and review app feedback, allowing professionals to focus on strategic tasks.
2. **Structured Data Management**: By generating structured Excel reports from scraped data, the system ensures organized and easily accessible information that can be utilized for further analysis and decision-making.
3. **Robust Error Handling:** Utilizing UiPath's RE Framework, the system incorporates built-in error handling and logging mechanisms, ensuring reliability and minimizing disruptions during the automation process.
4. **Scalability:** The framework allows for easy scaling of automation processes, accommodating growing business needs without significant reconfiguration, making it adaptable for future enhancements.

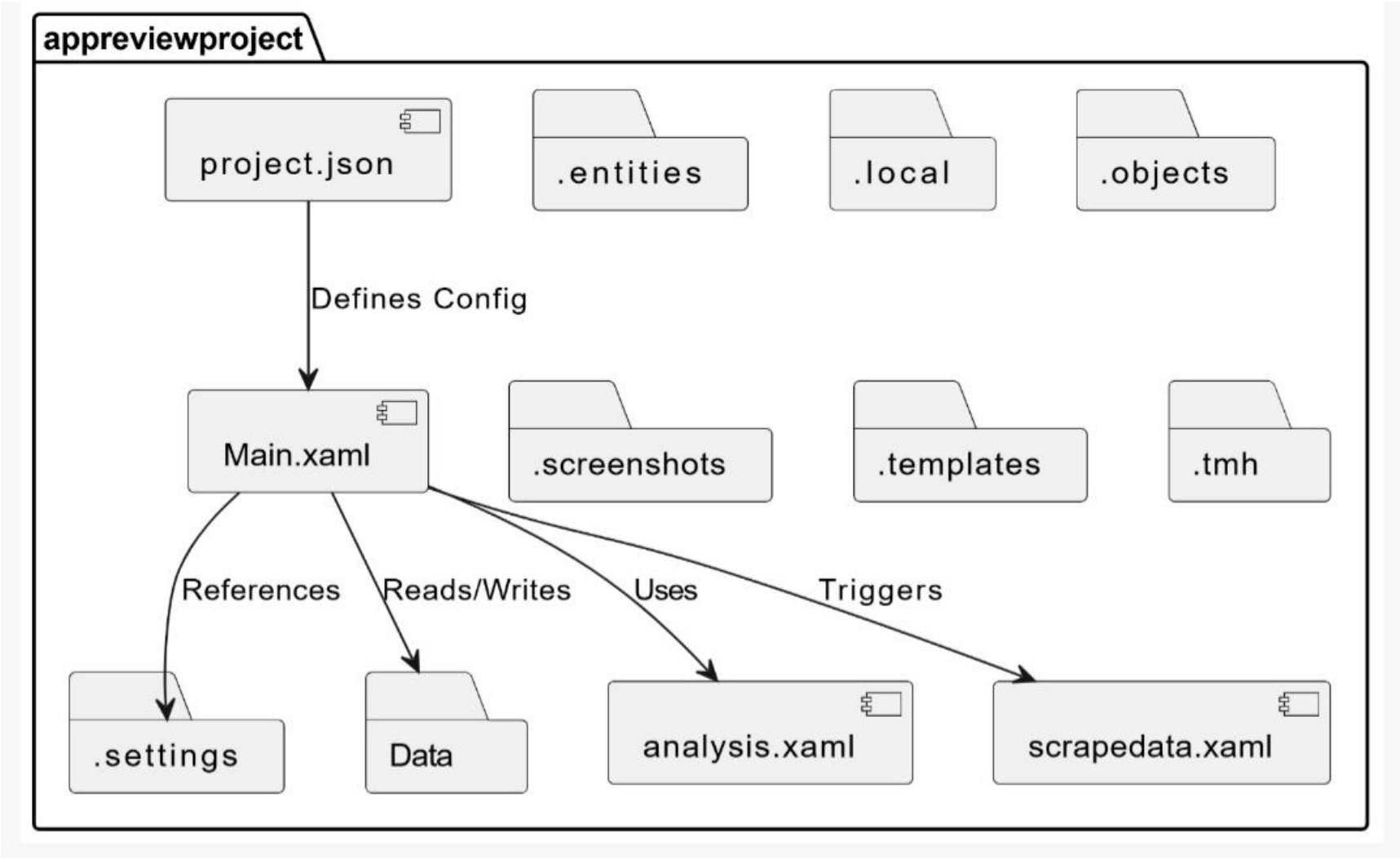
Advantages of the Proposed System

- **Increased Efficiency:** Automates feedback analysis, saving time and effort for strategic tasks.
- **Higher Accuracy:** Reduces human errors in data scraping and analysis, ensuring reliable insights.
- **Scalable Solution:** Easily adapts to growing feedback volumes without extensive reconfiguration.
- **Organized Reporting:** Generates structured Excel reports for better data management and decision-making.

Main Objective

The main objective of the "App Review Sentiment Analysis Project" is to automate the process of scraping and analyzing app feedback from the Play Store, transforming unstructured data into structured Excel reports. By leveraging UiPath's Intelligent Robotic Process Automation (IRPA) capabilities, the project aims to enhance operational efficiency, reduce human error, and provide actionable insights that enable professionals to focus on strategic decision-making. Ultimately, the project seeks to optimize the review analysis process, making it more reliable and scalable for future needs.

Architecture



System Requirements

- Software:

1. UiPath Studio: Latest version for automation development.
2. .NET Framework: Version 4.6 or higher for compatibility.
3. Microsoft Excel: Optional for report management.
4. Web Browsers: Google Chrome or Microsoft Edge with extensions.

- Hardware:

1. Operating System: Windows 10 or later.
2. Processor: Multi-core for efficient processing.
3. RAM: Minimum 4 GB; 8 GB recommended.
4. Disk Space: At least 1 GB for installation and projects.

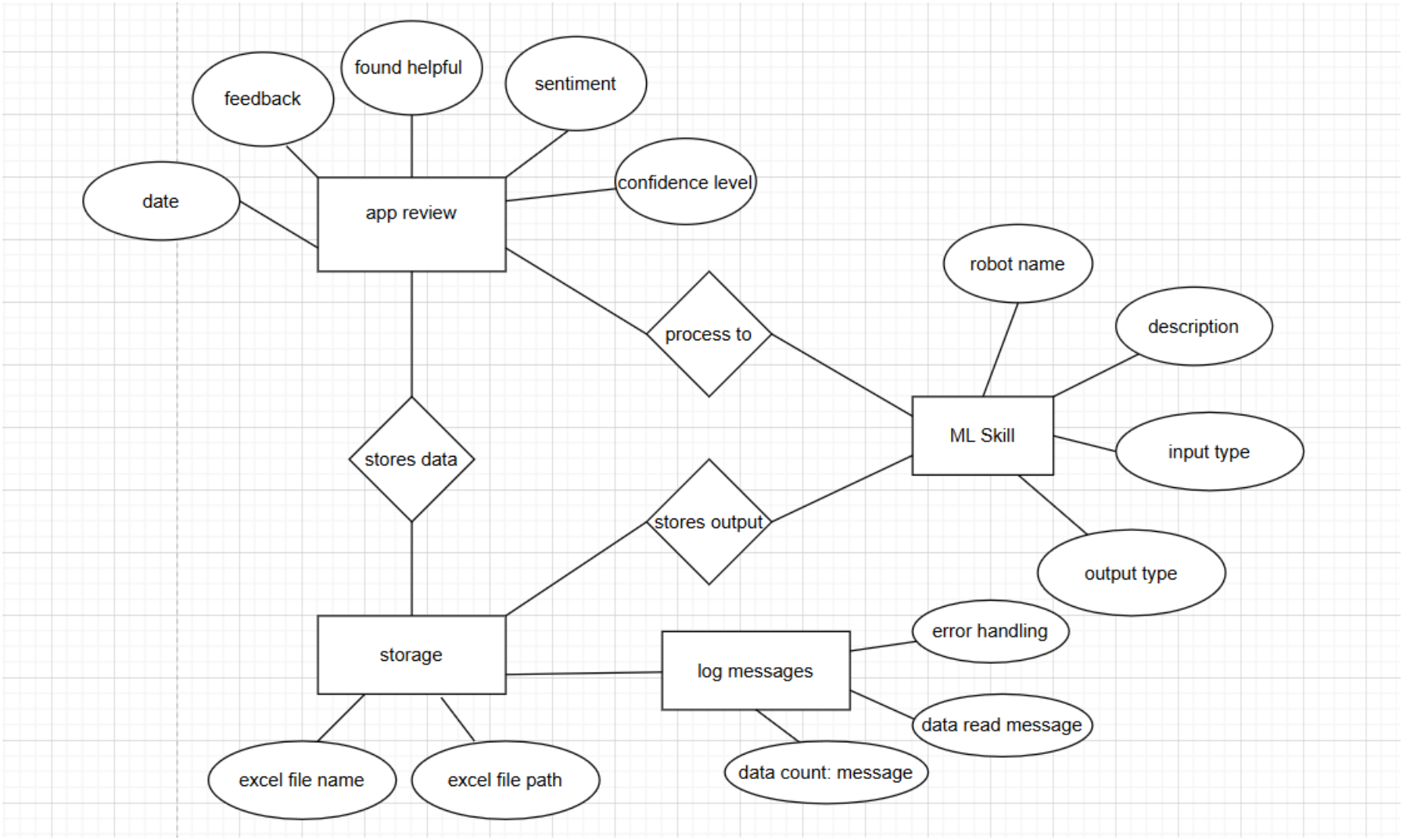
Functional Description

- **Data Initialization:** The process begins by reading configuration settings and initializing necessary applications. This includes setting up connections to the Play Store and preparing the environment for data extraction.
- **Data Scraping:** The system automatically scrapes app reviews, including details such as review text, posting dates, and helpful votes. This data is collected in real-time to ensure that the analysis reflects the most current user feedback.
- **Data Processing:** Once the reviews are scraped, the project analyzes sentiment by categorizing feedback into positive, negative, or neutral sentiments. This analysis helps in understanding user perceptions and identifying areas for improvement.

Functional Description

- **Excel Report Generation:** The processed data is then structured and stored in an Excel sheet, allowing for easy access and further analysis. This report includes key metrics and insights derived from the sentiment analysis.
- **Error Handling and Logging:** Throughout the automation process, robust error handling mechanisms are in place to manage exceptions and log errors for troubleshooting. This ensures that any issues can be quickly identified and resolved.

Table Design



Process Design

- Main Process

1. **Initialization:** Set up the environment by reading configuration settings and launching necessary applications for the automation process.

2. **Get Transaction Data:** Retrieve the next transaction item from the queue or data source, preparing it for processing.

3. **Process Transaction:** Execute the main business logic on the retrieved transaction, handling success and exceptions appropriately.

4. **End Process:** Conclude the automation by closing applications and logging out, ensuring a clean exit from the workflow.

5. **Error Handling:** Implement robust mechanisms to manage exceptions throughout the process, logging errors and allowing for retries or graceful exits.

Process Design

- Sub Process

1. Configuration Management: Store and retrieve configuration settings from an external file (e.g., Config.xlsx) to avoid hardcoding values in the automation scripts.

2. Data Scraping: Automatically collect app reviews and relevant metadata from the Play Store for analysis**.**

3. Sentiment Analysis: Analyze scraped data to categorize reviews into positive, negative, or neutral sentiments for actionable insights**.**

4. Excel Report Generation: Create structured Excel reports from processed data, facilitating easy access and further analysis of feedback trends.

5. Logging and Monitoring: Maintain detailed logs of transactions and errors to support troubleshooting and provide insights into system performance.

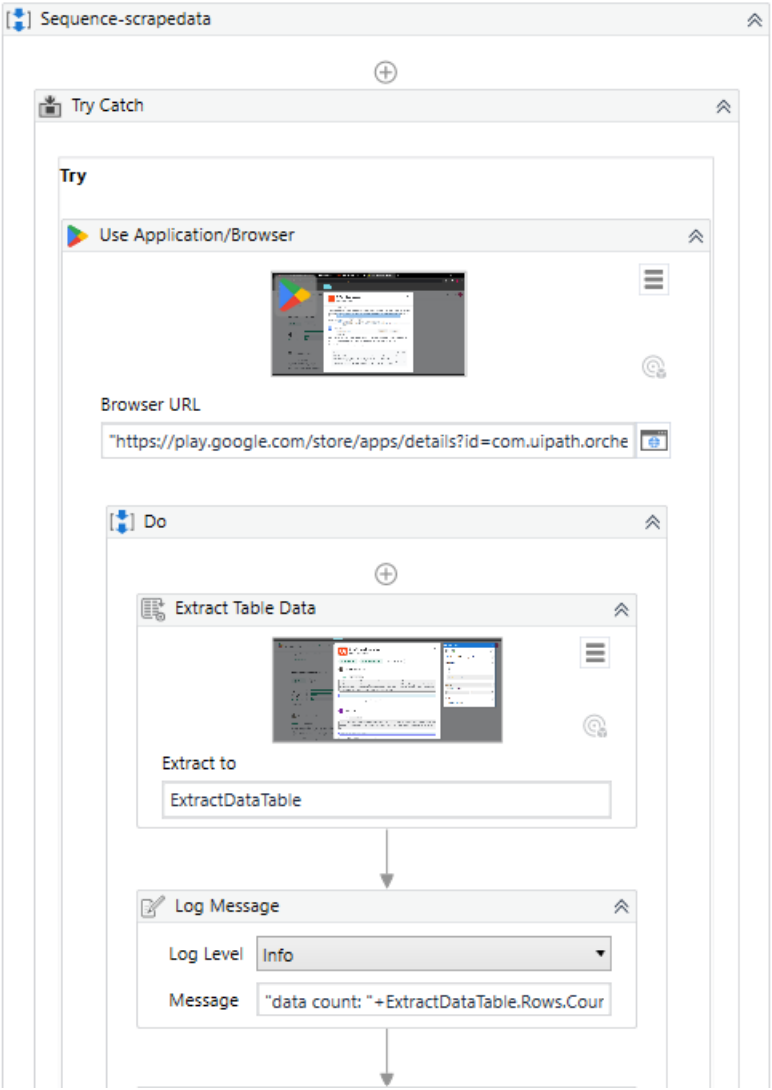
Implementation

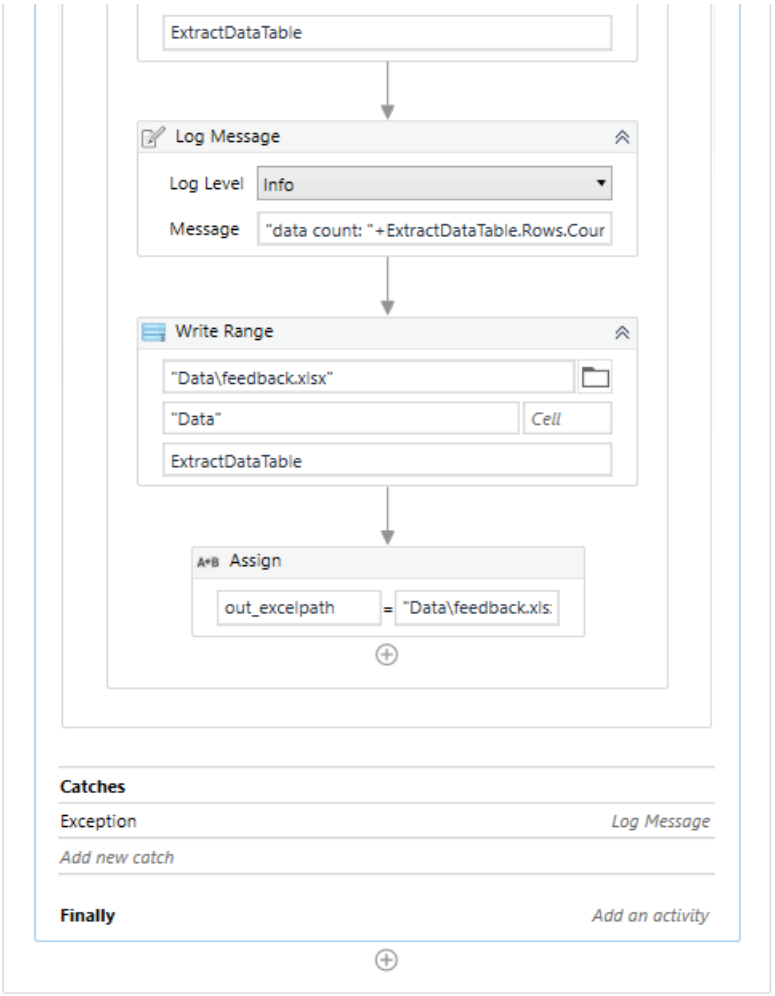
- Implementation of Module 1

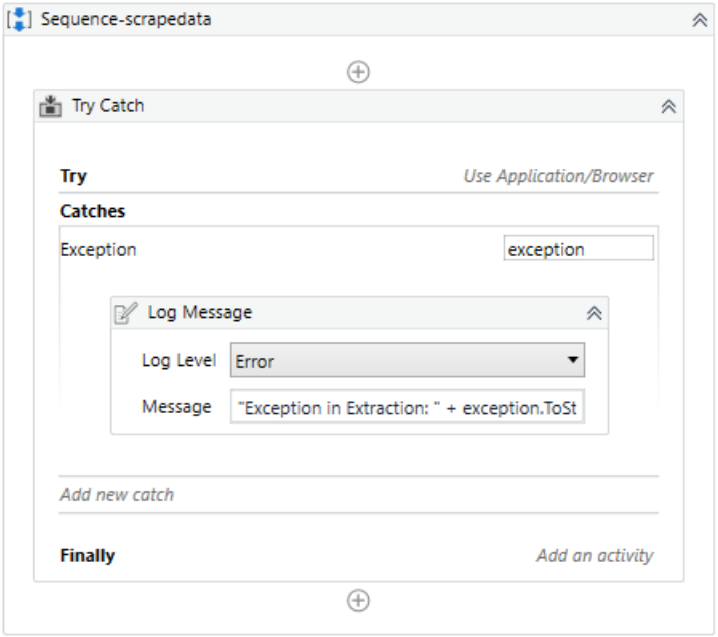
Module 1 focuses on gathering app reviews from URL's given from play store. In this part of the module, the system scraps details , such as:

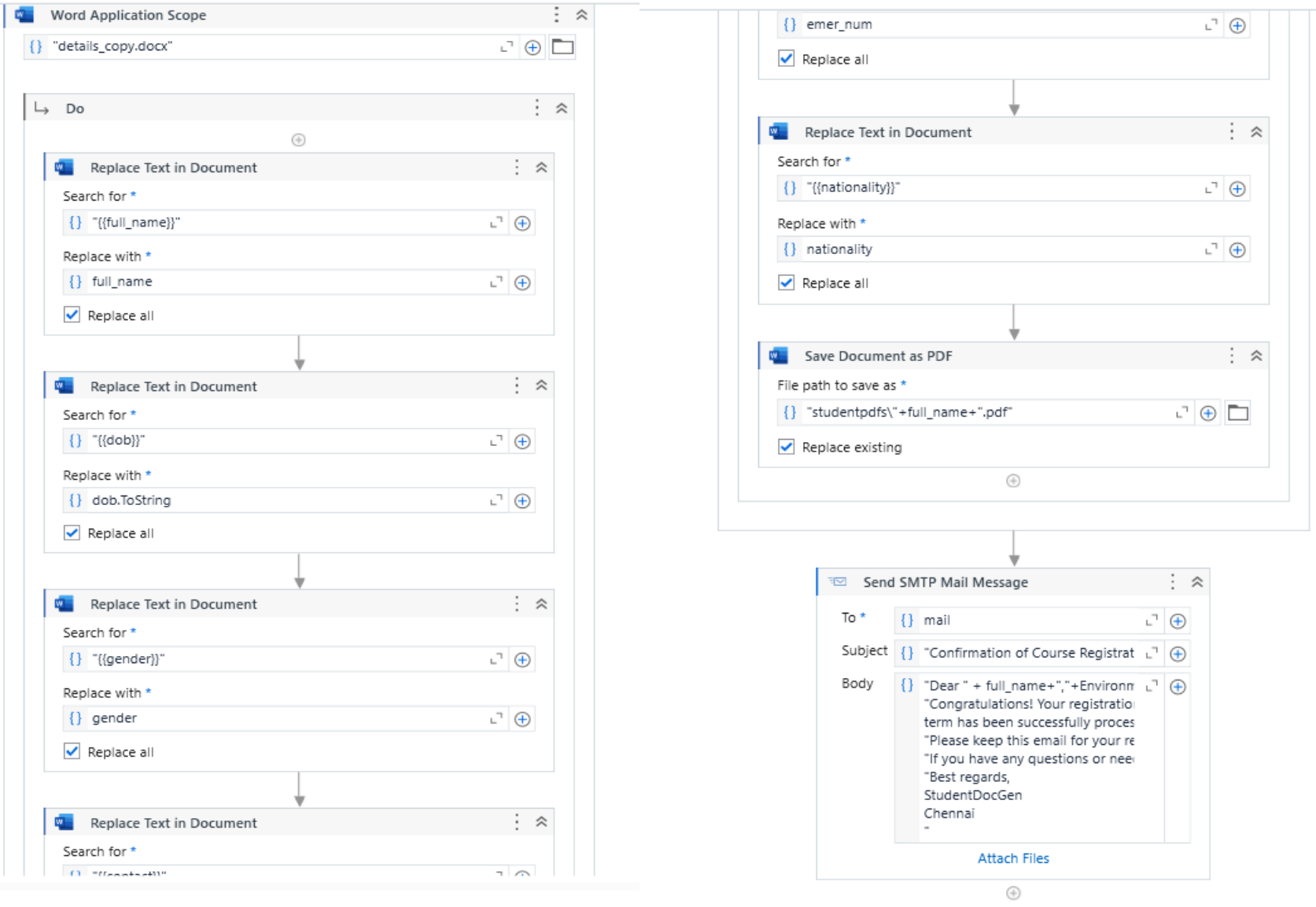
- Date
- Review
- How many people found it helpful?

Implementation Screenshots




ExtractDataTable
Log Message
Log Level
Info
Message
"data count: "+ExtractDataTable.Rows.Cour
Write Range
"Data\feedback.xlsx"
"Data"
Cell
ExtractDataTable
Assign
out_excelpath
=
"Data\feedback.xls
Catches
Exception
Log Message
Add new catch
Finally
Add an activity


Sequence-scrapedata
Try Catch
Try
Use Application/Browser
Catches
Exception
exception
Log Message
Log Level
Error
Message
"Exception in Extraction: " + exception.ToSt
Add new catch
Finally
Add an activity


Word Application Scope
"details_copy.docx"
Do
Replace Text in Document
Search for *
"{{full_name}}"
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full_name
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Replace Text in Document
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"{{gender}}"
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Replace existing
Send SMTP Mail Message
To *
mail
Subject
"Confirmation of Course Registrat
Body
"Dear " + full_name+","+Environm
"Congratulations! Your registratio
term has been successfully proces
"Please keep this email for your re
"If you have any questions or nee
"Best regards,
StudentDocGen
Chennai
"
Attach Files

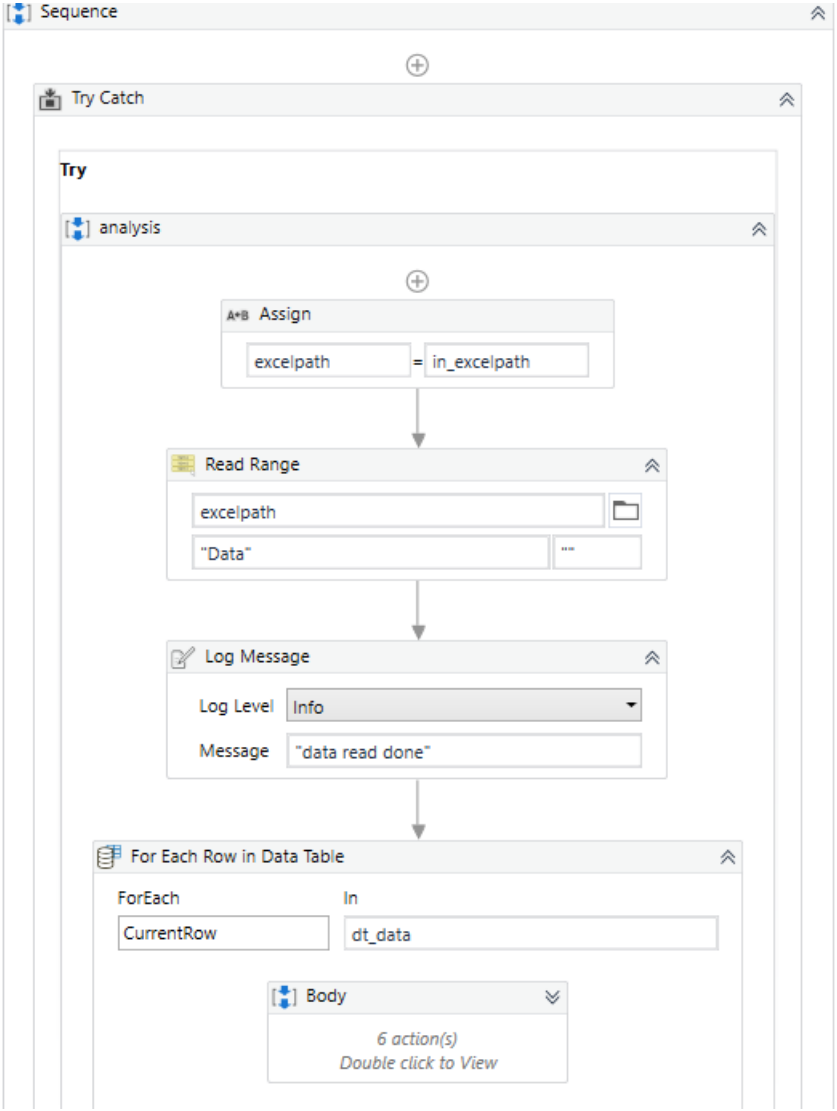
Implementation

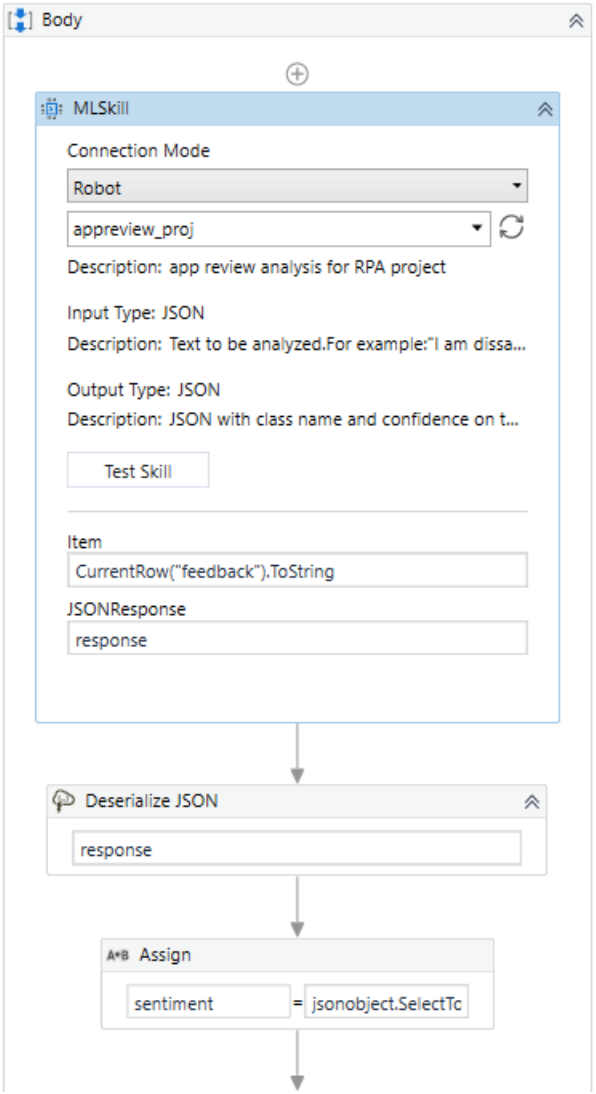
- Implementation of Module 2

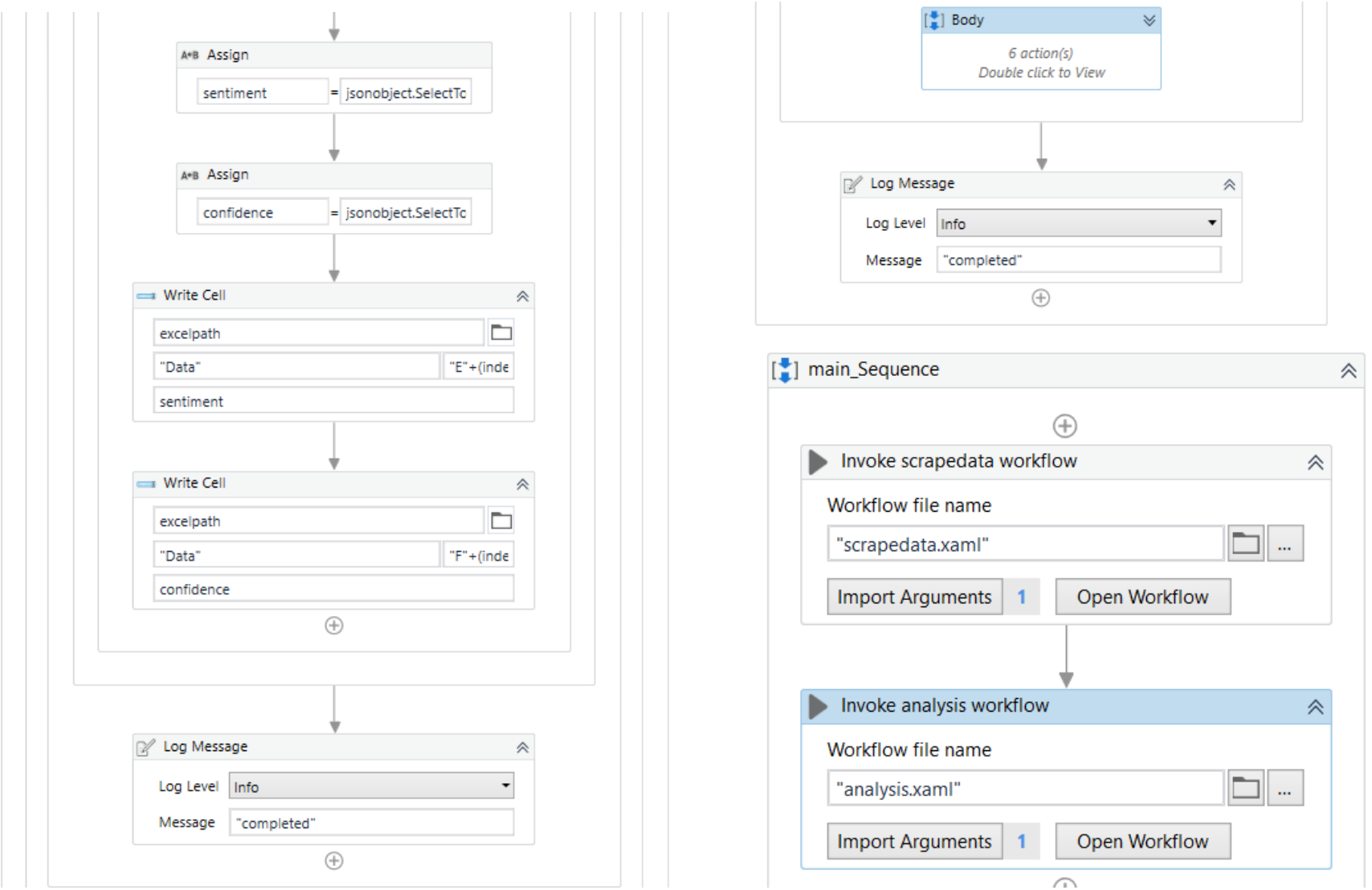
In this part, the system makes a connection with AI Center to use the ML package and ML skill which has been deployed for sentiment analysis to provide the sentiment and confidence level.

- Data read
- Data analyse
- Create excel

Implementation Screenshots

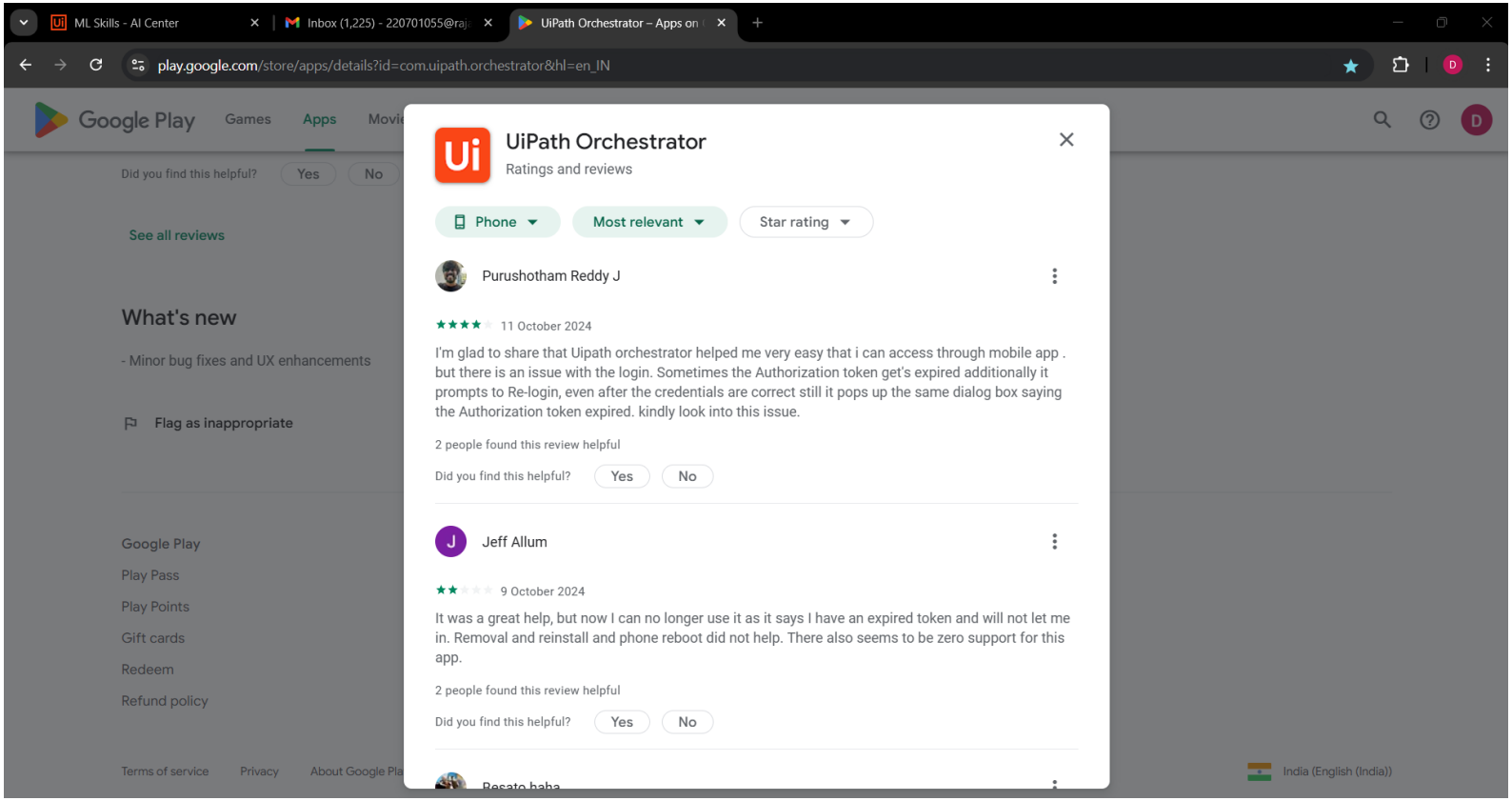




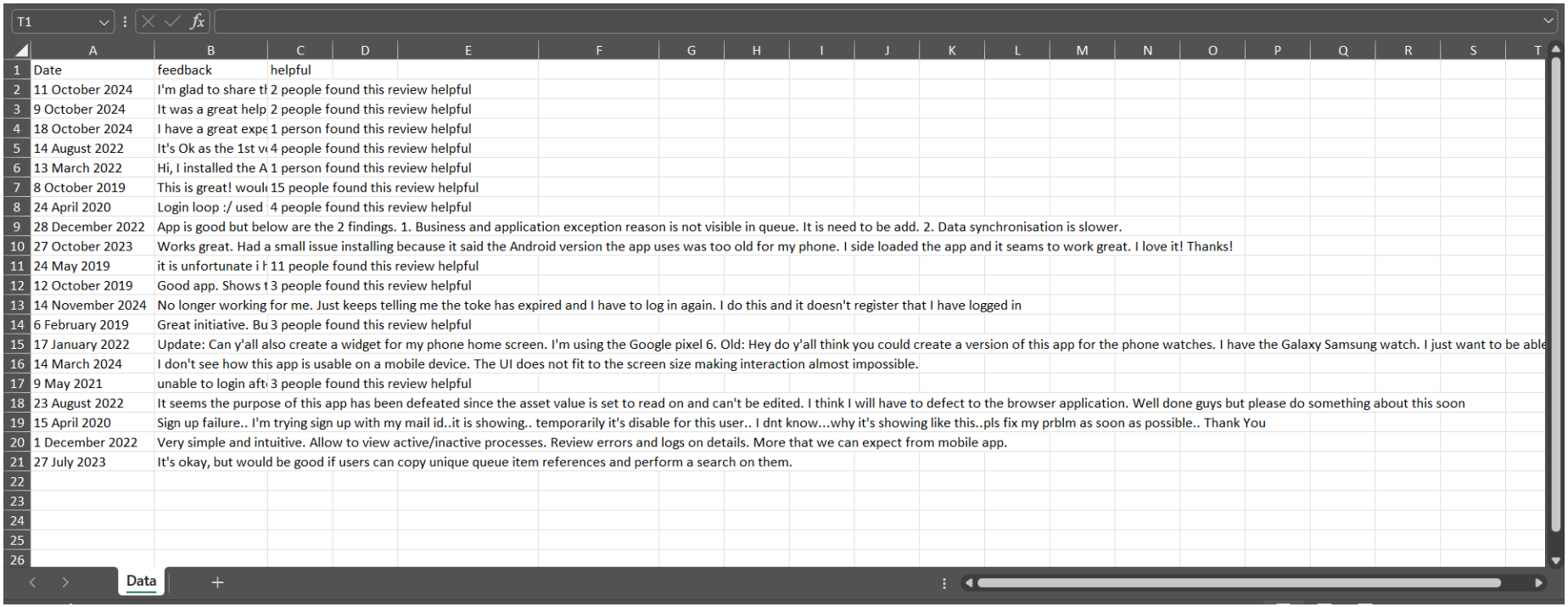

Assign
sentiment
=
jsonobject.SelectTc
Assign
confidence
=
jsonobject.SelectTc
Write Cell
excelpath
"Data"
"E"+(inde
sentiment
Write Cell
excelpath
"Data"
"F"+(inde
confidence
Log Message
Log Level
Info
Message
"completed"
Body
6 action(s)
Double click to View
Log Message
Log Level
Info
Message
"completed"
main_Sequence
Invoke scrapedata workflow
Workflow file name
"scrapedata.xaml"
Import Arguments
1
Open Workflow
Invoke analysis workflow
Workflow file name
"analysis.xaml"
Import Arguments
1
Open Workflow

Testing

Module 1:



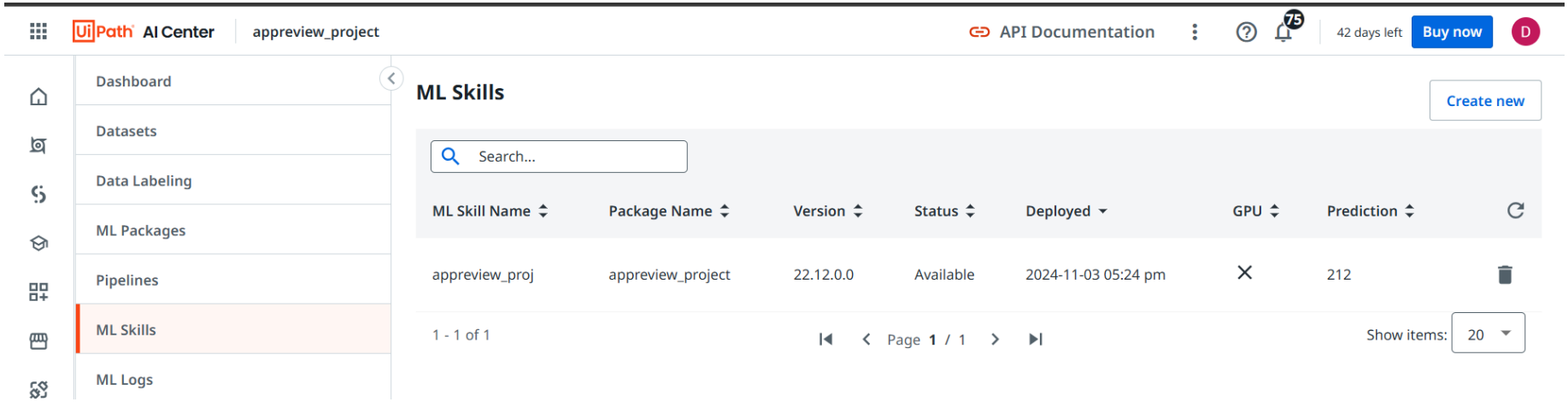
Output

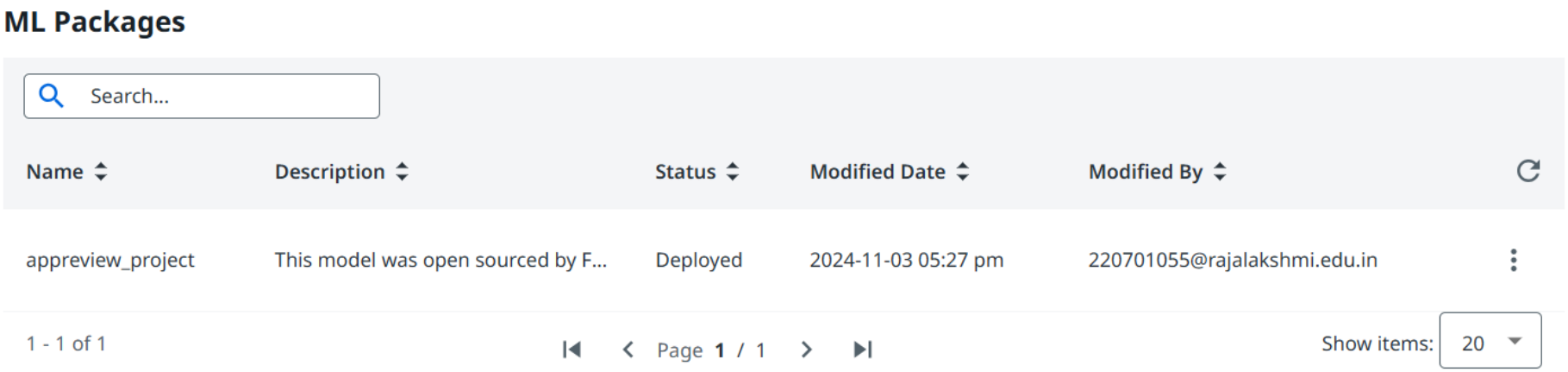


	A	B	C
1	Date	feedback	helpful
2	11 October 2024	I'm glad to share tl	2 people found this review helpful
3	9 October 2024	It was a great help	2 people found this review helpful
4	18 October 2024	I have a great expe	1 person found this review helpful
5	14 August 2022	It's Ok as the 1st v	4 people found this review helpful
6	13 March 2022	Hi, I installed the A	1 person found this review helpful
7	8 October 2019	This is great! woul	15 people found this review helpful
8	24 April 2020	Login loop :/ used	4 people found this review helpful
9	28 December 2022	App is good but below are the 2 findings. 1. Business and application exception reason is not visible in queue. It is need to be add. 2. Data synchronisation is slower.	
10	27 October 2023	Works great. Had a small issue installing because it said the Android version the app uses was too old for my phone. I side loaded the app and it seams to work great. I love it! Thanks!	
11	24 May 2019	it is unfortunate i h	11 people found this review helpful
12	12 October 2019	Good app. Shows t	3 people found this review helpful
13	14 November 2024	No longer working for me. Just keeps telling me the toke has expired and I have to log in again. I do this and it doesn't register that I have logged in	
14	6 February 2019	Great initiative. Bu	3 people found this review helpful
15	17 January 2022	Update: Can y'all also create a widget for my phone home screen. I'm using the Google pixel 6. Old: Hey do y'all think you could create a version of this app for the phone watches. I have the Galaxy Samsung watch. I just want to be able	
16	14 March 2024	I don't see how this app is usable on a mobile device. The UI does not fit to the screen size making interaction almost impossible.	
17	9 May 2021	unable to login afte	3 people found this review helpful
18	23 August 2022	It seems the purpose of this app has been defeated since the asset value is set to read on and can't be edited. I think I will have to defect to the browser application. Well done guys but please do something about this soon	
19	15 April 2020	Sign up failure.. I'm trying sign up with my mail id..it is showing.. temporarily it's disable for this user.. I dnt know...why it's showing like this..pls fix my prblm as soon as possible.. Thank You	
20	1 December 2022	Very simple and intuitive. Allow to view active/inactive processes. Review errors and logs on details. More that we can expect from mobile app.	
21	27 July 2023	It's okay, but would be good if users can copy unique queue item references and perform a search on them.	

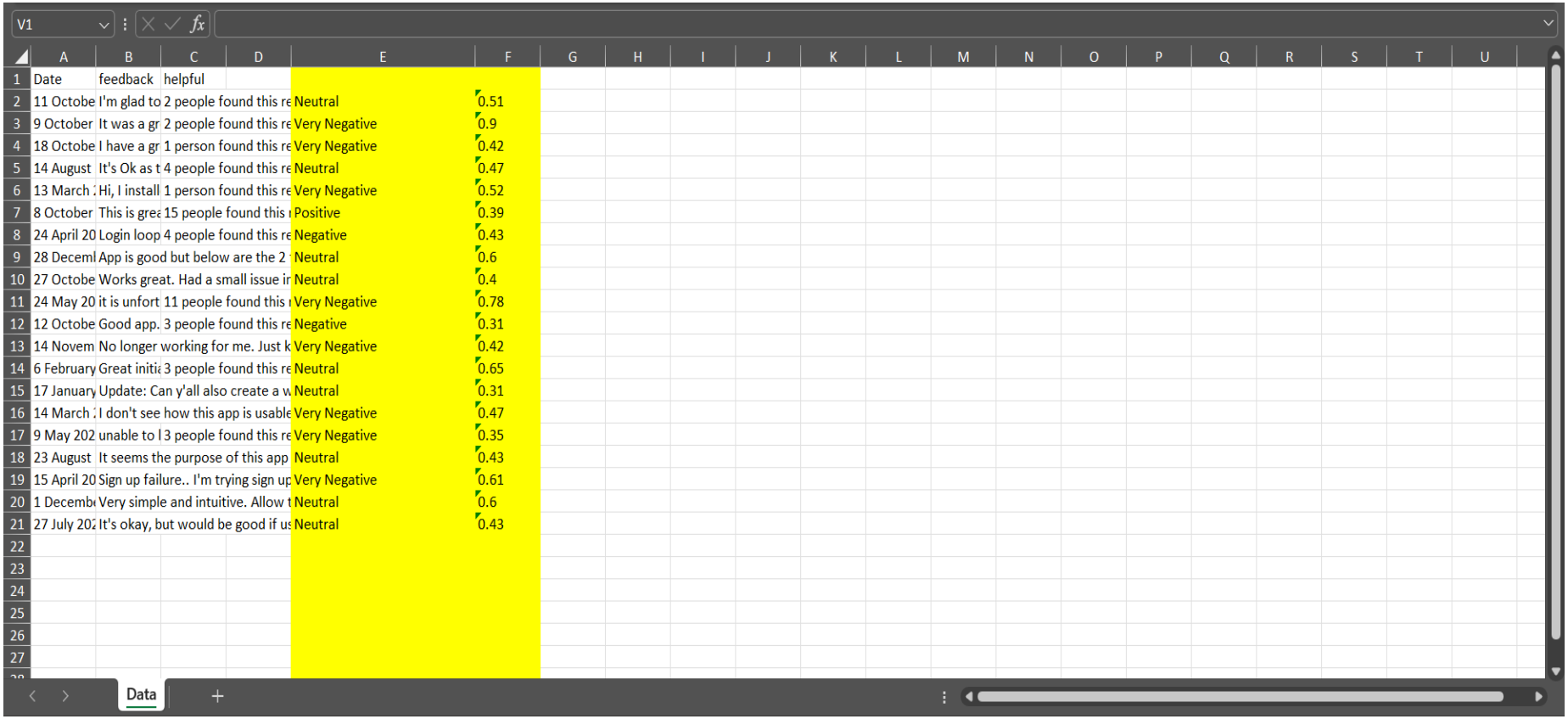
Testing

Module 2:





Output



	A	B	C	D	E	F
1	Date	feedback	helpful			
2	11 Octobe	I'm glad to	2 people found this re		Neutral	0.51
3	9 October	It was a gr	2 people found this re		Very Negative	0.9
4	18 Octobe	I have a gr	1 person found this re		Very Negative	0.42
5	14 August	It's Ok as t	4 people found this re		Neutral	0.47
6	13 March 2	Hi, I install	1 person found this re		Very Negative	0.52
7	8 October	This is grea	15 people found this i		Positive	0.39
8	24 April 20	Login loop	4 people found this re		Negative	0.43
9	28 Decem	App is good but below are the 2			Neutral	0.6
10	27 Octobe	Works great. Had a small issue ir			Neutral	0.4
11	24 May 20	it is unfort	11 people found this i		Very Negative	0.78
12	12 Octobe	Good app.	3 people found this re		Negative	0.31
13	14 Novem	No longer working for me. Just k			Very Negative	0.42
14	6 February	Great initia	3 people found this re		Neutral	0.65
15	17 January	Update: Can y'all also create a w			Neutral	0.31
16	14 March 2	I don't see how this app is usable			Very Negative	0.47
17	9 May 202	unable to l	3 people found this re		Very Negative	0.35
18	23 August	It seems the purpose of this app			Neutral	0.43
19	15 April 20	Sign up failure.. I'm trying sign up			Very Negative	0.61
20	1 Decembe	Very simple and intuitive. Allow t			Neutral	0.6
21	27 July 202	It's okay, but would be good if us			Neutral	0.43
22						
23						
24						
25						
26						
27						

Conclusions

This project develops a **Sentiment Analysis System** using natural language processing (NLP) and machine learning (ML) to analyze user reviews and gain insights into customer opinions. By automating data collection, preprocessing, and sentiment analysis, the system provides businesses with an efficient way to assess feedback at scale. It collects data through manual input or web scraping, preprocesses it for standardization, and classifies reviews as positive, negative, or neutral. The aggregated results are presented in professional reports for stakeholders. The key benefit is the ability to monitor customer sentiment in real-time, enabling quick responses to negative feedback and enhancing customer satisfaction. Overall, the system streamlines review analysis and improves decision-making, with potential for future enhancements using advanced NLP techniques.

Future Enhancement

1. **Integration of Advanced NLP Techniques:** Future enhancements could involve incorporating more sophisticated natural language processing methods, such as transformer models (e.g., BERT or GPT), to improve the system's ability to understand context and nuances in language, leading to more accurate sentiment classification.

2. **Real-time Sentiment Analysis and Feedback Loop:** Implementing real-time sentiment analysis capabilities would allow businesses to monitor customer feedback as it occurs, enabling immediate responses to negative sentiments and creating a feedback loop that continuously improves customer engagement and satisfaction.

References

1. URL: https://docs.uipath.com
2. URL: https://docs.uipath.com/activities/docs/excel-automation
3. URL: https://academy.uipath.com
4. URL: https://forum.uipath.com
5. URL: https://play.google.com/store/apps/details?id=com.uipath.orchestrator&hl=en_IN

THANK YOU.