

INNOVENTRY TASK AUTOMATION BOT

A PROJECT REPORT

Submitted by

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in partial fulfillment for the course

OAI1903 - INTRODUCTION TO ROBOTIC PROCESS AUTOMATION

for the degree of

BACHELOR OF ENGINEERING

in

COMPUTER SCIENCE AND ENGINEERING

RAJALAKSHMI ENGINEERING COLLEGE

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NOVEMBER 2024

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BONAFIDE CERTIFICATE

Certified that this project report “ **Jewellery Stock Retrieval And Price Estimation Bot**” is the bonafide work of ” **RISHI BALA P(220701224)** ” who carried out the project work for the subject OAI1903-Introduction to Robotic Process Automation undermy supervision.

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Introduction to Robotic Process Automation held on_____.

ABSTRACT

“This Robotic Process Automation (RPA) project aims to optimize the jewelry shop pricing process by automating data retrieval and calculation tasks. Using UiPath Studio, the bot extracts jewelry stock details, such as item descriptions and weights, from Excel sheets. It then fetches real-time gold and silver prices by scraping trusted websites or interacting with APIs.

The bot calculates the total value of each item by combining the weight with the current metal prices, ensuring accurate and up-to-date pricing. Key activities include Excel data manipulation, web scraping, and logic-based computations, with integrated error handling for seamless execution.

By automating manual processes, the solution reduces errors, saves time, and enhances operational efficiency. It enables competitive pricing and improves customer trust through accurate valuations. This project exemplifies how RPA can transform routine business processes, delivering efficiency, scalability, and a foundation for future automation enhancements.”

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 guides, **Ms. Roxanna Samuel, M.E.**, Assistant Professor (SG), **Ms. U.Farjana, M.E.**, Assistant Professor and **Ms. S.Vinothini, M.E.**, Department of Computer Science and Engineering for their valuable guidance throughout the course of the project. We are very glad to thank our Project Coordinators, **Dr. P.Revathy, M.E., Ph.D.**, Professor, **Dr. N.Durai Murugan, M.E., Ph.D.**, Associate Professor, and **Mr. B.Bhuvaneswaran, M.E.**, Assistant Professor (SG), Department of Computer Science and Engineering for their useful tips during our review to build our project.

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LIST OF ABBREVIATION

Abbreviation	Acronym
RPA	Robotic Process Automation
API	Application Programming Interface
UI	User Interface
CRUD	Create Read Update Delete
SMTP	Simple Mail Transfer Protocol

CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

- The jewelry industry relies on accurate pricing, which is heavily influenced by fluctuating market rates of precious metals like gold and silver. Traditional pricing methods involve manual data extraction, market rate verification, and calculations—processes that are both time-consuming and prone to human error. To address these challenges, the proposed Robotic Process Automation (RPA) project introduces a streamlined, automated solution for pricing jewelry.
- Using UiPath Studio, the automation process begins by extracting jewelry stock data from Excel sheets. These sheets typically contain critical details such as item names, weights, and categories. The bot then fetches real-time market rates for gold and silver, either by scraping data from trusted financial websites or by calling APIs that provide accurate and up-to-date metal prices. With this data, the bot calculates the total value of each jewelry item, ensuring pricing reflects the latest market trends.
- One of the most significant advantages of this approach is the reduction of human error, as the bot consistently performs accurate calculations. Additionally, automating this repetitive task saves time for shop employees, allowing them to focus on customer engagement and other value-added activities. The system also incorporates error-handling mechanisms, ensuring smooth operation and minimal disruptions.
- This solution is scalable and adaptable, enabling the jewelry shop to handle fluctuating inventories and changing market conditions with ease. The automation enhances customer trust by providing transparent and accurate pricing, ultimately improving the shop's operational efficiency and reputation.
- The project highlights the potential of RPA in transforming traditional business processes. By automating a critical function like pricing, the jewelry shop can achieve greater accuracy, efficiency, and customer satisfaction, demonstrating the value of technology-driven innovation in the retail sector.

OBJECTIVE:

The objective of this Robotic Process Automation (RPA) project is to revolutionize the pricing process in the jewelry industry by automating key tasks that are traditionally manual, error-prone, and time-consuming. This automation aims to ensure the jewelry shop's pricing reflects real-time market trends while minimizing human effort and errors.

The project begins with the automation of data extraction from Excel sheets provided by the shop. These sheets contain crucial inventory information such as jewelry type, weight, and design details. The next step is the retrieval of real-time market prices for precious metals like gold and silver. This is accomplished either by scraping data from reliable financial websites or by integrating APIs that provide current metal rates.

Once the relevant data is collected, the RPA bot calculates the accurate pricing for each jewelry piece based on its weight and the latest market rates. This ensures precise and transparent pricing that is both consistent and customer-friendly. By automating this process, the shop eliminates the risks of manual miscalculations and inconsistencies in pricing.

The ultimate goal of the project is to enhance operational efficiency and accuracy. Automating these repetitive tasks allows the shop's employees to focus on more strategic and customer-oriented activities, such as sales and personalized service. Additionally, the RPA system is scalable and can adapt to changes in inventory size and market fluctuations.

By implementing this RPA solution, the jewelry shop will gain a competitive edge, foster customer trust, and streamline its operations. This project demonstrates how modern technologies like RPA can be leveraged to transform traditional retail practices, paving the way for a more efficient, reliable, and innovative future in the jewelry industry.

1.2 EXISTING SYSTEM

The current pricing process in most jewelry shops is primarily manual, relying heavily on human effort and traditional methods to calculate the prices of jewelry items. Typically, the shop staff gathers inventory data from handwritten records or Excel sheets, which include details such as the type of jewelry, weight, and design specifications. Subsequently, the staff manually retrieves market prices for precious metals like gold and silver through internet searches, calls to suppliers, or by consulting daily price sheets.

After obtaining the necessary data, calculations are performed to determine the pricing of each jewelry item. This process often involves using calculators or simple Excel formulas. However, this manual system is prone to several challenges and inefficiencies.

Challenges in the Existing System:

1. **Human Error:** Manual data entry and calculations can lead to mistakes, resulting in inaccurate pricing that can either overcharge or undercharge customers.
2. **Time-Consuming:** The process of gathering data, performing calculations, and verifying prices is slow, particularly during busy hours.
3. **Lack of Real-Time Updates:** Market prices for gold and silver fluctuate frequently. Delays in updating these rates can result in outdated pricing, affecting profitability.
4. **Repetition:** Staff members must repeat similar tasks daily, leading to reduced productivity and employee dissatisfaction.
5. **Scalability Issues:** As inventory size grows, the manual system becomes increasingly cumbersome and challenging to manage efficiently.

The existing system not only demands significant time and effort but also lacks consistency and precision. With the increasing demand for transparency and real-time pricing in the retail sector, the limitations of this traditional approach have become more apparent. These inefficiencies highlight the need for a more automated and robust solution, paving the way for the proposed RPA-based system to address these challenges effectively.

1.3 PROPOSED SYSTEM

The proposed system leverages Robotic Process Automation (RPA) to revolutionize the pricing process for jewelry shops by automating key operations such as data extraction, real-time price retrieval, and pricing calculation. Unlike the manual system, this solution is designed to minimize human intervention, enhance accuracy, and ensure efficiency.

The workflow begins with the bot extracting inventory data from Excel sheets containing details like jewelry type, weight, and design specifications. The system then retrieves the current market prices for gold and silver through trusted financial websites or APIs that provide real-time metal rates. This ensures that the pricing reflects the most up-to-date market trends.

Once the data is gathered, the bot calculates the total price of each jewelry piece by considering its weight, design overhead, and the latest metal prices. These calculated values are automatically updated in a structured Excel sheet or database for record-keeping.

Key Features:

1. **Accuracy and Consistency:** Automated calculations eliminate human errors, providing accurate and consistent pricing.
2. **Real-Time Updates:** Integration with live market data ensures that pricing reflects the latest gold and silver rates.
3. **Efficiency:** Automation significantly reduces the time required for data processing and calculation.
4. **Scalability:** The system can handle large volumes of inventory seamlessly, making it ideal for small to large-scale jewelry businesses.
5. **Ease of Use:** The workflow is designed to be user-friendly, enabling even non-technical staff to operate it effectively.

This RPA-driven solution not only streamlines the pricing process but also enhances customer satisfaction by ensuring transparency and precision. It reduces workload for staff, allowing them to focus on customer service and other critical business areas. The proposed system is a forward-thinking approach that combines technology and business needs, aligning with modern operational standards.

CHAPTER 2

LITERATURE REVIEW

The evolution of Robotic Process Automation (RPA) has had a profound impact on various industries, facilitating the automation of routine and repetitive tasks that were traditionally performed by human workers. Its applicability extends across different sectors such as healthcare, finance, retail, and manufacturing. In the retail industry, particularly for jewelry businesses, the automation of pricing and inventory management tasks offers substantial opportunities for operational efficiency. This literature review delves into existing research surrounding the applications of RPA in retail, with a focus on inventory management, dynamic pricing strategies, and the integration of real-time market data. Additionally, it explores how these systems can help optimize workflows and improve accuracy by automating data collection, calculation, and reporting.

Robotic Process Automation in Retail

RPA has gained considerable attention in the retail industry due to its potential to reduce manual effort, lower operational costs, and improve accuracy. It operates by using bots to perform tasks that involve interacting with digital systems in a way that mimics human actions. According to a report by van der Aalst et al. (2018), RPA is particularly effective in sectors like retail, where large volumes of repetitive tasks, such as data entry and inventory tracking, are required. This enables businesses to save time, mitigate errors, and allocate resources more effectively. For jewelry businesses, RPA can be applied to automate pricing calculations, inventory management, and other essential operations that contribute to the smooth running of the business.

In jewelry retail, one of the main applications of RPA is in automating pricing processes. Jewelry prices, especially those involving gold, silver, and precious gemstones, can fluctuate frequently due to changes in market conditions. As such, keeping track of these changes manually is a time-consuming and error-prone task. With RPA, businesses can automate the retrieval of real-time metal prices from trusted financial sources, enabling them to calculate jewelry prices accurately and promptly. According to Lacity and Willcocks (2015), RPA can integrate seamlessly with existing retail systems, enabling real-time access to pricing data and reducing the chances of price discrepancies.

Real-Time Market Data Integration

In the jewelry industry, pricing is highly dependent on fluctuating commodity values such as the prices of gold and silver. Integrating real-time market data is crucial for accurate price determination, particularly for products where pricing adjustments are often required based on changes in the cost of raw materials. Previous studies have shown that data from external sources, such as market APIs or web scraping from financial websites, can be effectively integrated into RPA systems to automate real-time data fetching and calculations. Bukhari et al. (2020) suggest that combining RPA with real-time market data can significantly reduce the time spent on

manually checking metal prices and updating inventory prices.

For instance, jewelry shops can use RPA bots to retrieve the current market price for gold and silver from reliable financial websites or APIs. These bots can then calculate the pricing for jewelry items based on their weight, design, and the current prices of the metals used. By using RPA to automate this process, the jewelry business can ensure its pricing remains competitive and up-to-date without needing to employ additional resources or spend time on manual calculations.

Another benefit of integrating real-time data is the consistency it offers. In the absence of RPA, businesses often rely on spreadsheets, which may not always be up-to-date. As a result, they may miss crucial market fluctuations that could impact their pricing strategies. However, RPA allows businesses to automate updates, ensuring that all data is current and accurate. By integrating market APIs, jewelry shops can get accurate pricing data every time, reducing the risk of pricing discrepancies that could lead to customer dissatisfaction or financial losses.

Applications of RPA in Inventory Management

Inventory management is one of the most critical aspects of any retail business, and jewelry shops are no exception. Jewelry retailers need to ensure their inventory is properly tracked and managed to avoid overstocking or understocking. In many jewelry stores, inventory management often involves dealing with large amounts of data spread across various files and documents. This can lead to errors or delays in updating inventory levels, which can have financial consequences.

The use of RPA in inventory management offers a solution to these challenges. RPA bots can be used to automate the process of extracting information from inventory files, whether they are in the form of Excel sheets, PDFs, or other formats. For example, an RPA bot can be configured to read jewelry stock data from an Excel file, extract key details such as the item description, quantity, and weight, and then update the corresponding database automatically. This eliminates the need for manual data entry, which can be error-prone and time-consuming.

Lu and Huang (2019) demonstrate that the automation of inventory management tasks through RPA not only improves the accuracy of data but also speeds up the entire process. For example, an RPA bot can automatically check the stock levels of particular jewelry items and alert the store manager when stock is running low. This proactive approach ensures that inventory levels are maintained efficiently without requiring constant manual oversight.

Moreover, RPA can also help integrate inventory data with pricing information, enabling jewelry businesses to adjust prices in real time based on changes in stock levels or market conditions. For instance, if the inventory of a particular jewelry item increases or decreases, the RPA bot can be programmed to automatically adjust the price to reflect the supply and demand, optimizing the pricing strategy for the business.

Benefits of RPA in Pricing Accuracy and Operational Efficiency

A significant advantage of RPA in the jewelry business is its ability to eliminate human errors in data handling.

Human intervention, especially in repetitive tasks like pricing calculations, can lead to mistakes that could affect the bottom line. According to research by Willcocks et al. (2015), RPA can significantly reduce the occurrence of such errors by automating data retrieval, calculation, and reporting.

In addition to reducing errors, RPA offers operational efficiency. Since RPA bots can run continuously, they can process large volumes of data much faster than humans. For jewelry businesses, this means that they can process orders, update stock levels, and adjust prices much more quickly. This efficiency is particularly important during peak times when many transactions or pricing updates need to occur simultaneously. RPA ensures that these processes are handled swiftly, without delays or bottlenecks.

Additionally, RPA systems are scalable, making them an ideal solution for jewelry businesses of varying sizes. Whether a jewelry store is a small boutique or a large-scale retailer, RPA can be implemented in a way that meets the specific needs of the business. The scalability of RPA allows businesses to grow without having to worry about the increased operational costs of manual labor.

Challenges in Implementing RPA in Jewelry Retail

Despite the numerous benefits of RPA, implementing the technology in jewelry retail is not without its challenges. One of the primary concerns is the initial cost of implementation, especially for small businesses. While RPA offers significant long-term savings, the upfront costs for setting up the infrastructure and developing bots can be a barrier to entry for some businesses.

Additionally, integrating RPA into existing systems can be complex, especially for jewelry businesses that rely on outdated software or processes. This requires careful planning and customization to ensure that the RPA bots are compatible with the current systems and workflows. Training employees to work alongside the automated processes is another key challenge, as employees need to adapt to the new way of doing things and understand how to use the RPA tools effectively.

CHAPTER 3

SYSTEM DESIGN

SYSTEM FLOW DIAGRAM

This flowchart outlines a system for managing jewelry stock data and updating inventory pricing based on current market values of gold and silver. The process begins with fetching jewelry stock data from Excel sheets. This data contains details about the jewelry pieces, such as their weights and other attributes.

The next step involves gathering real-time market prices for precious metals (gold and silver). A decision point arises where the method of obtaining these prices is determined. There are two possible methods: either scraping data from trusted financial websites or calling an API to retrieve current metal rates. Both methods aim to obtain the latest and most accurate pricing.

Once the real-time prices are retrieved, the total value of each jewelry piece is computed using its weight multiplied by the corresponding metal's current price. After the computation, the system updates and finalizes the pricing information in the inventory system to reflect the latest market rates.

This process ensures that the inventory system maintains accurate and real-time pricing for all jewelry pieces. The flowchart concludes when the updated data is stored in the system, ready for further operations or sales. This automation improves inventory management and pricing accuracy for the jewelry business.

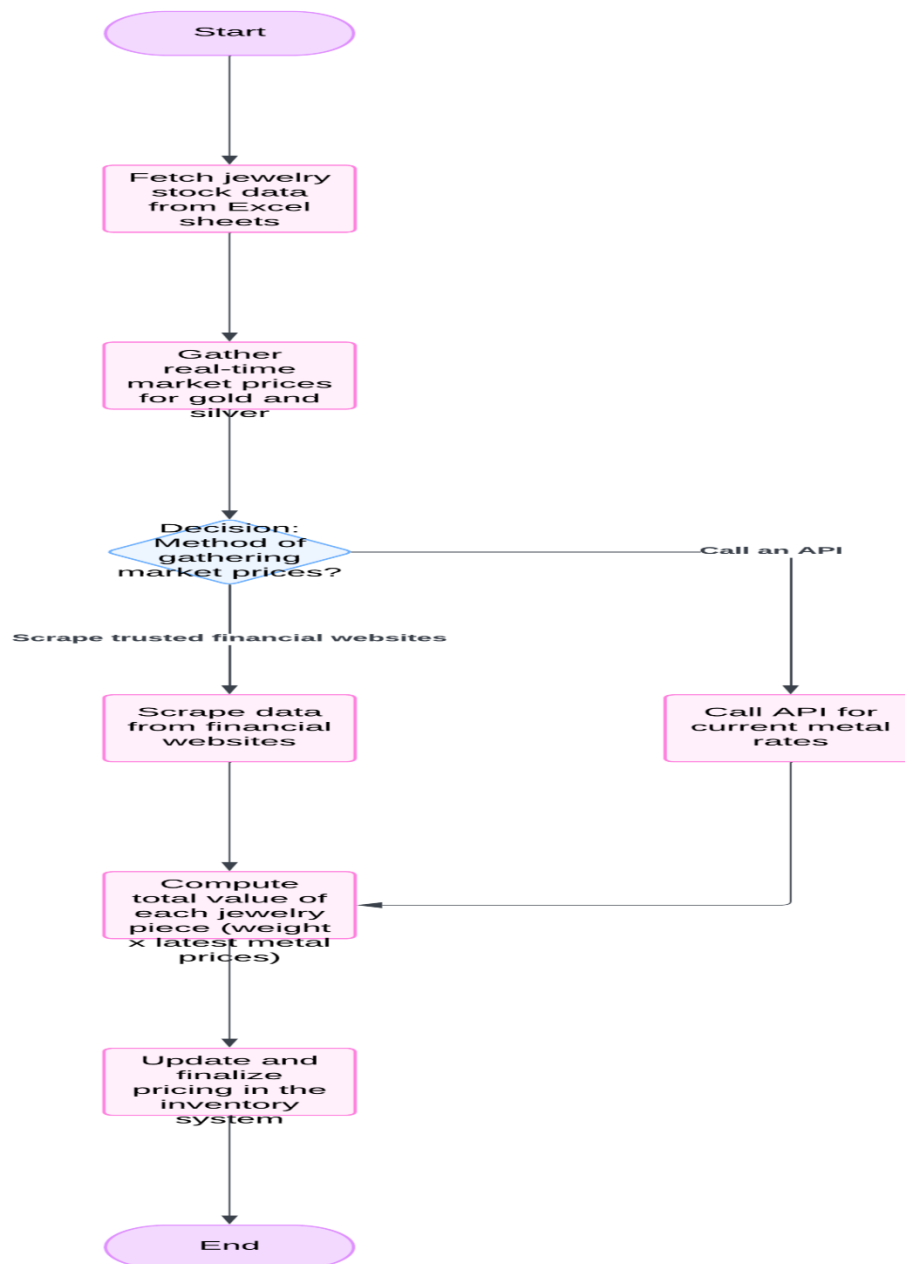


Fig 3.1 Systemflow diagram

3.1 ARCHITECTURE DIAGRAM

This architecture diagram depicts an automated system designed for efficient jewelry pricing using Robotic Process Automation (RPA). The system integrates multiple processes to streamline inventory management and ensure pricing accuracy based on real-time market conditions.

The workflow begins with the RPA system initiating the jewelry pricing operations. It handles two key tasks simultaneously: **fetching jewelry stock data from Excel sheets** and **gathering real-time market prices** for precious metals like gold and silver. The stock data includes critical details such as the weight and type of each jewelry piece.

For collecting real-time market prices, the system provides two options. The first is to scrape trusted financial websites to extract current gold and silver rates, and the second involves calling APIs to retrieve the latest market prices directly. Both methods are designed to provide reliable, up-to-date pricing information, ensuring the system adapts to fluctuations in the market.

Once the stock data and market rates are available, the system computes the total value of each jewelry item by multiplying the weight of the jewelry with the respective market price of the metals it contains. This ensures that each piece of jewelry is accurately valued based on the latest market rates.

The computed values are then used to **update the inventory system**. This step finalizes the pricing for all jewelry items, ensuring that the inventory reflects the most current and accurate pricing information. This automated update eliminates manual intervention, reducing the risk of errors and inconsistencies.

The final phase highlights the key benefits of the system. By leveraging automation, the system ensures accurate pricing, reduces the risk of human error, and significantly saves time for the business. The ability to integrate real-time market data with inventory management ensures that the jewelry business can respond dynamically to market changes. This increases operational efficiency, enhances pricing precision, and ultimately improves decision-making for inventory and sales strategies. Such automation is invaluable for businesses looking to optimize their processes and maintain competitiveness in a fast-paced market.

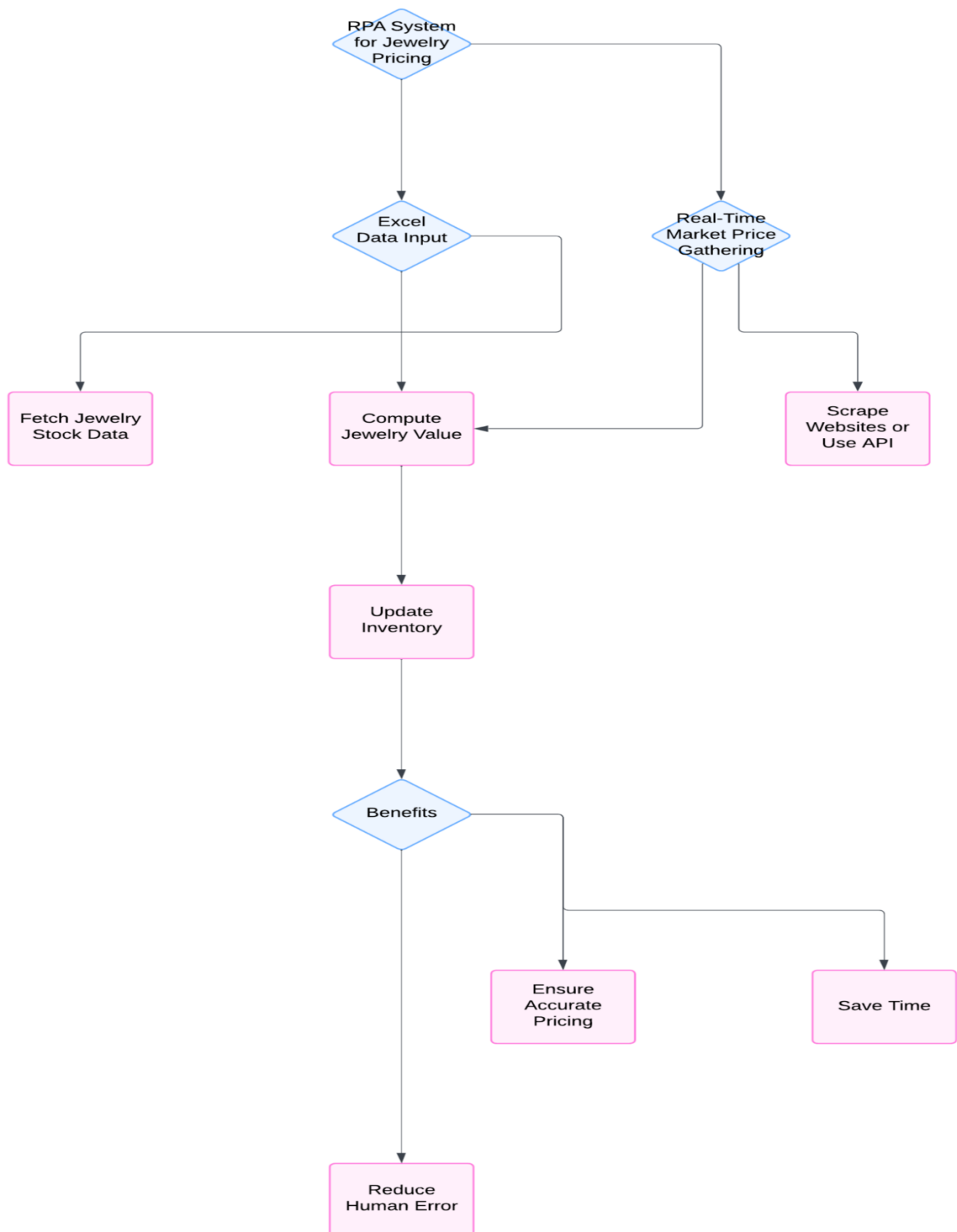


Fig 3.2 Architecture diagram

3.2 SEQUENCE DIAGRAM

This sequence diagram illustrates an automated process for jewelry pricing involving multiple components: the jewelry shop, a bot, an Excel sheet, financial websites, and an API.

The process begins when the jewelry shop initiates the pricing workflow. The bot fetches jewelry stock data from the Excel sheet, and once the data is retrieved, it moves on to gather real-time market prices for precious metals. At this point, the system has two alternatives: it either scrapes trusted financial websites for metal prices or calls an API to retrieve current market rates.

Once the metal prices are obtained through either method, the bot computes the total value of each jewelry piece by combining the retrieved stock data with the real-time prices. Finally, the updated stock pricing is returned to the jewelry shop. This automated sequence ensures accurate, real-time pricing while reducing manual intervention, enhancing efficiency, and maintaining consistency in the pricing process.

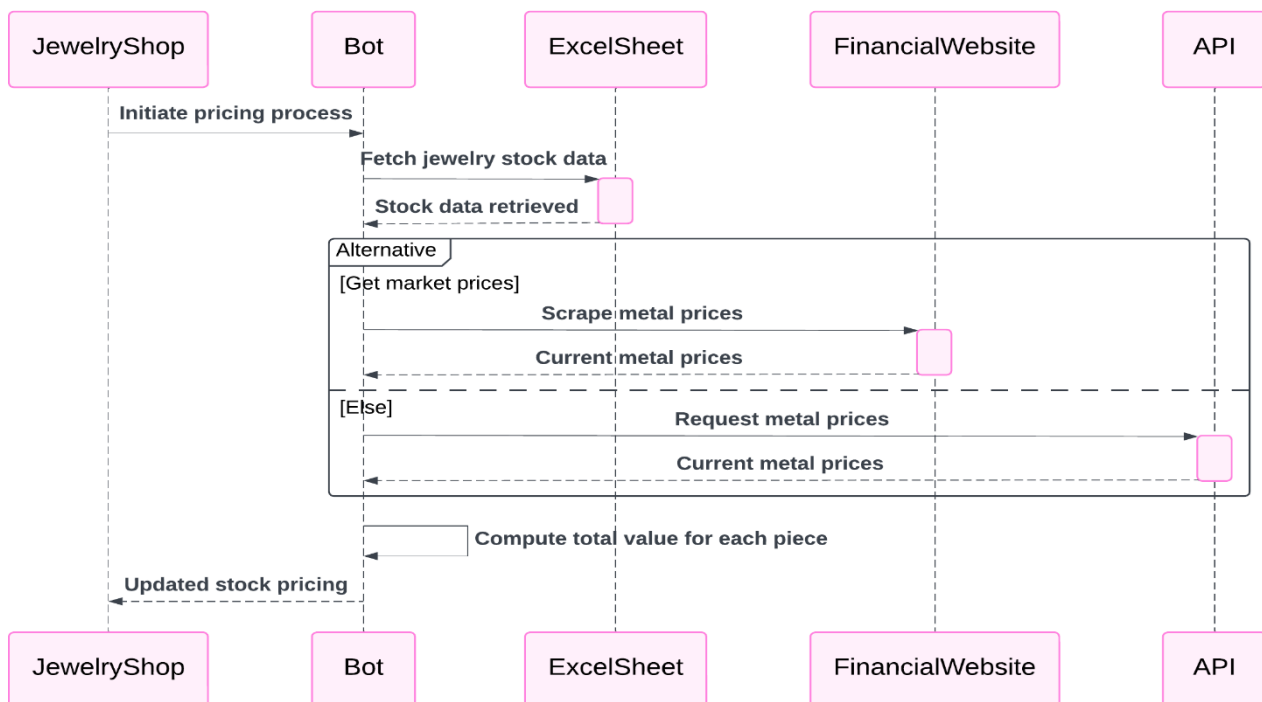


Fig 3.3 Sequence diagram

CHAPTER 4

PROJECT DISCRIPTION

The primary objective of this RPA bot is to automate the jewelry pricing process, ensuring accuracy and efficiency.

The project focuses on:

- Automating the retrieval of jewelry stock data from Excel sheets.
- Fetching real-time prices of gold and silver from financial websites or APIs.
- Calculating jewelry prices based on weight and current metal prices.
- Storing the computed data in Excel files for easy access and reporting.
- Minimizing manual intervention in repetitive processes to reduce errors and save time.

Features and Functionalities

1. **Data Extraction from Excel:**
The bot begins by accessing jewelry inventory details stored in Excel sheets. Key details like item names, weights, and stock quantities are extracted using UiPath activities.
2. **Real-Time Market Price Retrieval:**
Using web scraping or API integration, the bot fetches the latest gold and silver prices from trusted financial platforms. This ensures that calculations are based on up-to-date market data.
3. **Automated Price Calculation:**
The bot computes jewelry prices by combining weight data with real-time metal prices. The calculated results are consistent and free from manual errors.
4. **Data Storage and Reporting:**
The pricing data is written into a new or updated Excel file, providing a clear record for billing, inventory management, or analysis.
5. **Error Handling:**
The bot is equipped with error-handling mechanisms, including retries for failed data retrieval and logs for issues that need manual review.
6. **Scalability:**
The solution is designed to handle varying inventory sizes, accommodating both small-scale and large-scale jewelry businesses.

Implementation Steps

1. **Environment Setup:**
Install UiPath Studio and set up required packages for Excel operations, web scraping, and API integration.
2. **Excel Data Extraction:**
Use the Excel Application Scope and Read Range activities to fetch stock details like jewelry weights and quantities.
3. **Market Price Retrieval:**
 - **Web Scraping:** Use the Open Browser and Get Text activities to extract gold and silver prices from financial websites.
 - **API Integration:** Use the HTTP Request activity to fetch real-time metal prices from an API.
4. **Price Calculation:**
Perform calculations using the Assign activity, combining the weight of each item with the current market price to determine the final price.
5. **Data Storage:**
Write the calculated prices into an Excel file using the Write Range activity in the Excel Application Scope.
6. **Error Handling:**
Implement Try-Catch blocks to manage issues such as failed data retrieval or incorrect API responses.

Benefits

1. **Accuracy and Consistency:**
Automating calculations ensures pricing is always accurate and based on the latest data, avoiding human errors.
2. **Time Efficiency:**
The bot performs tasks faster than manual processes, saving time in data retrieval and computation.
3. **Cost Savings:**
Automation reduces the need for manual labor, leading to significant cost reductions in operations.
4. **Flexibility and Scalability:**
The bot can handle various inventory sizes and be updated to perform additional tasks as needed.
5. **Enhanced Customer Satisfaction:**
Accurate pricing builds trust with customers and improves their shopping experience.

Challenges

1. Integration with External Systems:
Ensuring smooth integration with financial websites or APIs may require robust error-handling and retry mechanisms.
2. Initial Setup and Training:
Developing and deploying the bot involves setup costs and training staff to monitor and maintain it.
3. Data Dependence:
The bot's accuracy relies on the availability of up-to-date information from external sources like APIs or websites.

Key Activities and Technologies

- UiPath Activities: Excel Application Scope, Read Range, Write Range, Open Browser, Get Text, HTTP Request, Assign, Try-Catch.
- Technologies: Web scraping, API integration, RPA automation principles.
- Error Management: Logging, retry mechanisms, and manual review workflows for unresolved errors.

CHAPTER 5

OUTPUT SCREENSHOTS

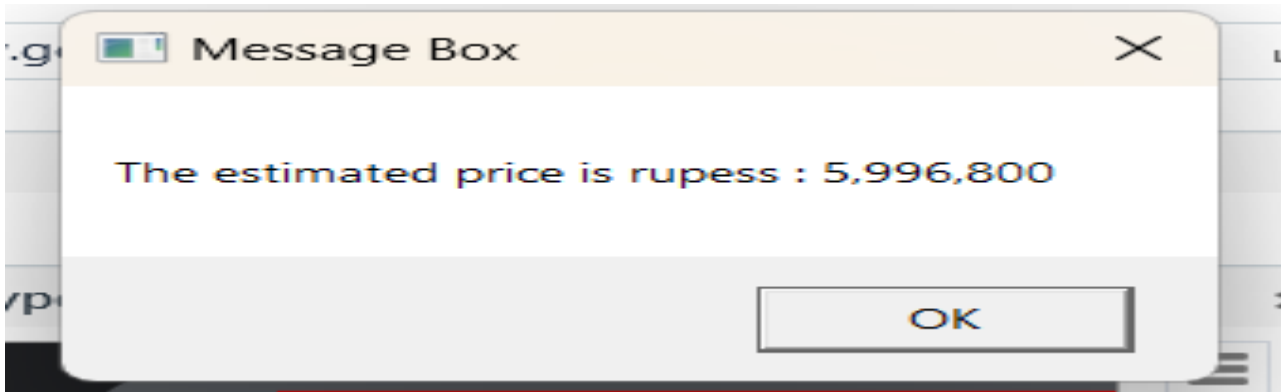
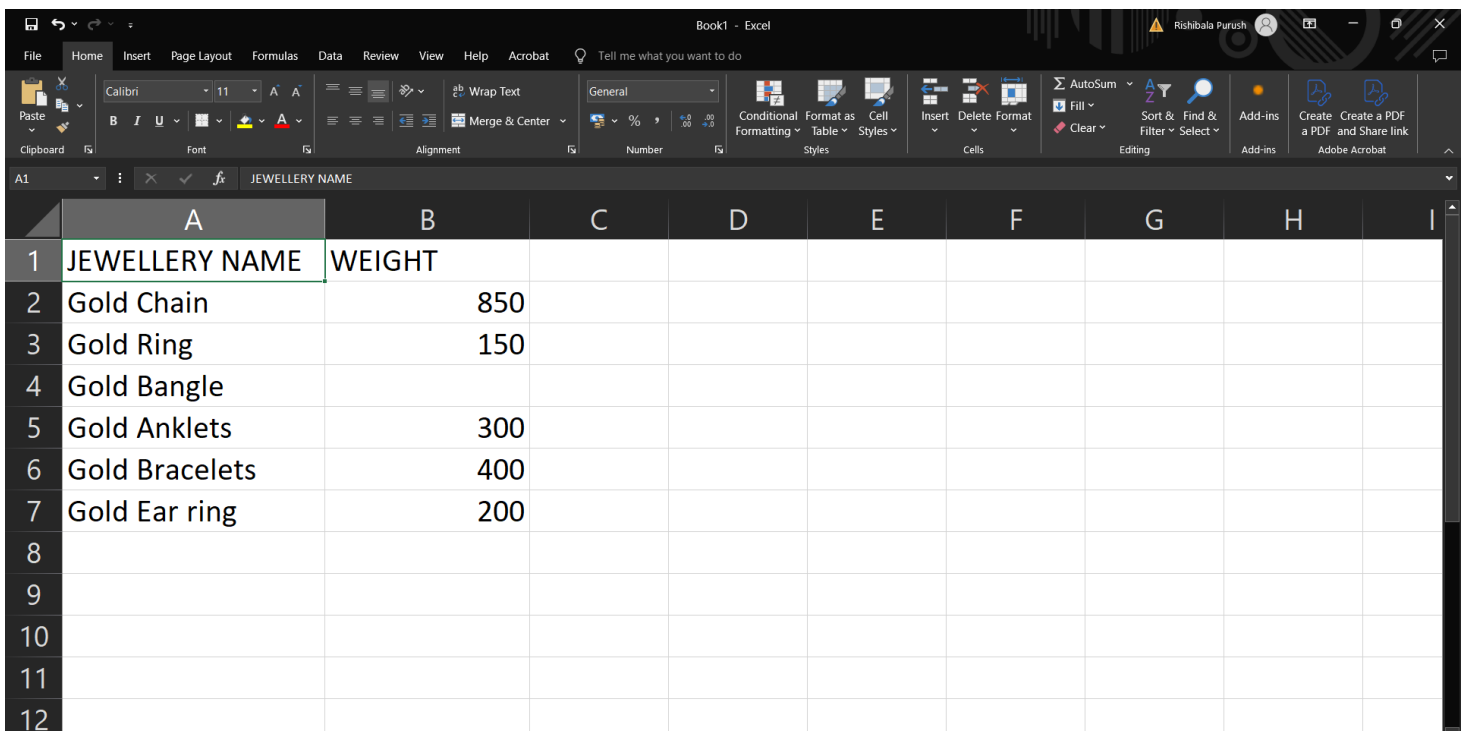


Fig 5.1 output message



	A	B	C	D	E	F	G	H	I
1	JEWELLERY NAME	WEIGHT							
2	Gold Chain	850							
3	Gold Ring	150							
4	Gold Bangle								
5	Gold Anklets	300							
6	Gold Bracelets	400							
7	Gold Ear ring	200							
8									
9									
10									
11									
12									

Fig 5.2 Stock Excel

CHAPTER 6

CONCLUSION

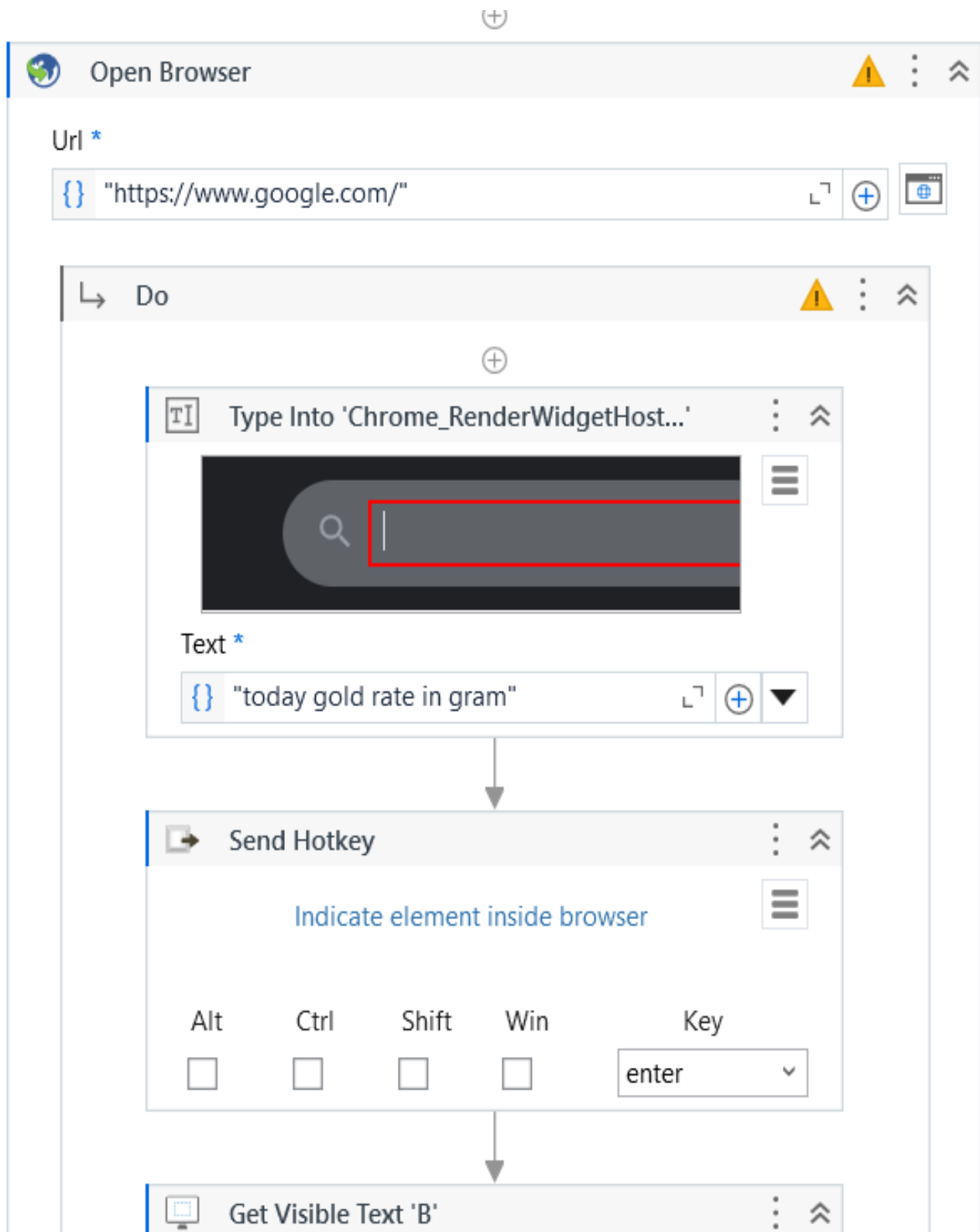
The implementation of Robotic Process Automation (RPA) in Innoventry Software has successfully streamlined key business operations, including billing, report generation, and stock management. By automating repetitive and time-consuming tasks, this system reduces manual intervention, enhances accuracy, and improves overall operational efficiency. The user interacts minimally, providing necessary inputs such as invoice details, while the RPA bot handles the tasks of logging in, selecting processes, fetching data, generating reports, and storing results in Excel files.

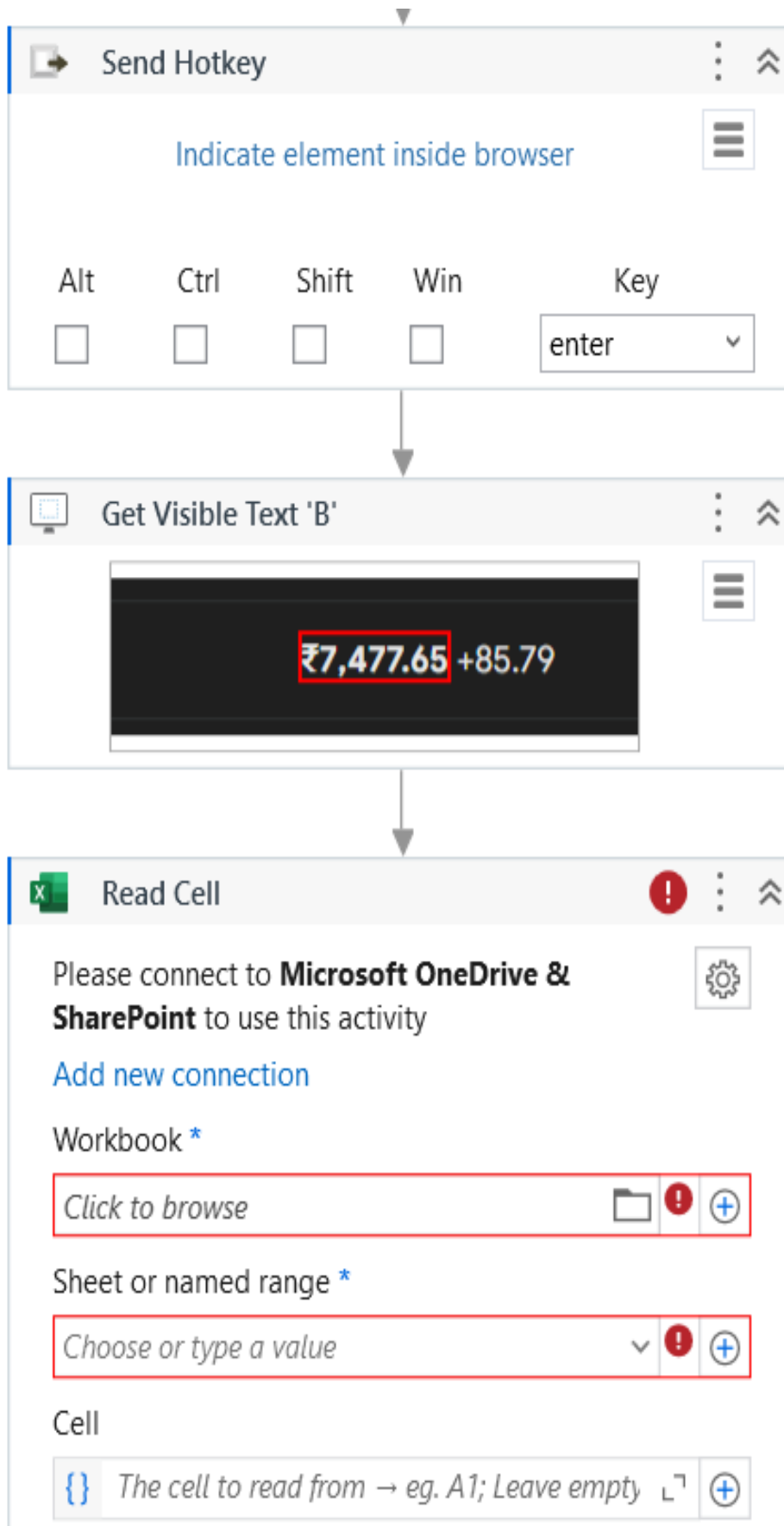
This solution not only saves valuable time but also minimizes human errors, allowing businesses to focus on more strategic tasks. With the ability to scale to other functions within Innoventry Software, the system presents a cost-effective and sustainable way to enhance business operations. The integration of task notifications further ensures transparency and effective communication, making the system both user-friendly and reliable.

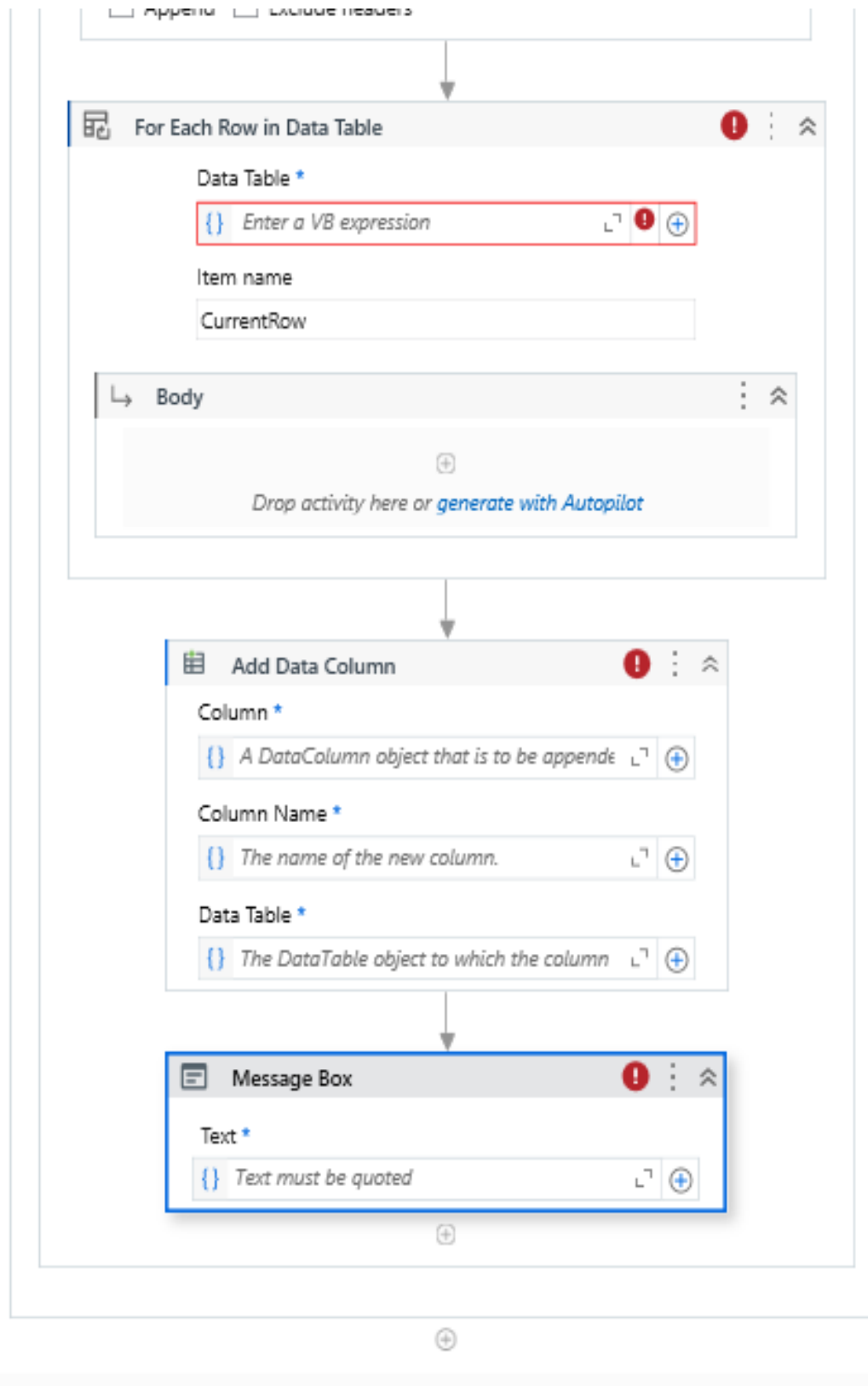
Overall, the RPA automation project for Innoventry Software represents a significant advancement in optimizing business processes, providing a robust solution that improves efficiency, accuracy, and productivity in modern-day business environments.

APPENDIX

WORKFLOW PROCESS







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