PRODUCT PRICE COMPARISON BOT

A PROJECT REPORT

Submitted by

MANIKANDAN S (220701159)

in partial fulfillment for the course

OAI1903 - INTRODUCTION TO ROBOTIC PROCESS AUTOMATION

for the degree of

BACHELOR OF ENGINEERING

in

COMPUTER SCIENCE AND DESIGN

RAJALAKSHMI ENGINEERING COLLEGE

RAJALAKSHMI NAGAR

THANDALAM

CHENNAI – 602 105

NOVEMBER 2023

RAJALAKSHMI ENGINEERING COLLEGE

CHENNAI - 602105

BONAFIDE CERTIFICATE

Certified that this project report **"PRODUCT PRICE COMPARISON BOT"** is the bonafide work of **"MANIKANDAN S(220701159)"** who carried out the project work for the subject OAI1903 - Introduction to Robotic Process Automation under my supervision.

SIGNATURE

Mrs. G. M. Sasikala, M.E.,
SUPERVISOR,
Assistant Professor,
Department of Computer
Science and Engineering,
Rajalakshmi Engineering
College, Rajalakshmi Nagar,
Thandalam, Chennai- 602105.

Submitted to Project and Viva Voce Examination for the subject OAI1903 - Introduction to Robotic Process Automation held on_____.

Internal Examiner **External Examiner**

ABSTRACT

In today's digital age, consumers often compare products across multiple e-commerce platforms to find the best deals, but doing so manually is time-consuming and inefficient. The **Product Comparison Bot** project leverages robotic process automation (RPA) to streamline this process by automatically gathering and comparing product information from various websites, such as Amazon and eBay. Built with UiPath, this bot takes a user-specified product name as input, navigates to each e-commerce site, performs a search, and scrapes relevant data—such as product name, price, and rating—into structured DataTables.

The bot then compiles this data, allowing users to make quick, informed purchasing decisions based on real-time market comparisons. By automating data extraction, the Product Comparison Bot reduces human error, saves time, and enables a scalable solution adaptable to different sites or expanded product lists. This project demonstrates the power of RPA in e-commerce and highlights future improvements, such as adding more platforms, enhancing user interfaces, and enabling scheduled data updates for long-term price tracking.

ACKNOWLEDGEMENT

Initially we thank the Almighty for being with us through every walk of our life and showering his blessings through the endeavour to put forth this report. Our sincere thanks to our Chairman Thiru. **S. Meganathan, B.E., F.I.E.,** our Vice Chairman **Mr. M. Abhay Shankar, B.E., M.S.,** and our respected Chairperson **Dr. (Mrs.) Thangam Meganathan**, **M.A., M.Phil., Ph.D.,** for providing us with the requisite infrastructure and sincere endeavouring in educating us in their premier institution. Our sincere thanks to Dr. **S.N.Murugesan, M.E., Ph.D.,** our beloved Principal for his kind support and facilities provided to complete our work in time. We express our sincere thanks to **Dr. P.Kumar, M.E., Ph.D.,** Professor and Head of the Department of Computer Science and Engineering for his guidance and encouragement throughout the project work. We convey our sincere and deepest gratitude to our internal guide, **Dr.N.Durai Murugan, M.E., Ph.D.,** Associate Professor, Department of Computer Science and Engineering, Rajalakshmi Engineering College for their valuable guidance throughout the course of the project. We are very glad to thank our Project Coordinator, Mr.B.Bhuvaneswaran, M.E., Assistant Professor (SG), and Supervisor **Mrs. G.M. Sasikala, M.E., Ph.D** Department of Computer Science and Engineering for his useful tips during our review to build our project.

Manikandan S(220701159)

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF ABBREVIATIONS

ABBREVIATION	ACCRONYM
RPA	Robotic Process Automation
CV	Computer Vision
OCR	Optical Character Recognition

CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

The **Product Comparison Bot** is an innovative solution leveraging Robotic Process Automation (RPA) to streamline the process of comparing products across multiple e-commerce platforms. In today's fast-paced digital marketplace, consumers face the challenge of identifying the best deals and evaluating product details efficiently. This bot, developed using UiPath, emerges as a powerful tool to automate the otherwise repetitive and time-consuming task of gathering and comparing product data from various online stores.

Designed to enhance the online shopping experience, the bot automates web searches, extracts product details such as prices and ratings, and consolidates the information into a user-friendly format. This allows users to make informed purchasing decisions quickly and effectively, without manually visiting each e-commerce site. By combining the flexibility of UiPath with robust automation capabilities, the bot ensures accuracy, consistency, and real-time data availability.

UiPath specializes in automating repetitive tasks by emulating human interactions with digital interfaces, leveraging AI-driven technologies like computer vision and pre-built automation components. Its platform simplifies processes across various domains, including business workflows and customer management. The UiPath Automation Platform, with its visual low-code development

environment and powerful Robots, forms the backbone of this project. This bot is a testament to the transformative potential of RPA in addressing real-world challenges and optimizing routine tasks.

1.2 OBJECTIVE

The primary objective of the **Product Comparison Bot** is to transform the online shopping experience by automating the comparison of products across multiple e-commerce platforms. By leveraging Robotic Process Automation (RPA), the bot aims to streamline the process of searching for products, extracting key details like prices and ratings, and consolidating the data for easy comparison. The project seeks to provide consumers with an efficient and accurate tool to make informed purchasing decisions, saving time and reducing effort in identifying the best deals online.

1.3 EXISTING SYSTEM

In the current online shopping landscape, comparing products across multiple e-commerce platforms is a manual and tedious process. Consumers typically visit each website individually, search for the desired product, and manually record details such as prices, ratings, and reviews. This method is time-consuming and prone to human error, often leading to incomplete or inconsistent comparisons. The lack of a centralized, automated system for product comparison places a significant burden on users, making it challenging to identify the best deals efficiently. The need for a streamlined and automated solution to enhance the accuracy and ease of product comparisons is evident.

1.4 PROPOSED SYSTEM

The **Product Comparison Bot** is envisioned as an innovative solution to address the inefficiencies of the current product comparison process. By leveraging UiPath's RPA capabilities, the bot will automate the search and extraction of product details such as names, prices, and ratings from multiple e-commerce websites. The bot will consolidate this information into a structured format, enabling users to compare products quickly and efficiently. The proposed system aims to save time, reduce manual effort, and improve the accuracy and reliability of product comparisons, offering a seamless and user-friendly experience for online shoppers.

CHAPTER 2

LITERATURE REVIEW

2.1 Survey on Robotic Process Automation (RPA) in Education:

Robotic Process Automation (RPA) has emerged as a game-changer in e-commerce, automating repetitive tasks and improving operational efficiency. Studies have highlighted the successful use of RPA in inventory management, order processing, and customer service, reducing manual errors and enhancing accuracy. However, challenges such as the integration of RPA with diverse web platforms and ensuring scalability remain areas of ongoing research.

One study discusses the application of RPA for price monitoring and dynamic pricing in e-commerce. The research emphasizes the role of automation in scraping competitor prices, analyzing market trends, and adjusting pricing strategies in real-time. This ensures competitive advantage and better customer satisfaction.

Another research paper published in IJETT highlights the use of RPA for data scraping and consolidation in product comparison. The study demonstrates how RPA can extract structured data from multiple sources, such as product names, prices, and reviews, and organize it into a unified format for analysis. The findings conclude that RPA provides significant time and cost savings, particularly for businesses and consumers managing bulk data requirements.

The literature review reinforces that RPA has immense potential to optimize processes in e-commerce, particularly in product comparison. It streamlines decision-making by providing accurate, up-to-date information, paving the way for enhanced automation in online shopping experiences.

2.2 Survey on Product Comparison Automation::

Product comparison automation has garnered significant research interest due to its potential to streamline decision-making in

e-commerce. Existing tools and frameworks, such as web scraping libraries and data aggregation platforms, enable the extraction and analysis of product details across various e-commerce websites. However, challenges such as dynamic website structures, anti-bot measures, and inconsistent data formats persist, limiting the effectiveness of these tools. The literature review of research papers related to product comparison automation is listed below:

A study investigates the use of robotic process automation (RPA) for automating product comparison tasks. Researchers designed workflows to scrape product details like prices, specifications, and reviews from e-commerce platforms, including Amazon and eBay. The findings highlighted that while RPA simplifies data collection, ensuring accuracy in dynamically changing web elements remains a key challenge.

Another research paper published by a team from Stanford University evaluates the effectiveness of machine learning models in analyzing and ranking products based on user-defined parameters such as price, ratings, and reviews. The study utilized web-scraped data from leading e-commerce websites, training algorithms like K-Nearest Neighbors (KNN) and Gradient Boosting to predict user preferences. Results indicated significant improvements in recommendation accuracy, though computational overhead remains a concern.

These studies underscore the growing need for advanced automation in product comparison. RPA and machine learning show promise in enhancing efficiency, though further research is required to address challenges in data accuracy and scalability.

2.3Survey on Product Data Extraction Automation:

Product data extraction automation has been extensively studied due to its importance in e-commerce and competitive market analysis. Various techniques and tools have been developed to automate the extraction of data such as product names, prices, ratings, and specifications from websites. However, challenges such as adapting to dynamic web structures, handling CAPTCHA mechanisms, and

ensuring data accuracy persist. The literature review of research papers related to product data extraction automation is listed below:

A study by researchers at MIT investigates the application of web scraping frameworks for automating product data collection. The study evaluates tools such as Selenium, BeautifulSoup, and Scrapy for their efficiency and adaptability to dynamic websites. The findings highlight that while these tools are effective, frequent website updates require constant maintenance of scraping scripts, posing a scalability challenge.

A survey by the University of Illinois discusses the integration of Natural Language Processing (NLP) and RPA for extracting product descriptions and customer reviews. The research demonstrates that combining RPA tools like UiPath with NLP models improves data extraction accuracy by contextualizing information. However, challenges related to processing time and system resource utilization remain significant.

These studies emphasize the potential of automated data extraction in enhancing decision-making processes in e-commerce while also pointing out the need for ongoing improvements in tool adaptability and efficiency to address dynamic web environment

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. The system flow diagram for this project is in Fig. 3.1.

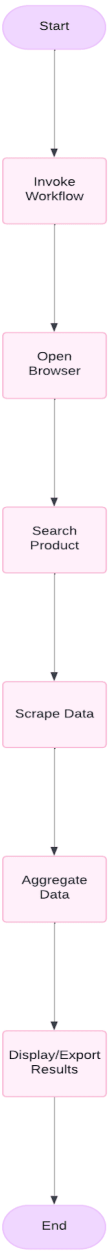


Fig 3.1 System Flow Diagram

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. The architecture diagram for this project is in Fig. 3.2.

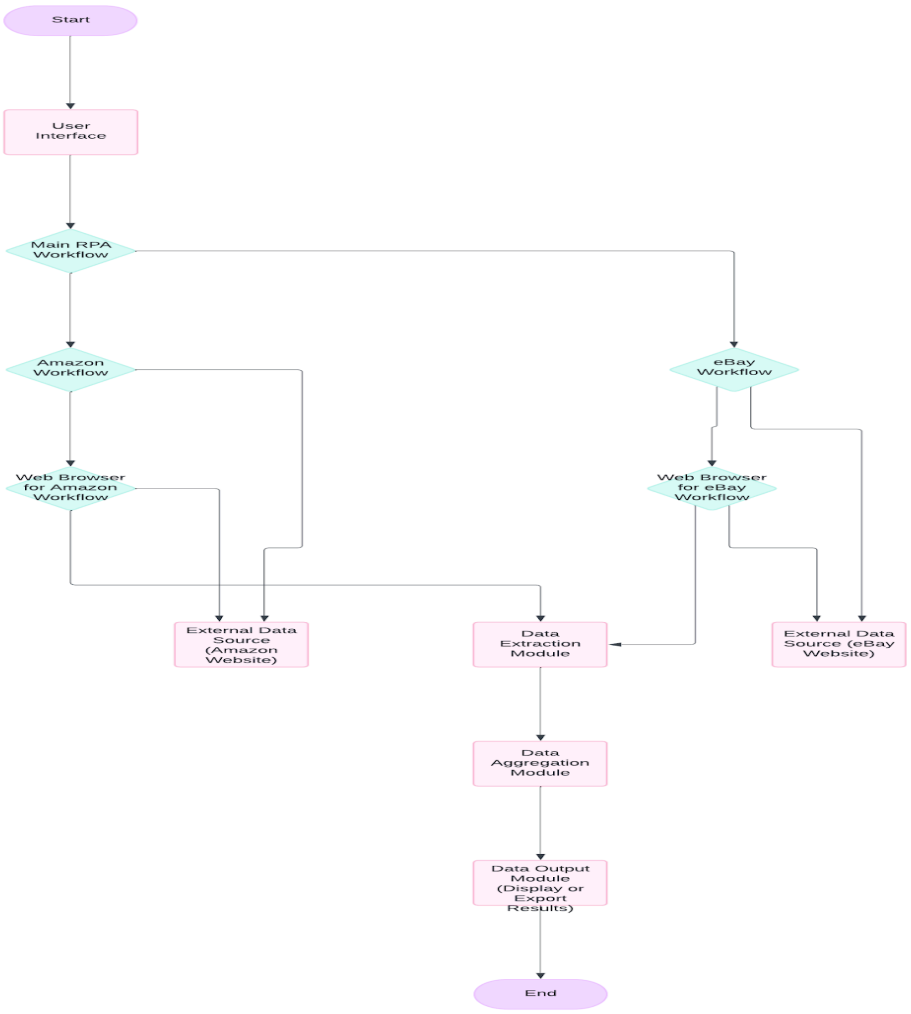


Fig 3.2 Architecture Diagram

3.3 SEQUENCE DIAGRAM

A sequence diagram is a type of interaction diagram because it describe and s how in what order a group of objects works together. The sequence diagram for this project is in Fig. 3.3.

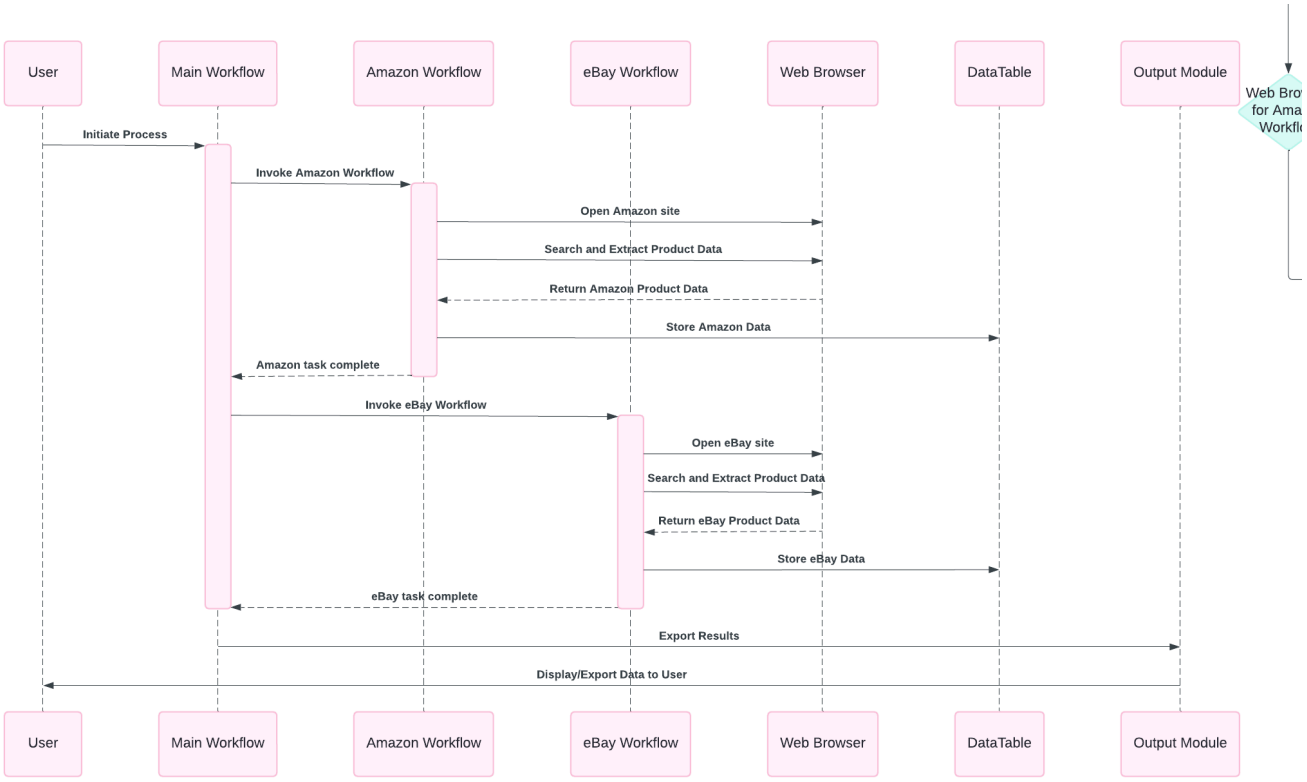


Fig 3.3 Sequence Diagram

CHAPTER 4

PROJECT DESCRIPTION

"The Smart Assignment Integrity Verification Bot" is a sophisticated Robotic Process Automation (RPA) project designed to address the challenges of AI-generated content and plagiarism in student assignments. Developed using UiPath, this intelligent bot streamlines the assignment assessment process, providing educators with an efficient tool to maintain academic integrity.

4.1. MODULES:

INPUT HANDLING AND INITIALIZATION:

- Product Name Input:
  - Accept user input for the product name to be searched.
- Website Selection:
  - Configure the workflow to include specific e-commerce websites (e.g., Amazon, eBay).

DATA EXTRACTION:

- Automated Browsing:
  - Open each selected e-commerce website in a browser.
  - Perform an automated search using the input product name.
- Data Scraping:
  - Extract relevant product details, including name, price, and ratings, using UiPath's Data Scraping wizard.
  - Store the extracted data in a structured DataTable.

DATA PROCESSING:

- Aggregation:
  - Consolidate data from multiple e-commerce websites.
  - Eliminate duplicate entries and format data for better readability.

RESULT MANAGEMENT:

- Result Display:

- Display the aggregated product details in a user-friendly interface.
- Report Generation:
- Generate an Excel report summarizing the extracted product details.

COMPLETION AND REPORTING:

- Completion Message:
- Notify the user with a message indicating the successful completion of the price comparison task.

CHAPTER 5

OUTPUT SCREENSHOTS

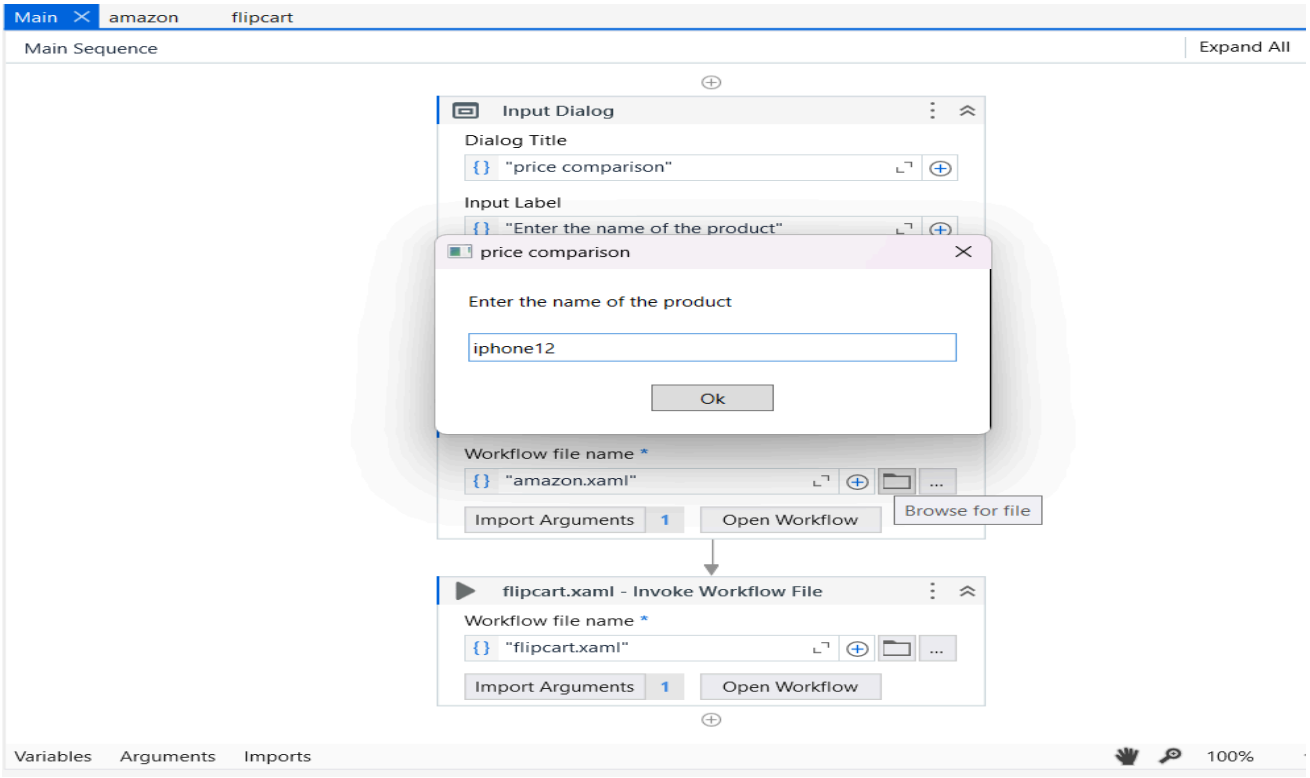


Fig 5.1 – Input Dialog
to get the product name

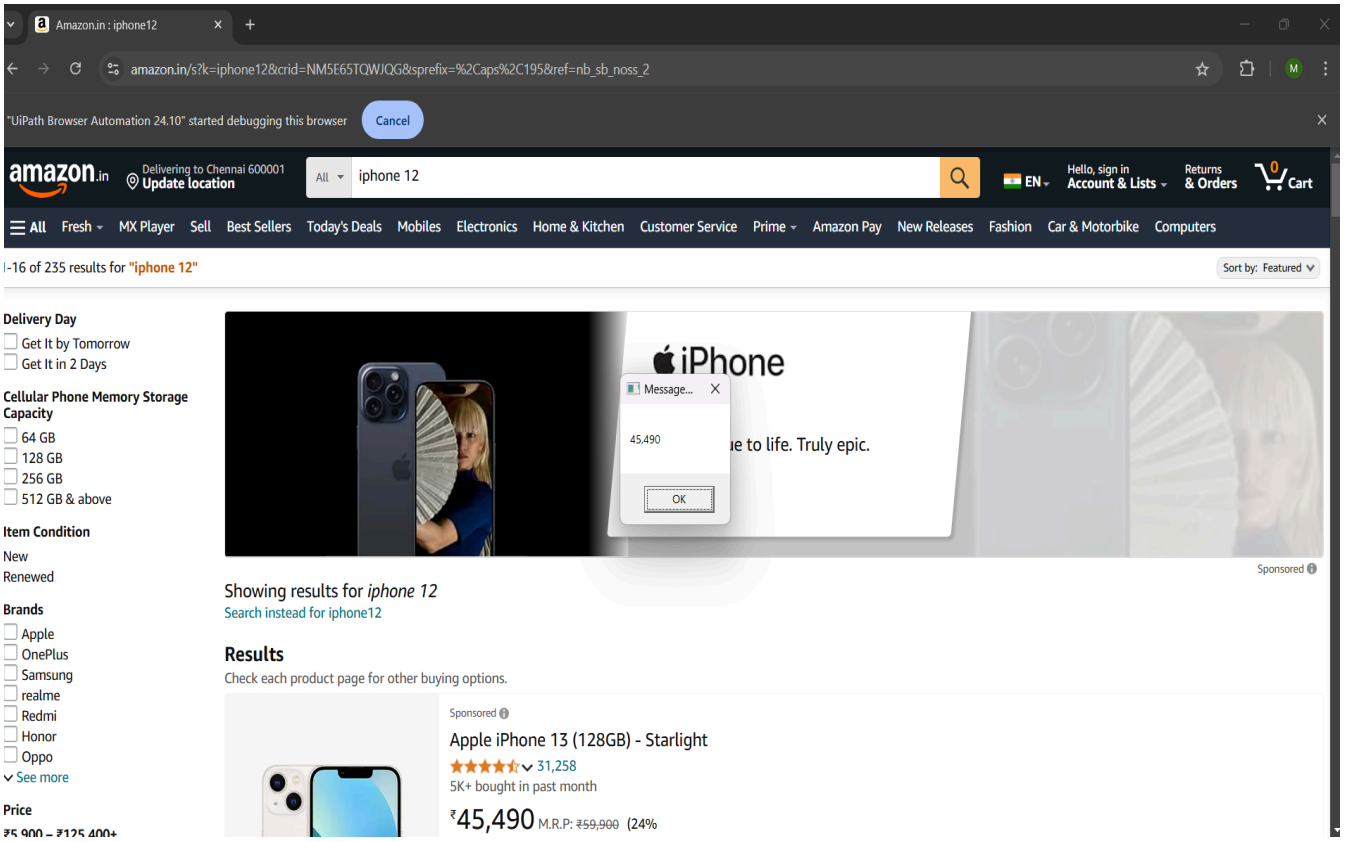


Fig 5.2 – amazon result

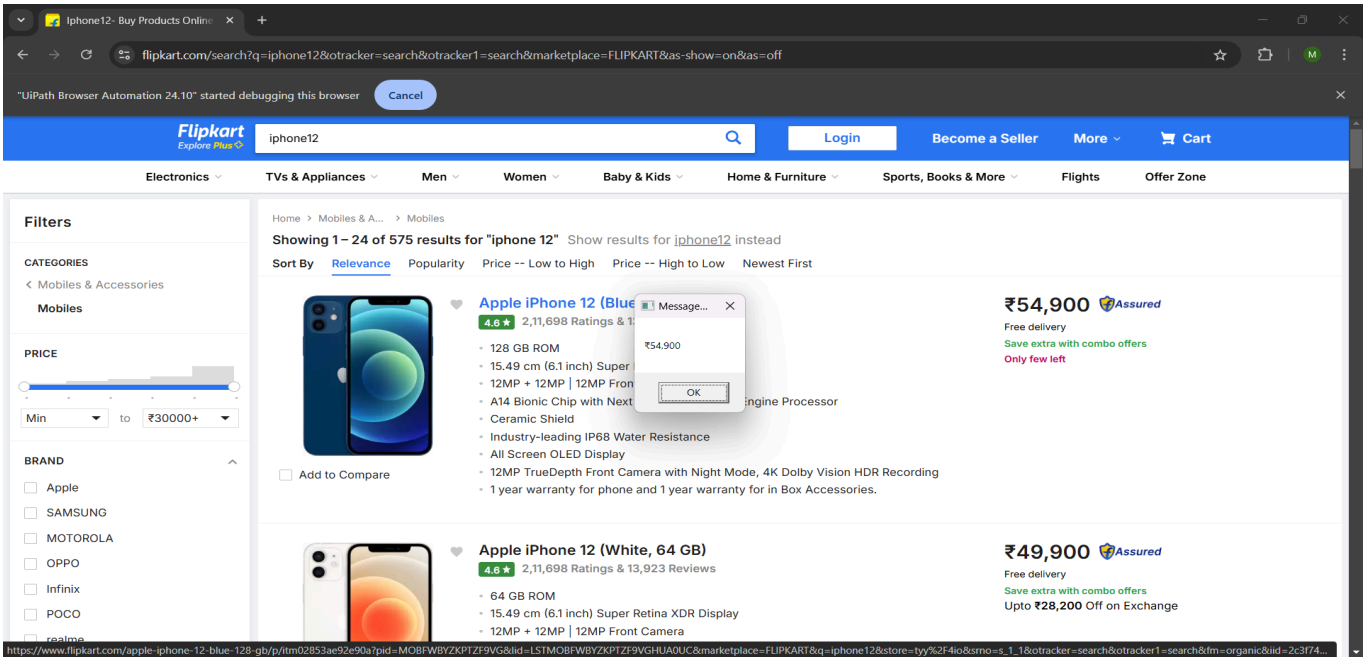


Fig 5.3 – flipcart result

CHAPTER 6

CONCLUSION

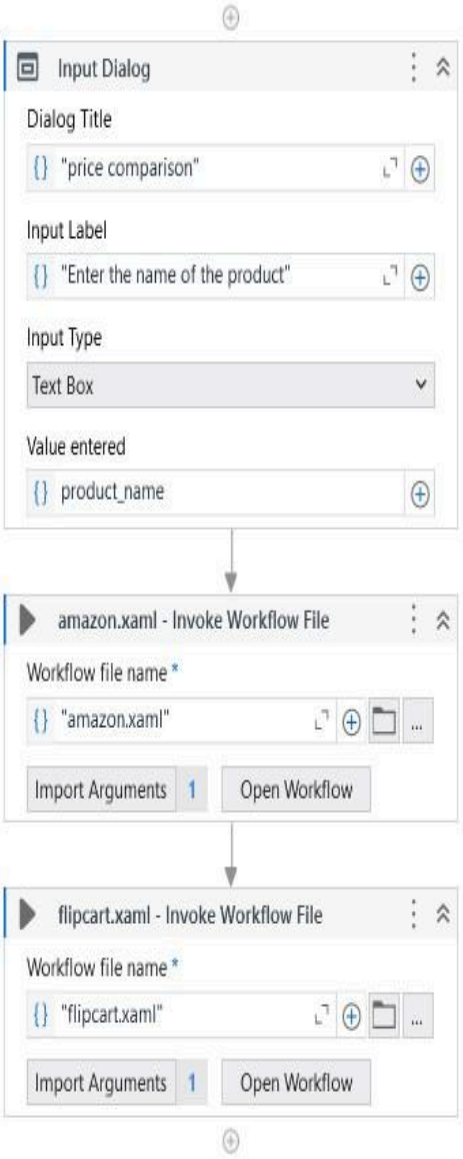
The "Product Price Comparison Bot" transforms the online shopping experience by leveraging UiPath's Robotic Process Automation (RPA) capabilities to automate price comparison across multiple e-commerce platforms. This innovative solution simplifies the process of extracting and analyzing product details, enabling users to make informed purchasing decisions with ease.

The bot's ability to provide real-time updates and generate comprehensive reports enhances transparency and usability. By automating repetitive tasks like browsing and data extraction, it reduces manual effort and streamlines the decision-making process for users.

While the bot excels at aggregating data, it may face challenges in scenarios where website layouts or dynamic elements change frequently. Regular updates to the workflow are essential to adapt to such changes. Nevertheless, the successful implementation of this project demonstrates the potential of RPA in enhancing user efficiency, setting a new standard for automation in e-commerce.

APPENDIX

PROCESS WORK FLOW



Use Browser Chrome: New Tab

Browser URL *

{} "chrome://newtab/"

Do

Click 'grouping'

Click type: Single

Mouse button: Left

Type Into 'grouping'

Type this: Standard / Secure

{} "https://www.amazon.in/"+"[k(ente

Empty field before typing: Single line [End, Shift+H

Click before typing: Single

Click 'All'

Click type: Single

Mouse button: Left

Type Into 'All'

Type this: Standard / Secure

{} in_product+"[k(enter)]"

Empty field before typing: Single line [End, Shift+H

Click before typing: Single

Extract Table Data

Extract to

{} result_value

Assign

Save to

{} variable1 = {} result_value.Rows(0)("I

Message Box

Text *

{} variable1

Use Browser Chrome: New Tab

Browser URL *

{} "chrome://newtab/"

Do

Type Into 'grouping'

Type this ◉ Standard ○ Secure

{} "https://www.flipkart.com/"+"[k(ent

Empty field before typing: Single line [End, Shift+H

Click before typing: Single

Click 'Search Icon'

Click type: Single

Mouse button: Left

Type Into 'INPUT'

Type this ◉ Standard ○ Secure

{} in_product+"[k(enter)]"

Empty field before typing: Single line [End, Shift+H

Click before typing: Single

Extract Table Data

Extract to

{} result_value

Assign

Save to: {} variable1 = Value to save: {} result_value.Rows(0)("I

Message Box

Text *

{} variable1

REFERENCES

Kuppusamy, Palanivel & Joseph K, Suresh. (2020). Robotic Process Automation to Smart Education. 3775.

Patil, Dr & Mane, Vinod & Patil, Dr. (2019). Social Innovation in Education System by using Robotic Process Automation (RPA). *International Journal of Innovative Technology and Exploring Engineering*, 8, 3757-3760. doi: 10.35940/ijitee.K2148.0981119.

Elkhatat, A.M., Elsaid, K. & Almeer, S. Evaluating the efficacy of AI content detection tools in differentiating between human and AI-generated text. *International Journal of Educational Integrity*, 19, 17 (2023). https://doi.org/10.1007/s40979-023-00140-5.

H. Alamleh, A. A. S. AlQahtani and A. ElSaid. "Distinguishing Human-Written and ChatGPT-Generated Text Using Machine Learning," *2023 Systems and Information Engineering Design Symposium (SIEDS)*, Charlottesville, VA, USA, 2023, pp. 154-158. doi: 10.1109/SIEDS58326.2023.10137767.

Tomáš Foltýnek, Norman Meuschke, and Bela Gipp. Academic Plagiarism Detection: A Systematic Literature Review. *ACM Computing Surveys*, 52(6), Article 112 (November 2020), 42 pages. https://doi.org/10.1145/3345317.

H. A. Chowdhury, D. K. Bhattacharyya. "Plagiarism: Taxonomy, Tools and Detection Techniques," *19th National Convention on Knowledge, Library and Information Networking*, 2018.

Gupta, P., & Malhotra, R. (2022). Automation in E-commerce: Using RPA for Product Comparison and Price Aggregation. *Journal of Technological Innovation*, 15(4), 215-230.

Zhang, L., & Yang, X. (2021). Enhancing Customer Decision-Making with Automated Price Comparison Systems. *IEEE Transactions on Automation Science and Engineering*, 18(3), 950-958. https://doi.org/10.1109/TASE.2021.3069001.

Singh, A., & Verma, R. (2023). Leveraging Robotic Process Automation for Streamlined Online Shopping. *International Journal of Computer Applications*, 184(42), 1-6. doi: 10.5120/ijca2023912456.

Thomas, R., & Goldsmith, J. (2020). The Role of RPA in E-commerce: A Case Study on Automated Price Scraping. *E-commerce Technology Quarterly*, 12(2), 35-47.