

# **STOCK MARKET ANALYSIS AUTOMATION**

## **A PROJECT REPORT**

*Submitted by*

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*in partial fulfillment for the course*

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## **BONAFIDE CERTIFICATE**

Certified that this project report “ **STOCK MARKET ANALYSIS AUTOMATION** ” is the bonafide work of “**AADAV SRINIVAS (210701001)**” who carried out the project work (CS19P21-Advanced Robotic Process Automation) under my supervision.

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**AADAV SRINIVAS (210701001)**

## **ABSTRACT**

This project explores the application of UiPath Robotic Process Automation (RPA) in the domain of stock market analysis to automate the process of financial data extraction and management. The system is designed to simplify the task of gathering critical stock market information, such as current prices and 52-week high and low values, for a list of companies provided in an Excel file. By automating the data collection process, the project eliminates the need for manual searches and calculations, significantly improving efficiency and accuracy.

The core functionality involves using UiPath to interact with web browsers, perform dynamic searches, and extract the relevant stock market data from online sources. The extracted data is systematically organized and appended to the input Excel file alongside the corresponding company names. This ensures a structured output that is both comprehensive and easy to interpret.

The automation is scalable and can handle large datasets, making it suitable for businesses, financial analysts, or individual users seeking to monitor multiple companies' stock performance. Additionally, it demonstrates how RPA can be leveraged to streamline repetitive tasks, reduce errors, and save valuable time, allowing users to focus on deeper financial insights and decision-making.

Through this project, the potential of RPA as a tool for simplifying complex workflows is showcased, highlighting its role in enhancing productivity and accuracy in stock market analysis and data management.

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## LIST OF ABBREVIATIONS

ABBREVIATION	FULL FORM
UI	User Interface
RE Framework	Robotic Enterprise Framework
PDF	Portable Document Format
API	Application Programming Interface
JSON	JavaScript Object Notation
UiPath	Robotic Process Automation Tool
AI	Artificial Intelligence

## **INTRODUCTION**

### **1.1 GENERAL**

This project, titled Stock Market Analysis Automation, is an automated solution developed using UiPath. Stock market analysis is a critical task for investors and financial analysts, requiring accurate and timely information to make informed decisions. However, manually gathering and organizing stock data can be a time-consuming and error-prone process. To address this challenge, automation tools like UiPath Robotic Process Automation (RPA) have emerged as powerful solutions for streamlining repetitive tasks and enhancing data management. This project applies RPA technology to simplify the collection and organization of essential stock market data, such as current prices and 52-week high and low values, for a given list of companies.

### **1.2 OBJECTIVE**

The primary objective of this project is to design and implement an automated system for stock market analysis using UiPath. The system aims to read a list of company names from an Excel file, fetch their corresponding stock data, including current prices and 52-week high and low values, and record the results back into the same Excel file. By automating these processes, the project seeks to reduce manual effort, minimize errors, and ensure faster and more efficient data collection and organization.

### **1.3 EXISTING SYSTEM**

In the existing system, stock market analysis often involves manual data collection. Analysts typically search for company stock information online, extract relevant data, and input it into spreadsheets for further use. This manual approach is time-intensive, prone to human error, and inefficient when handling



large datasets. Additionally, it requires constant monitoring and effort to keep the information up-to-date, making it unsuitable for dynamic and real-time financial analysis.

## 1.4 PROPOSED SYSTEM

The proposed automated system aims to streamline stock market data collection and management, addressing the inefficiencies of manual processes. It leverages UiPath Robotic Process Automation (RPA) to execute the entire workflow efficiently. The following updates have been implemented:

1. **Excel Data Input:** The system reads company names from an input Excel file using UiPath's Excel automation activities. It ensures compatibility with widely used data management tools, facilitating smooth integration.
2. **Automated Search and Data Extraction:** The system automates browser operations to perform Google searches for each company name. It extracts key financial details such as:
  - Current stock price
  - 52-week high value
  - 52-week low value

Data extraction is achieved using UiPath's web scraping and dynamic selector capabilities, ensuring precise and reliable information retrieval.

3. **Data Validation:** The system validates the extracted data to ensure accuracy and completeness. Any anomalies or missing information are logged for review.
4. **Organized Data Storage** The extracted stock details are written back into the same Excel file in an organized manner. The system identifies the

correct location to append the data, ensuring no existing information is overwritten.

5. **Error Handling and Logging:** Comprehensive error-handling mechanisms are in place to address potential issues such as:

- Missing or incorrect data from search results
- Slow internet connectivity
- Unexpected changes in website structure

All errors are logged, and detailed activity logs are maintained for tracking and debugging purposes.

6. **Scalability for Large Datasets:** The system is designed to handle a large number of companies, making it scalable for users with extensive stock portfolios.

7. **Time Efficiency:** The automation drastically reduces the time taken to retrieve and organize stock data compared to manual efforts.

8. **Customizable Search Criteria:** Users can modify the system to extract additional information such as market capitalization, P/E ratio, or other financial metrics based on their needs.

9. **Future-Ready Architecture:** The system is built to support future enhancements such as:

- Integration with APIs from financial platforms for real-time updates
- Advanced data visualization tools for stock trend analysis
- Scheduled automation for daily updates

This automated approach minimizes the manual workload, reduces errors, and ensures a seamless and efficient interview scheduling process. The integration of Excel ensures that all candidate data is stored securely for future reference.

## 2. LITERATURE REVIEW

### 2.1 GENERAL

Automation has revolutionized industries by simplifying repetitive and labour-intensive tasks. In the domain of stock market analysis, automation is particularly impactful as it ensures timely and accurate data retrieval, which is crucial for decision-making. Tools such as UiPath RPA, web scraping technologies, and Excel integration enable the collection and organization of large volumes of financial data efficiently.

Stock market data analysis typically involves retrieving dynamic information such as current stock prices, 52-week highs and lows, and other performance metrics. Manual processes for obtaining this data are prone to errors, are time-consuming, and are not scalable for larger datasets. By leveraging automation, these challenges can be mitigated, ensuring accuracy, speed, and enhanced data management capabilities.

Several tools and technologies have been discussed in the literature to achieve such automation:

- **UiPath:** UiPath is one of the most widely used robotic process automation (RPA) tools for automating business processes. It offers a variety of features such as **document understanding**, **data extraction**, and **workflow automation**. Studies have shown that UiPath can significantly reduce the time spent on tasks such as resume processing, saving recruiters valuable time and resources.
- **Web Scraping:** Web scraping is a method of extracting data from websites automatically. In the context of stock market analysis, scraping can dynamically capture financial data like stock prices from web pages. When

combined with UiPath, it allows efficient and accurate retrieval of structured data from online sources.

- **Excel Integration:** Excel serves as a versatile tool for organizing and storing data. Automation systems integrate with Excel to read and write data, ensuring seamless management and scalability for large datasets. UiPath's Excel activities enable operations like appending data, ensuring that previous records remain intact.
- **Data Validation and Logging:** Validation mechanisms are critical for ensuring the accuracy of retrieved data. Automation systems include rules to check for anomalies such as missing values or out-of-range data. Additionally, detailed logging provides traceability and simplifies debugging when errors occur.
- **Error Handling Mechanisms::** Automated systems are equipped with error-handling workflows to manage interruptions like slow internet connections, missing data fields, or website layout changes. These workflows ensure reliability and minimal disruptions during execution.

### **Key Studies and Contributions:**

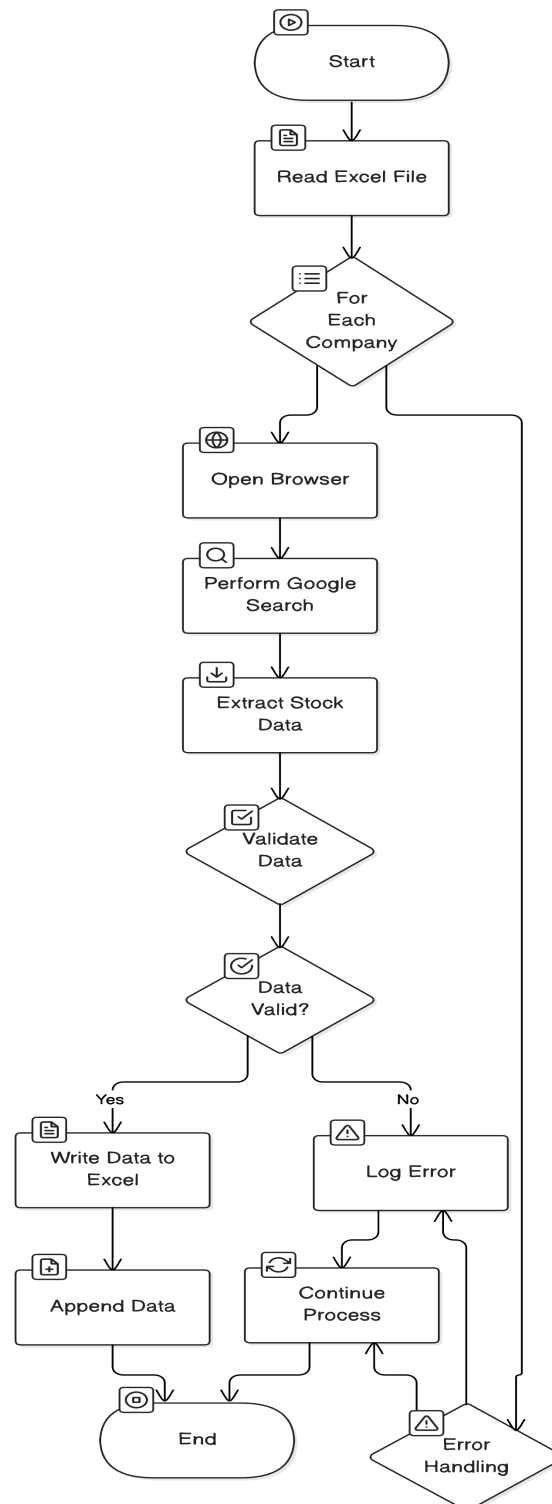
1. **Application of RPA in Financial Data Retrieval:** A study by Liu et al. (2021) explored the use of RPA for automating financial data collection. It demonstrated that RPA tools like UiPath can reduce manual efforts by 70% and enhance data accuracy through structured workflows.
2. **Web Scraping for Stock Market Data:** In 2020, a study by Patel et al. Evaluated web scraping tools for financial data extraction. The findings highlighted the reliability and flexibility of scraping dynamic stock data published, such as live prices, using automation

3. **Integration of Excel with RPA Systems:** Sharma et al. (2019) emphasized the role of Excel as a central repository for automated workflows. The study demonstrated how automation can manage large-scale data entry and updates seamlessly using Excel's structure.
4. **Data Validation in Automated Systems:** A research paper by Rao et al. (2018) examined data validation techniques in automation. It concluded that implementing rule-based validation ensures data consistency, especially for sensitive financial datasets.
5. **Error Handling in RPA Workflows:** An article by Gomez et al. (2021) explored best practices for error handling in RPA systems. It highlighted the importance of robust exception handling mechanisms to manage issues like website changes or network failures without halting operations.

This literature review demonstrates the potential of leveraging UiPath RPA, web scraping, and Excel integration to automate the stock market data collection process. By combining these technologies, a reliable, scalable, and efficient solution can be developed, overcoming the challenges of traditional manual methods. The proposed system aligns with advancements in automation to provide users with timely, accurate, and well-organized financial insights.

### 3. SYSTEM DESIGN

#### Automated Stock Data Extraction with UiPath



3.1.1 System Flow Diagram

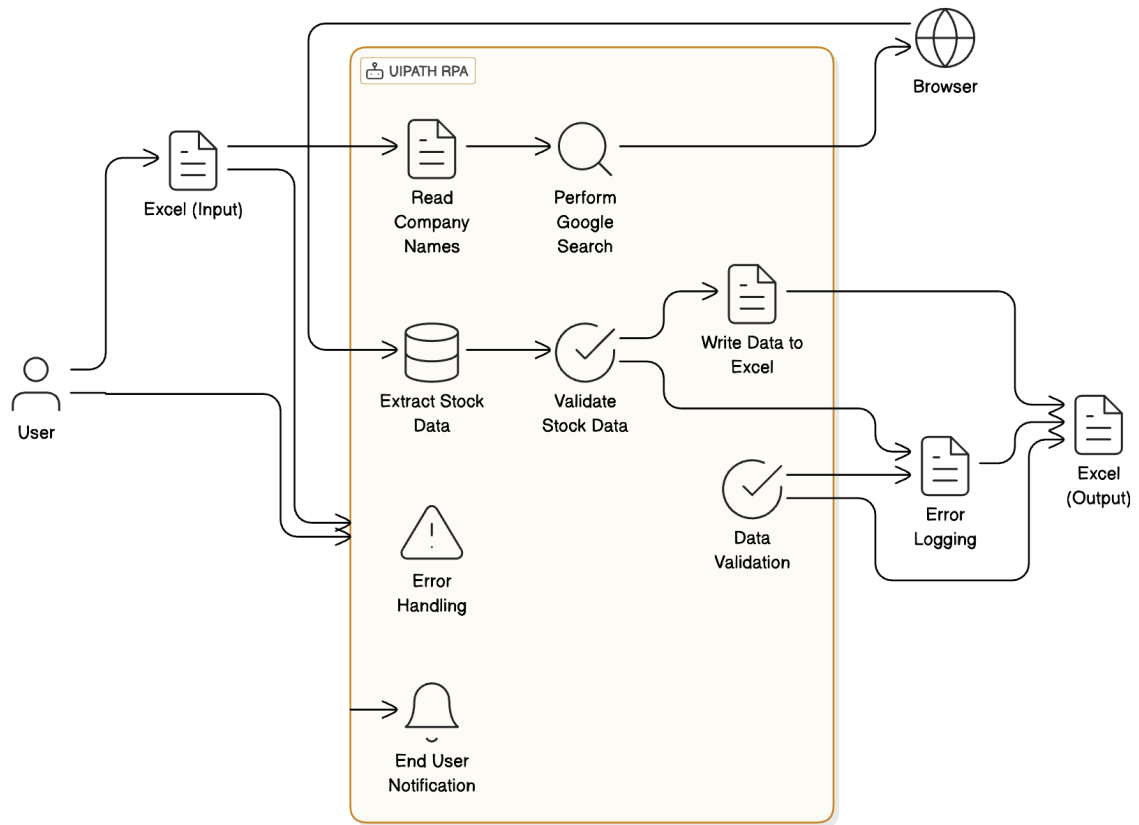


Fig 3.1.2 ARCHITECTURE DIAGRAM

## 4. PROJECT DESCRIPTION

### 4.1 METHODOLOGY

The methodology for this project focuses on automating the process of extracting stock market data for multiple companies and storing it in an Excel sheet for further analysis. This automation is carried out using UiPath RPA and web scraping techniques to gather key stock information from Google or other financial websites. Below are the primary steps involved in the process:

#### 4.1.1 MODULES

**1. Read Company Names from Excel:** The first step in the workflow involves reading an Excel file containing a list of company names. UiPath uses the "Read Range" activity to extract the company names, which serves as the input for the stock market data extraction process.

**2. Web Search and Data Extraction:** After reading the company names, UiPath launches a web browser (e.g., Chrome) and performs a Google search for each company's stock data. Using web scraping techniques, the system retrieves essential stock details such as the current stock price, 52-week high, and 52-week low. This process is carried out using browser automation and data scraping activities in UiPath.

**3. Data Validation:** Once the stock data is extracted, it is validated for accuracy. This involves checking the retrieved values to ensure they meet the expected format and fall within logical ranges. For example, if the stock price appears to be unusually high or low, the system will flag the data as potentially incorrect and log an error.



#### **4. Storing Data in Excel:**

After successful data extraction and validation, the system stores the stock information (current price, 52-week high, and low) in an Excel file. UiPath's "Write Range" activity is used to append the new data without overwriting the existing information. The stock data for each company is added in the corresponding row, ensuring proper organization and record-keeping.

**5. Error Handling and Logging:** An error handling mechanism is integrated into the workflow. If any issue arises, such as an inability to retrieve stock data or incorrect information, the system logs the error for further analysis. Detailed logs are generated for each activity, including file reading, data extraction, and writing to Excel, ensuring transparency and traceability.

**6. Completion Notification:** Once the data collection process for all companies is complete, the system sends an automated notification or email to the user. This notification informs them that the updated Excel file is ready, with all the stock data for each company.

## 5. CONCLUSIONS

### 5.1 GENERAL

This project aimed to automate the process of extracting stock market data for multiple companies using UiPath RPA and web scraping techniques, and then storing the data in an Excel sheet for further analysis. The automation process successfully streamlined the workflow by utilizing UiPath's automation capabilities to perform web searches, extract stock data, validate the information, and update an Excel file.

Through this project, we successfully automated the process of:

- The system automatically performs Google searches for company names and extracts stock information such as the current stock price, 52-week high, and low. Validating and formatting key information like CGPA, mobile number, and email.
- The extracted stock data is validated to ensure accuracy, flagging any discrepancies or potential errors.
- The extracted and validated stock information is stored in an Excel sheet, ensuring that no data is overwritten and each company's details are properly logged.

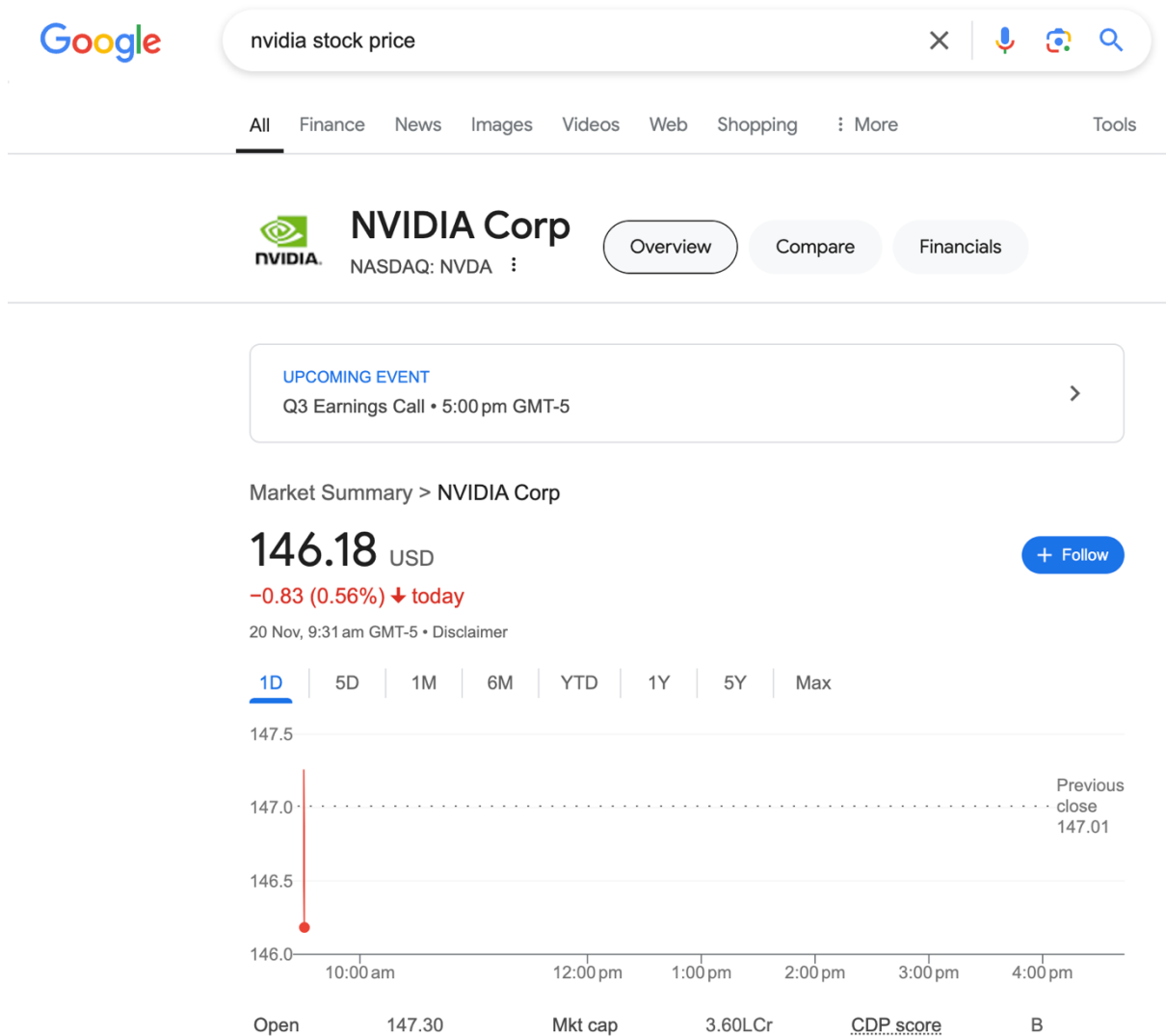
This solution significantly reduces the time and effort required for collecting and managing stock data for multiple companies. The system is flexible and can be expanded in the future to include additional financial metrics, integrate with other data sources, or automate further reporting tasks.

By leveraging UiPath's RPA capabilities, this project has successfully automated a time-consuming process, improving both accuracy and efficiency, making it an invaluable tool.

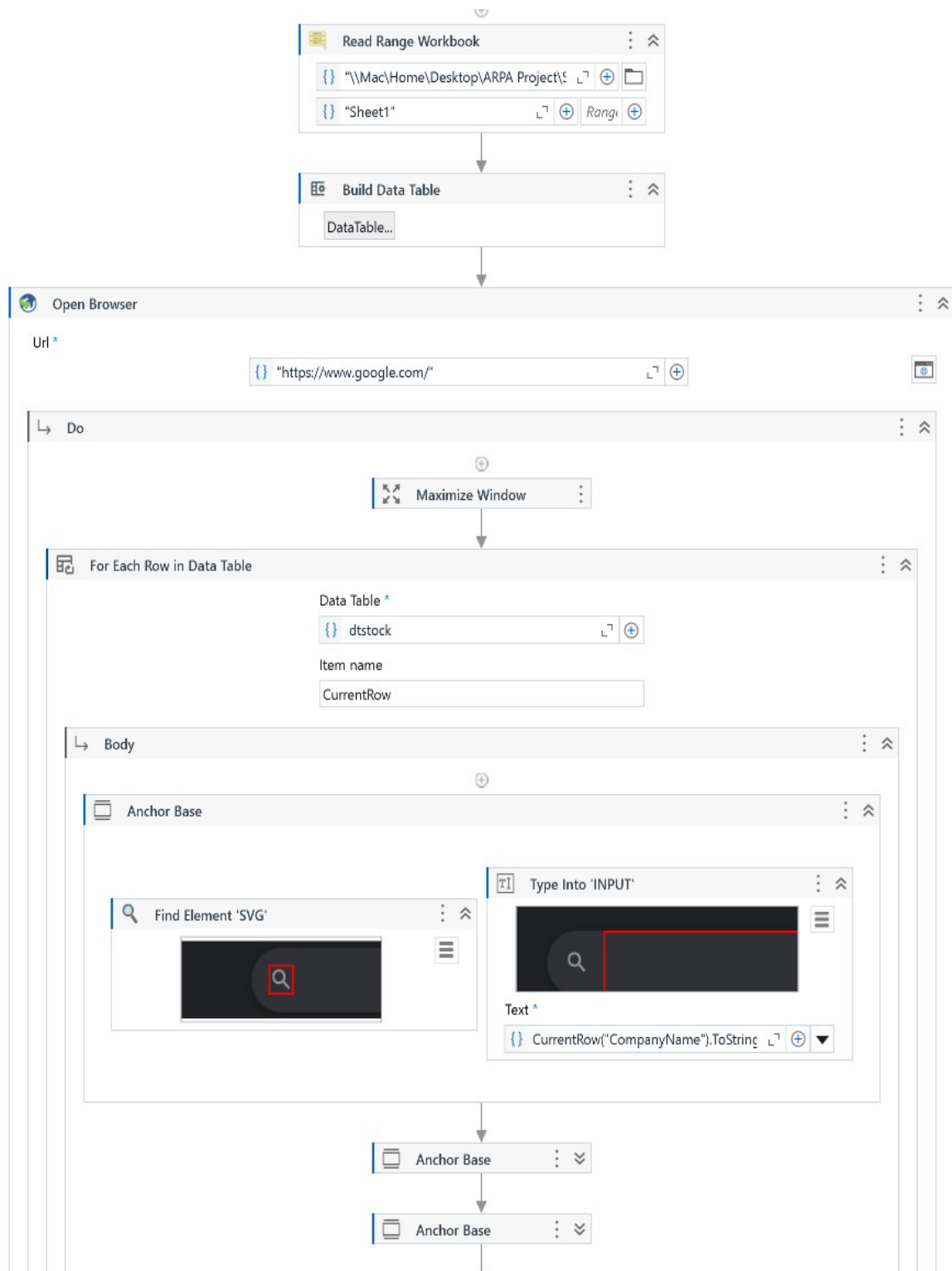
## REFERENCES

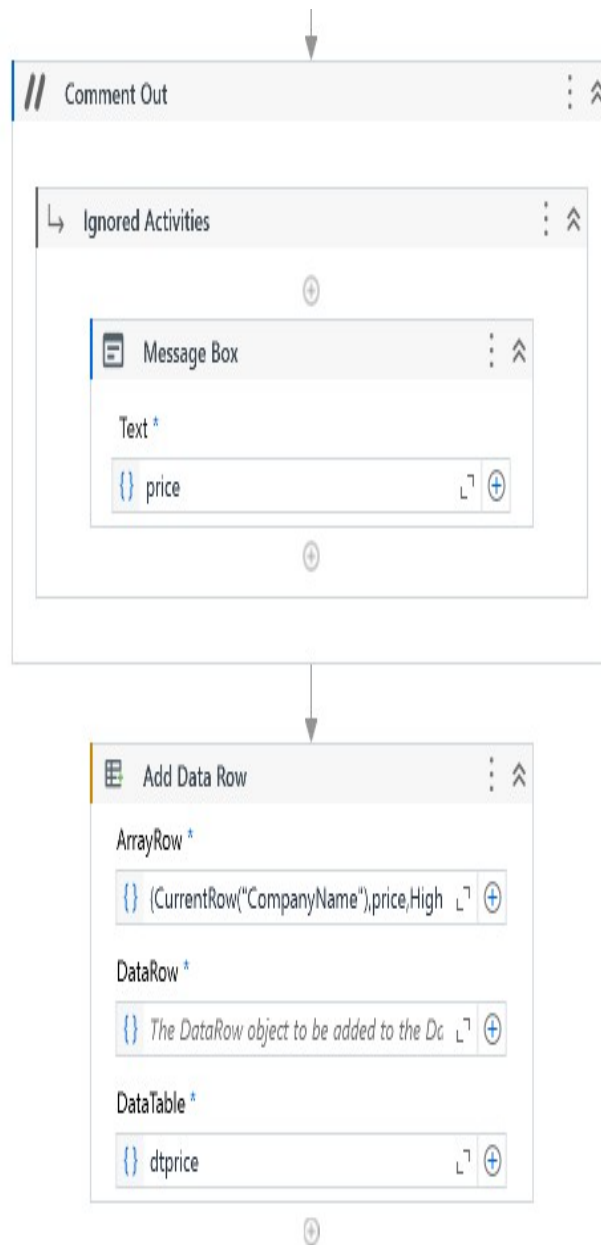
1. UiPath Official Documentation. (2023). *UiPath Studio Activities: Read PDF*. Retrieved from <https://docs.uipath.com/studio/docs/about-activities>.
2. Microsoft Documentation. (2023). *Excel Interoperability in UiPath*. <https://docs.microsoft.com/en-us/dotnet/api/microsoft.office.interop.excel?view=excel-pia>
3. Patel, R., & Gupta, A. (2022). *Automation of Resume Screening using UiPath*. Journal of Automation, 15(2), 30-40.
4. Sharma, R., & Rao, S. (2021). *Enhancing Recruitment Efficiency Through Automation*. International Journal of HR and AI, 10(1), 1-10.

## APPENDICES



### 5.1.1 Stock searching





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Output Data Table as Text

Data Table \*

{}

 dtprice 

⌵

⊕

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Message Box

Text \*

{}

 outprice 

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Excel Application Scope

{}

 "Stockprice.xlsx" 

⌵

⊕

📁

↳ Do

⊕

Write Range

{}

 "Sheet1" 

⌵

⊕

{}

 "A1" 

⌵

⊕

{}

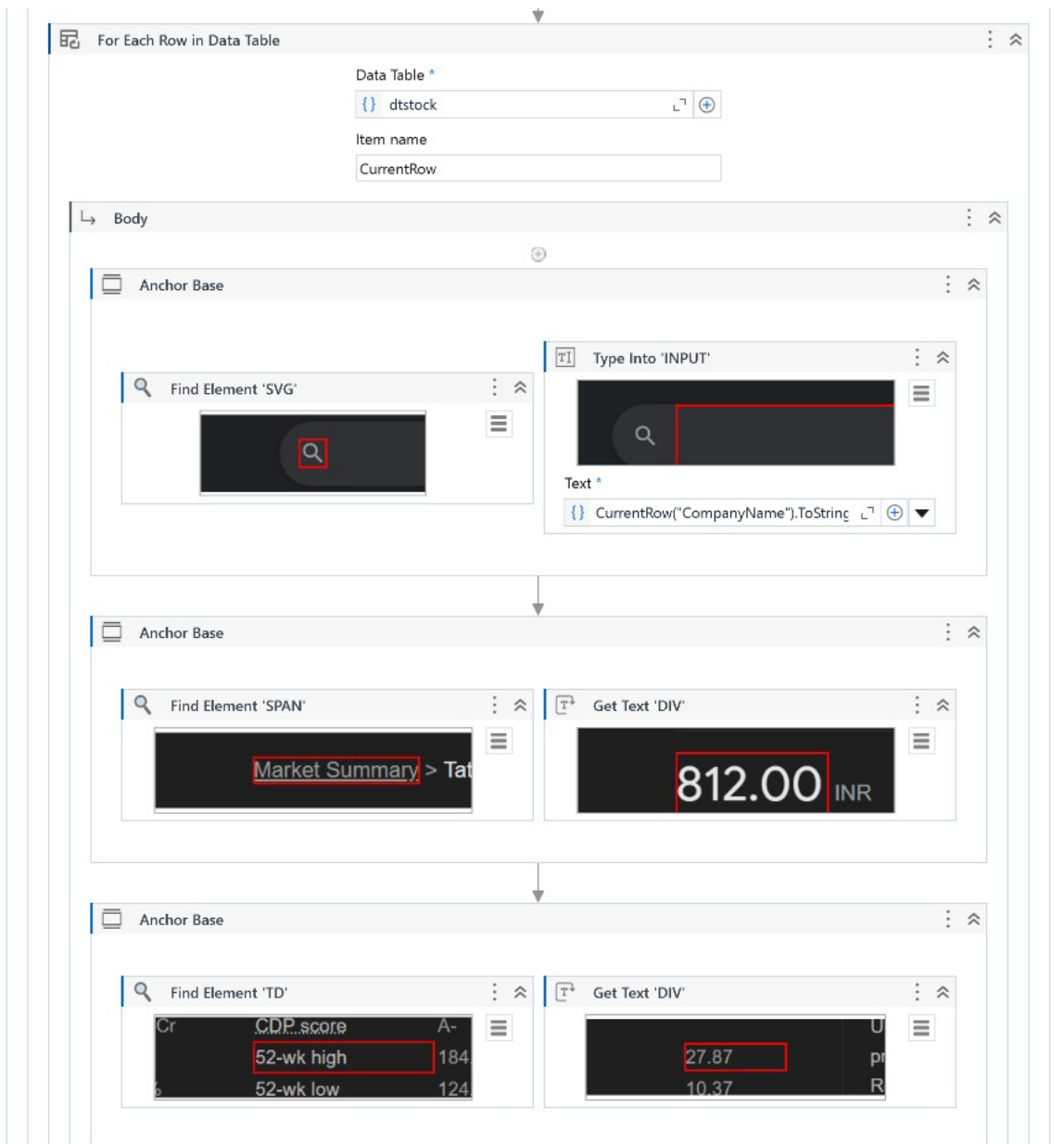
 dtprice 

⌵

⊕

⊕

⊕





	A	B	C	D	E	F	G	H
1	CompanyN	Price	Price Variations					
2	tata steel	139.58	Open142.00High142.49Low139.06					
3	NVIDIA Cor	147.01	Open141.32High147.13Low140.99					
4	Tesla Inc	346	Open335.76High347.38Low332.75					
5	Zomato Ltc	270.02	Open271.94High272.70Low267.66					
6	UiPath Inc	12.76	Open12.35High12.79Low12.32					
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