A REPORT
ON
Robotic Process Automation
E-Commerce Bot

BY

NAME OF STUDENT	ID.NO
Jatin Nehlani	2020A7PS0100P
Pratham Oza	2020A7PS1679P
Nandish Chokshi	2020B1A72031G

AT
SilverTouch Technologies Ltd, Ahmedabad
A Practice School-I Station of
BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE, PILANI (JULY, 2022)

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PREPARED IN PARTIAL FULFILMENT OF THE
PRACTICE SCHOOL-I COURSE NOS.
BITS C221/BITS C231/BITS C241

A Practice School-I Station of
BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE, PILANI (JULY, 2022)

Acknowledgments

We find ourselves in great pleasure while penning down these lines to express our sincere thanks to those who have helped us immensely throughout our projects until now.

We are much obliged to the **Birla Institute of Technology and Science, Pilani** staff for conducting the Practice School program for the industry exposure and experience, which gives us a chance to work on this project.

Our special thanks to **Dr. Pratik N Seth**, PS instructor at BITS Pilani, for his constant guidance and supervision and for providing beneficial suggestions on the project.

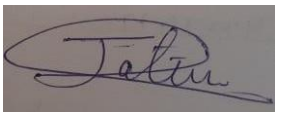
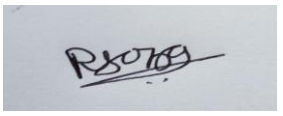
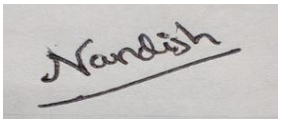
My immense gratitude to **Mrs. Syamala Sharma, Mr. Devendra Singh, Mr. Mandar, and Mrs. Aditi**, Mentors at Silver Touch,for guiding us towards the structure and design of the project as well as providing us with the necessary data and details. I am much obliged to the staff of Silver Touch for conducting various programs for industry exposure and giving a platform for the project.

This report was written as a part of the PS-1 project on E-commerce by Software bots using Automation Anywhere under **Mr. Devendra Singh.**

Certificate

This is to certify that the project report entitled **"E-Commerce Bot"** submitted to Silver Touch Technologies Ltd, Ahmedabad, is prepared in partial fulfillment of the completion of the course titled Practice School-1 (PS-1) offered by BITS Pilani. We declare that neither part of this report has been submitted elsewhere for any other purpose, nor is it similar to any other report in the public or private domains.

➢ **Signature of Student**

Name	Date	Signature
Jatin Nehlani	**20/7/22**	
Pratham Oza	**20/7/22**	
Nandish Chokshi	**20/7/22**	

➢ **Signature of PS Faculty**

Name	Date	Signature
Dr. Pratik Sheth	**20/7/22**	

Executive Summary

We joined Silver Touch Technologies Ltd. on May 30, 2022, under the Practice School - I Program of Birla Institute of Technology and Science, Pilani.

We have learned various domains of RPA and excelled in using Automation Anywhere throughout the journey.

We completed tasks in the following packages under our training: -

1. Excel Basics
2. File & Folder Basics
3. Excel Advanced
4. Email & Credential Vault
5. File & Folder Advanced
6. Recorders
7. Data Table
8. Database
9. Strings
10. PDF & Error Handling
11. Triggers & Forms

We were evaluated based on Diary Entry, Quizzes, seminars, Group discussions & projects. We learned a great deal of knowledge regarding Automation and also pondered over its future of it.

Using all the knowledge, we created our final project, ‘E-Commerce Bot’.

BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE
PILANI (RAJASTHAN)

Practice School
Division

Abstract

Station: SilverTouch Technologies Ltd **Centre:** Ahmedabad

Date of Start: 5th July 2022 **Date of Submission:** 22nd July 2022

Title of the Project: Robotic Process Automation - **E-Commerce Bot**

Name and ID No.:

Jatin Nehlani (2020A7PS0100P)

Pratham Oza(2020A7PS1679P)

Nandish Chokshi(2020B1A72031G)

Disciplines of the student: B.E. Computer Science Engineering

Name of and Designation of the Project Expert: Devendra Singh, RPA Developer

Name of the PS Faculty: Pratik N. Seth

Keywords: Retail, E-commerce, RPA, Automation Anywhere, Bots

Project Areas: Development of E-commerce Bot using Automation Anywhere

This is a report for the project done at SilverTouch, for Practice School-I of BITS Pilani. Automation Anywhere is a non-coding tool to create software bots that can do the work faster and more efficiently than humans.
Bot processing is a very emerging and new-age industry. It is a hack to improve exponentially all the everyday tasks that require labor. Time, Money & Labor is reduced significantly. Errors are minimized or nullified, and folds improve efficiency and correctness.

Objective

The process has been selected for RPA as part of the larger project initiative conducted within the E-commerce department. The objective of this process automation is linked to the project business case and mainly
intended to:

- Deliver faster processing
- Reduce redundant activities
- Improve overall performance and reliability

The project will display an E-commerce bot that will perform a combination of various Automation Anywhere Packages. The bot looks for the client's requested books and gives him information about them: -

- ➔ It will take input from the client’s emails and store it in a source excel file.
- ➔ Search the client's book list on the Amazon Retail Website.
- ➔ Gather information about the book's name, author, and price into an excel file.
- ➔ The final excel file will be mailed to the assigned clients.

Problem Statement

Assumption - To fill in Data of ‘n’ RPA Books (Author Name, Price, Book) by an employee when extracting data from Amazon Retail consumes enormous time, capital, and labor resources.

We encounter the problem of the wastage of essential resources that can be used for a better task at any organization. Usage of such resources in a repetitive & monotonous task leads to wastage.

RPA eliminates all such problems with maximum efficiency and minimum wastage of resources.

Scope Of Work

RPA's potential future scope is comparatively very broad. Many human tasks can be easily automated with the use of RPA tools and technologies. The realm of data input and data decryption jobs is where RPA's future application potential can be seen. RPA makes it simple to automate these operations. RPA makes it simple to complete several repetitive operations including formatting, data assembly, and other tasks that call for a series of processes. RPA is also used to carry out the other computer-supported processes that make use of a set of procedures. If bots took over all of the jobs currently carried out by people, the data collecting would be improved, and the data could be examined more effectively. RPA is expected to have considerable growth in the future year, which will result in higher technological capabilities that will help to significantly lower the risk of inaccurate regulatory reporting, including improved data analytics and higher data accuracy. RPA is advancing quickly in the market, and the adoption of this robotic automated technology could aid in restructuring the business process management industry.

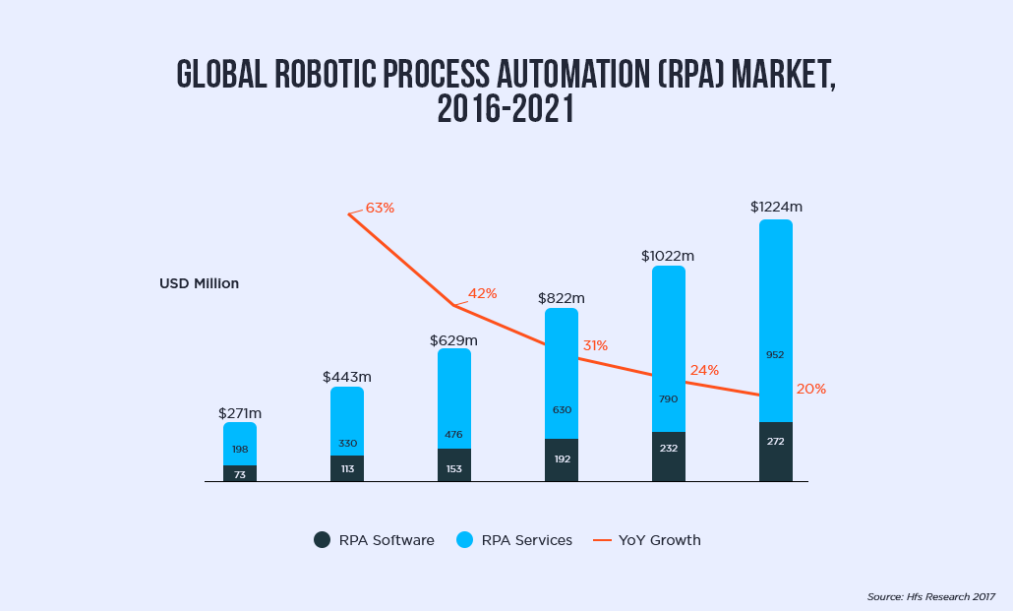


Fig 0.1 Global RPA Market 2016-21

The RPA is believed to be the future of IT automation. An individual's professional views will naturally expand if they choose to pursue a career in RPA. One of the promising areas is artificial intelligence, which would have an impact on both employment and the level of decision-making innovation. Additionally, the RPA would demonstrate its promising future in the financial industry, where robots would essentially handle all calculations and transactions. More cutting-edge technologies in the region, such as the production of autos and aircraft, will also demonstrate its effects. RPA is thought to be a very effective professional path. Emerging graduates can easily anticipate a significant portion of work chances globally. Additionally, compared to other fields, compensation packages for professionals with these skill sets are comparatively greater. By using the RPA training, one can tilt their career graph in the direction of high-ranking achievement.

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Introduction

A manual workforce is hard to maintain in today's digital world. We adapt to automation and machine work as we move on to further years and a strong upcoming digital transformation. It has numerous advantages over traditional labor; Time, money, efficiency, error handling, durability, and work years.

One of the most tedious and essential processes is Data Entry. In any organization, correct data management is a must to uphold progress. Excel is the primary way to store information on assets, even on multiple hierarchical levels. In such scenarios, one may find himself/herself stuck with management and entry of hundreds of similar contents with slight changes in personal information. This drains the person physically and mentally, which is a significant problem for the company.

The project will demonstrate an effective way of data entry of different book names gathered from clients' emails and searching the same on an e-commerce website. The following details will be picked via recorder, and the data will be inputted into an excel file, which will be mailed back to the clients.

Email Body: -

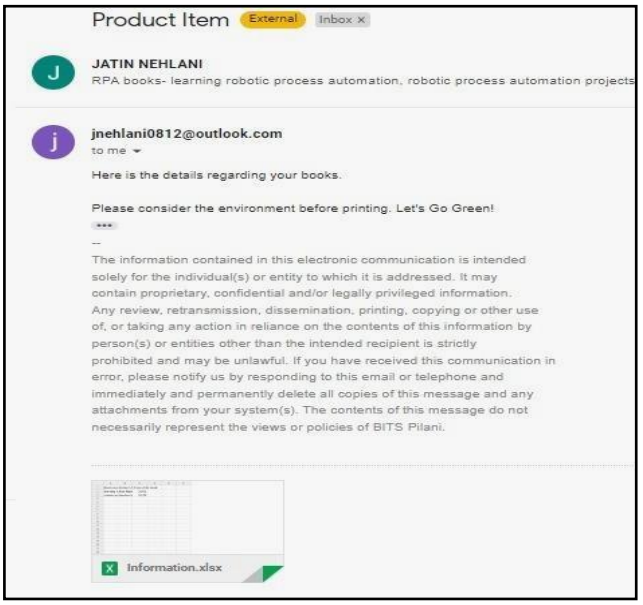

Fig 1.1

Limitations include familiarity with AA software and difficulties with recorder functionality.

Robotic Process Automation

Robotic process automation (RPA) is a type of automated business process technology based on analog software robots, artificial intelligence (AI), or digital staff. They are sometimes called software robots (not to be confused with robotic software).

For automated workflow automation tools, a software developer generates a task list to automatically perform a task with the interface in the back-end system using an internal application interface (APIs) or a dedicated writing language. In contrast, RPA systems develop a list of actions by viewing the user performing that function in the application interface (GUI), then performing the default by repeating those tasks directly in the GUI. This may reduce the use of automated applications for products that may not include APIs for this purpose.

RPA tools have strong technical similarities and tools for testing user interfaces. These tools also automatically integrate with the GUI and often do so by repeating a set of user actions performed by the user. RPA tools differ from such systems because they allow data to be processed between and within multiple applications, for example, to receive an invoice email (similar to our bot, too), extract data, and type it into a bookstore.

The Future of RPA is smarter Automations. The next step, which some organizations are already taking, is to blend attended automation and RPA with artificial intelligence (AI) and machine learning tools. Variously known as intelligent automation, intelligent process automation, and cognitive RPA, this class of solutions enables enterprises to automate more complex, less rule-based tasks. Softwares such as Automation Anywhere, Blue Prism, Ui Path, etc... support RPA and are used worldwide for bot processing.

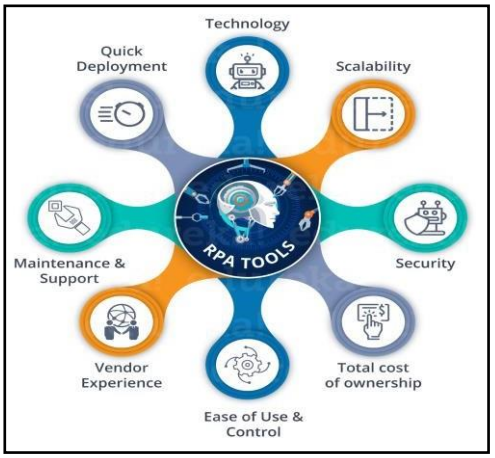

Fig 2.1.1

Automation Anywhere

Automation Anywhere is a Robotic Process Automation tool that allows organizations to automate business processes from start to finish. The prime factor of Automation Anywhere, which makes it different from others and easy to use, is that it requires little to no knowledge of programming languages to create bots. The user interface (UI) of Automation Anywhere is straightforward and easy to understand, even for non-programming people. Automation Anywhere allows us to create three types of bots which are:

1. Task Bot
2. Meta Bot
3. IQ Bot

All the bots made in Automation Anywhere are accessible from the Control Room.

Automation Anywhere also provides extra features like:

1. Optical Character Recognition (OCR)
2. Bot Insight
3. Trigger Manager
4. BOT Store
5. Automation People Community
6. Automation University
7. Automation Documentation

Automation Anywhere is a high-performance tool that allows organizations to implement RPA technology into their existing processes.

Task Bot

Use the *Run, Pause, and Stop* actions in the Task Bot package to manage running one or more child bots from a parent bot or with third-party software using an API.

1. Run - Runs the selected task multiple times for a specified number of times or several hours. The task can be repeated until the user chooses to stop it.
2. Pause - Temporarily pauses the running bot. A Resume button appears when the bot reaches the Pause action during run time. We can click Resume for the bot to continue to the next action.
3. Stop - Stops the running bot. For example, use the Stop action to terminate the bot if a condition is met, such as if the bot encounters a file larger than 100 MB.

Meta Bot

MetaBots are highly reusable, created once, and used everywhere bots. MetaBots can be shared across an enterprise or uploaded to the Bot Store to make them available to the entire Automation Anywhere community.

Users with the correct roles, permissions, and licensing can create, save, and share MetaBots. As both creators and consumers, bot developers create MetaBots for reuse by other bot developers within an enterprise or share MetaBots across the entire Automation Anywhere community by uploading MetaBots to the Bot Store.

Bot developers capture and save assets, then develop navigational logic to produce reusable MetaBots.

Assets - Application screens and DLLs make up the Assets bot developers use to define and pre-configure for the use case of a target application.

Logic - Logic is the navigational workflow wrapped around components, commands, functions, and DLLs within a Task Bot or Meta Bot. Logic is created, edited, and saved from the Workbench.

IQ Bot

IQ Bot provides cognitive (intelligent) automation to uncover and transform essential but less structured data to automate business processes quickly and efficiently, simultaneously reducing human error.

Cognitive automation processes semi-structured and unstructured data and converts it into structured data used by Robotic Process Automation (RPA) bots for end-to-end auto

AS - IS Process

RPA is a gift to automate all redundant tasks humans do for hours. An employee in any organization will have to take up a lot of time and effort to complete a similar e-commerce task compared to our bot.

Assuming a particular scenario of work done by a group of employees to complete an e-commerce task. Taking ‘n’ as the number of books.

- Time - ‘5n’ minutes
- Labor - More than two people are required for the whole day
- Capital - Whole day paid a salary of rrrrr
- Human Errors - 1 in 4 data input of Books

We can see inefficiency in the process before the bot was installed in that particular organization.

Stress to employees

Fig 3.1.1

Wastage of Time

Fig 3.1.2

Multiple Errors by employees

Fig 3.1.3

Bot Modules

Excel Advanced

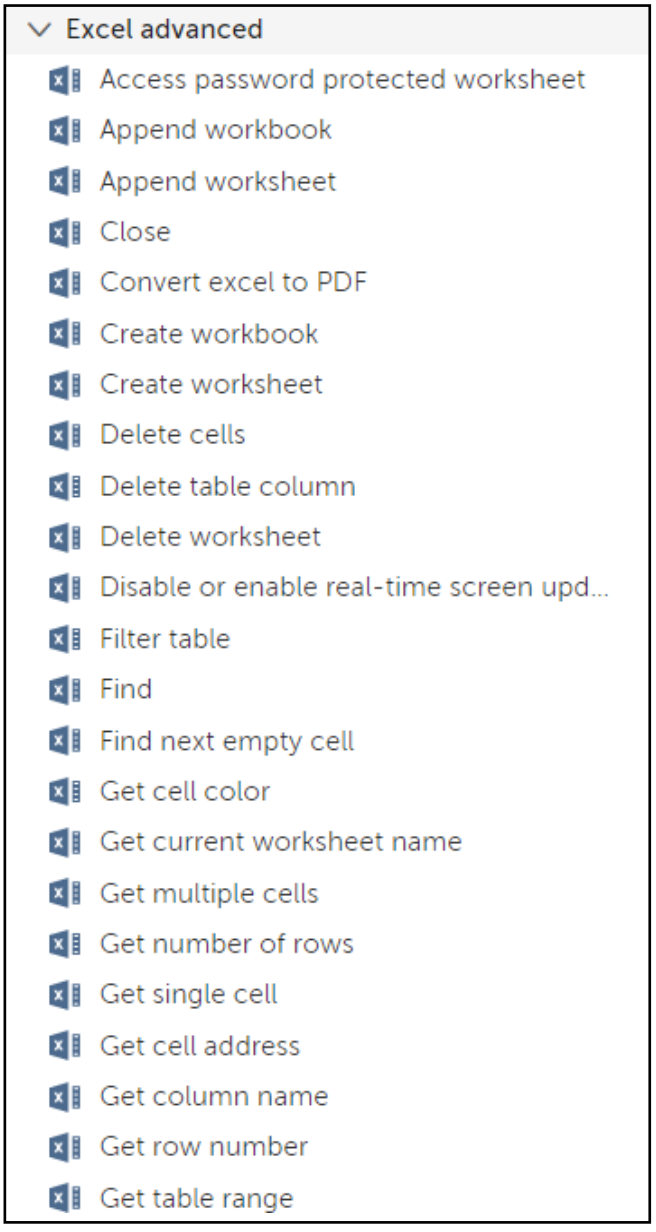

Fig 3.2.1

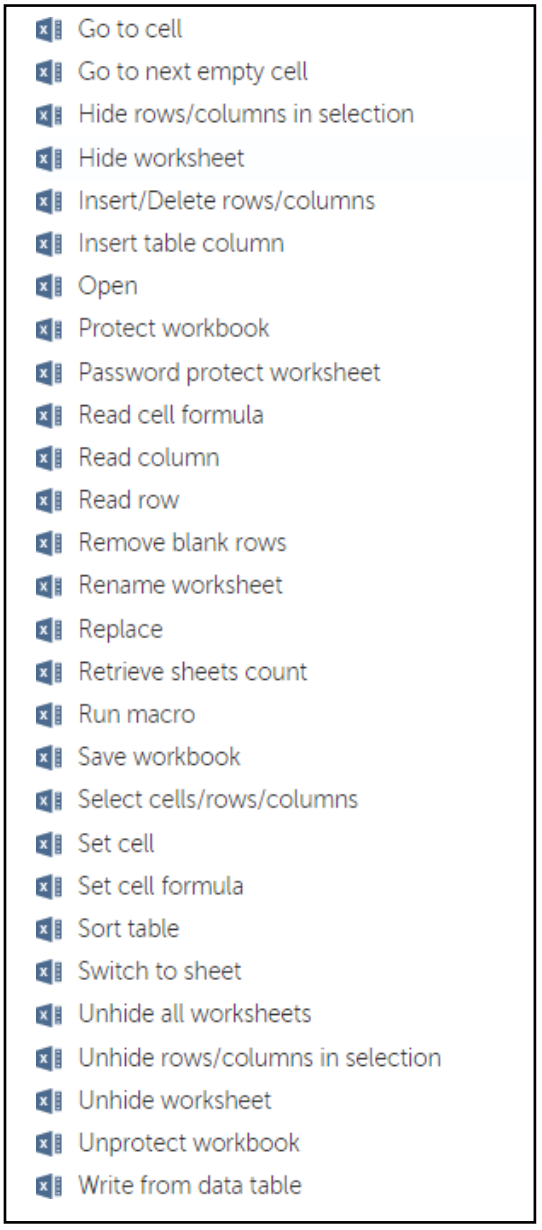

Fig 3.2.2

The Excel command enables you to automate many repetitive tasks involving spreadsheets. Some common scenarios include:

- Copy data from one Excel spreadsheet to another.
- Extract data from an application to an Excel spreadsheet.
- Extract data from a website to an Excel spreadsheet.
- Move data from an Excel spreadsheet to another application.
- Transfer data from Microsoft Access to Excel.
- Transfer Excel data to a website form.
- Delete rows or columns in Excel.
- Compare two columns or two cells in an Excel spreadsheet.
- Sort data in Excel spreadsheets and delete duplicate rows.

Loop

Fig 3.2.3

- Use the Loop package to run a sequence of actions repeatedly for a specific number of times or until a particular condition is met.
- The Loop package enables you to run specific actions within a bot repeatedly. For example, repeat the set of activities that read data from each row of a Microsoft Excel file, rename all files in a folder, and save each email in a mailbox. We can also use the If action within the Loop action to validate a condition and, based on the outcome of it, skip the current iteration in the loop or even break the loop.
- For conditional loops, different actions are taken depending on whether the dependent parameters are met. For curls with a specified number of iterations, the loop exits on the last iteration and goes to the next step in the bot.

Recorder

Fig 3.2.4

Fig 3.2.5

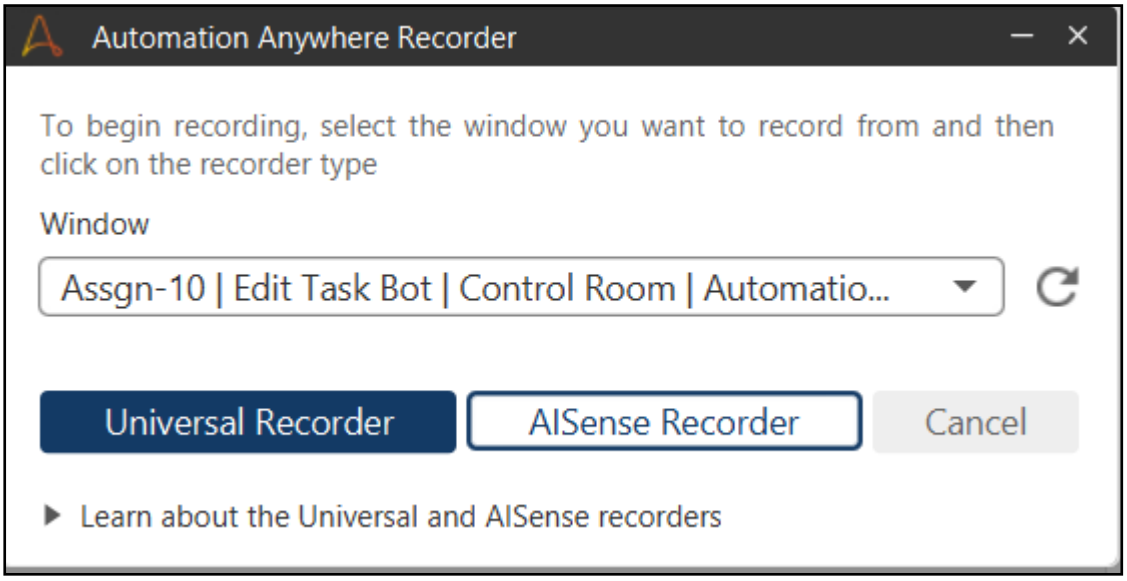

Fig 3.2.6

- We can use two recorders in Automation 360, the Universal Recorder and the AI Sense Recorder, to automate tasks by recording interactions with objects such as click, read (data extraction), and write (data entry).
- The Start recording icon serves as a standard entry point for both recorders
- When we select an object to capture, the Universal Recorder collects data on the object's properties to identify the object during run time. We can do the following with the object properties:

- Verify that the captured object properties match your intended object.
  For example, when capturing a table from a website, ensure the Control Type and HTML Tag values are tables.
- For Retrieving a property value. We used the Get property action and entered the property's name in the Property name field or selected an object property from the list of available properties. The list includes suggested property values from the search criteria in the Object Properties table. To select an object property from the list of properties, move the mouse pointer to the right of the Property name field and click the arrow.
  For example, to retrieve the text of a link, use the Get property action and enter HTML Inner Text in the Property name field or select HTML Inner Text from the list of properties.
- We can select a combination of properties for the bot to search the object in our business application window uniquely.
- The search algorithm for the Recorder package ensures that when we run a bot, an object is captured only if its properties match the exact search criterion you selected in the Object properties table. If the object's properties do not check the search criterion exactly, then the bot fails with an error message.

Error Handling

- The Error handler package contains actions that enable you to easily handle exceptions a bot encounters and transfer control to the other activities within that bot.
- The actions in the package enable you to separate the activities you want to use to perform a task from the actions you want to use to handle an exception. Handling exceptions ensures that a bot completes a job when it encounters an error 30 and defines actions when an error occurs.

Fig 3.2.7

Email

Use the Email Automation command to automate tasks for the mail server and incoming messages. Email Automation command enables you to automate mail server operations and handle incoming email messages. You can automate the following tasks:

- Manage incoming email messages and download attachments to specific folders.
- Clear unwanted email messages.
- Communicate with the mail server and monitor email activity.
- Extract email data (Subject, Message, From To CC: and attachments) to applications (Excel, Word, Notepad, and others) or to folders on your computer.
- Select one of these options: IMAP, POP3, EWS, or EWS with OAuth servers.
- Organize email messages based on status (All, Read, and Unread).
- Select either HTML or Plain text formats for email messages.

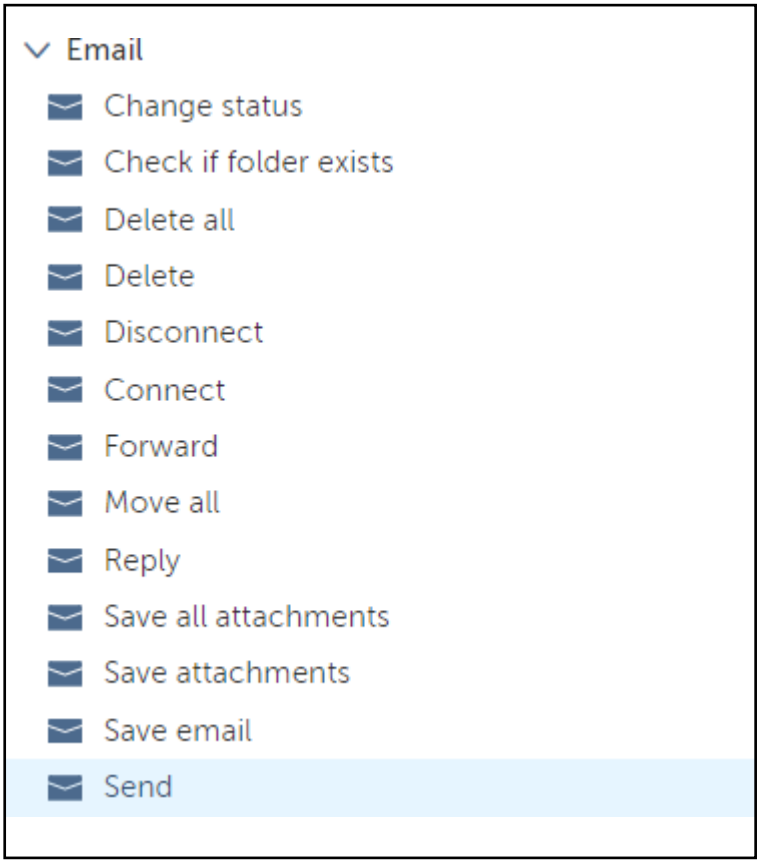

Fig 3.2.8

To-Be Process

1. **Connecting to the Email Server and looping through all the Emails.**

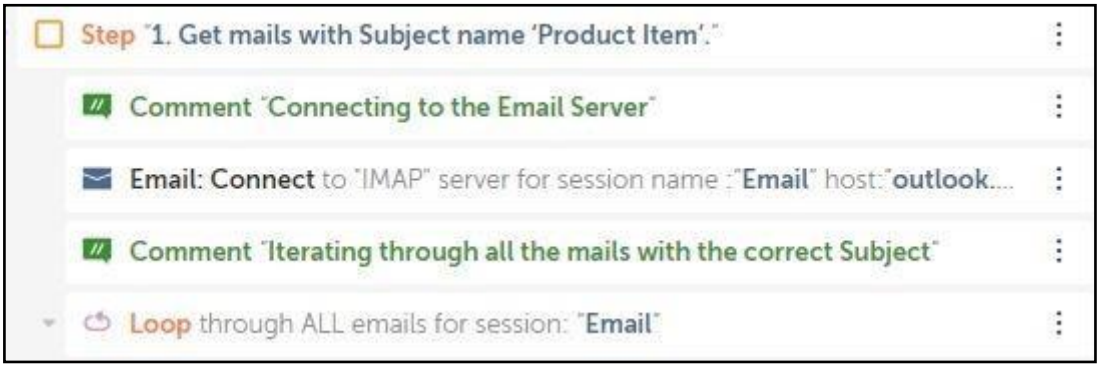

Fig 3.3.1

2. **Reading the body of the Emails with the subject "Product Item" and extracting the item name"RPA books".**

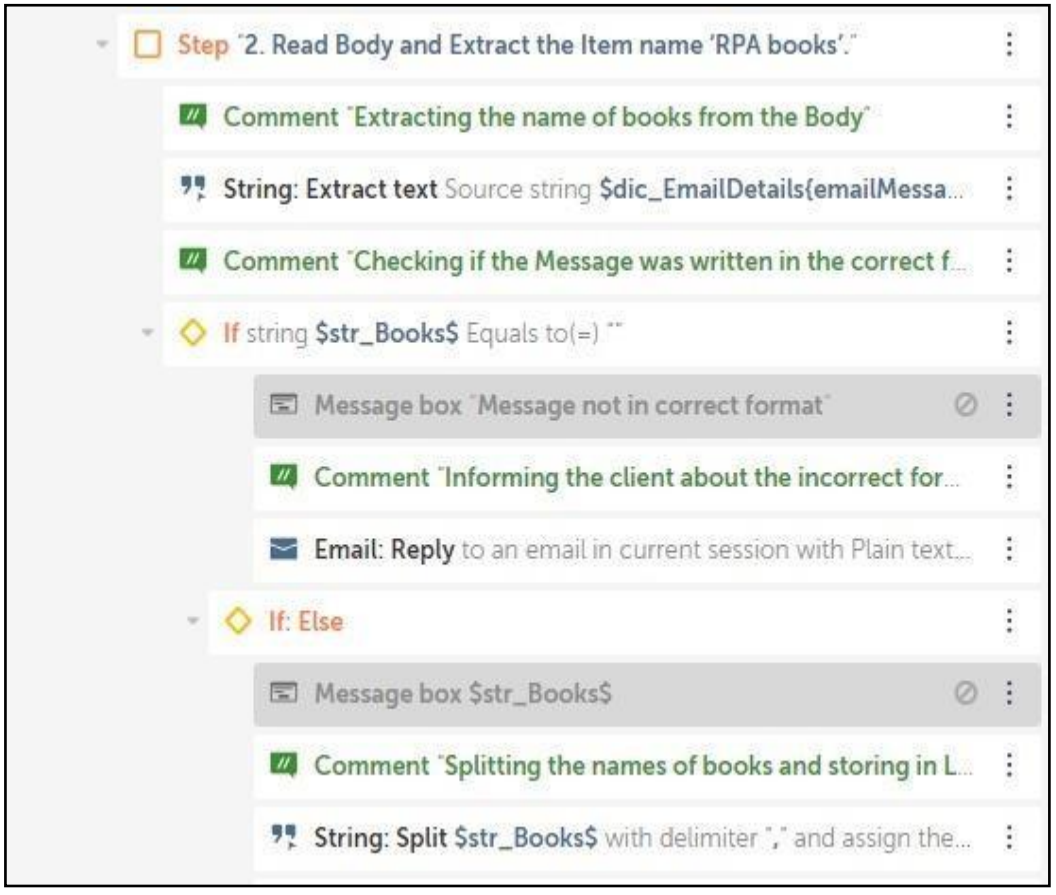

Fig 3.3.2

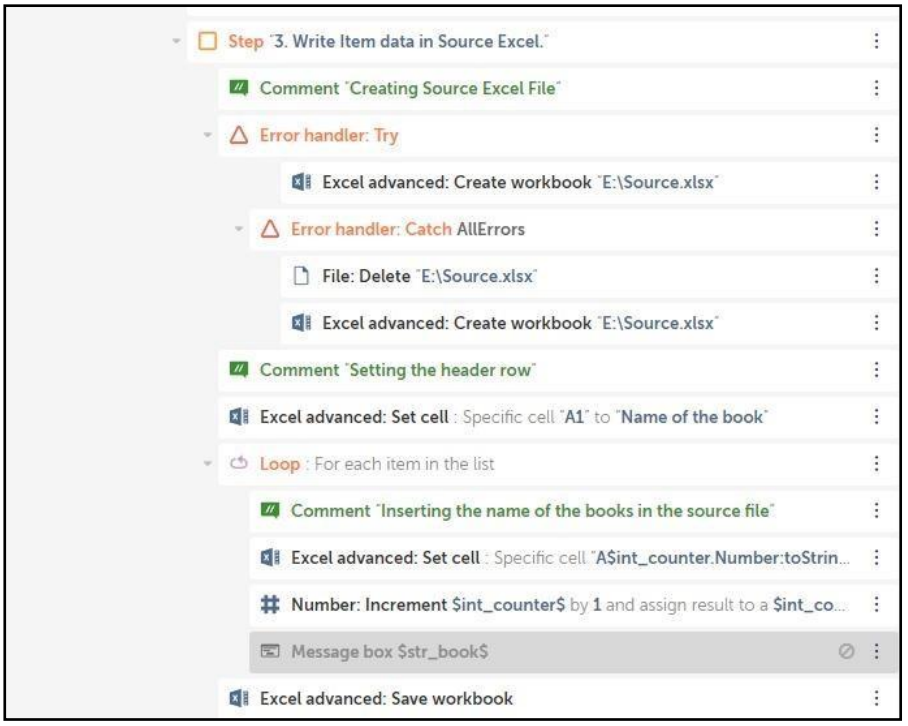

Fig 3.3.3

3. Writing the lists of books in the source Excel file and creating the information Excel file.

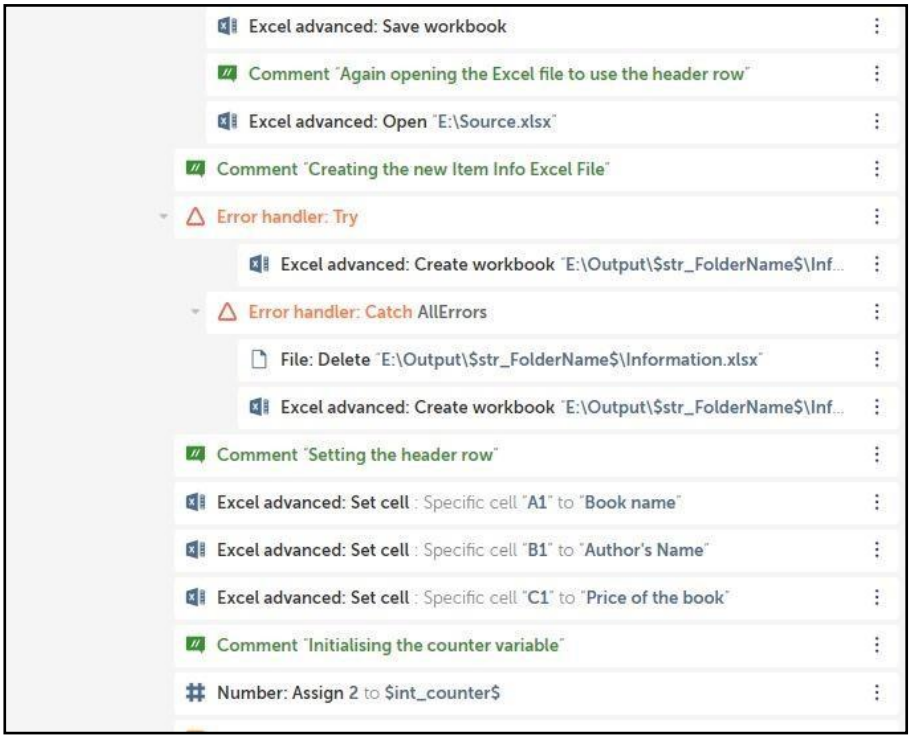

Fig 3.3.4

4. Opening the Amazon site link and search for each item in the Source Excel file.

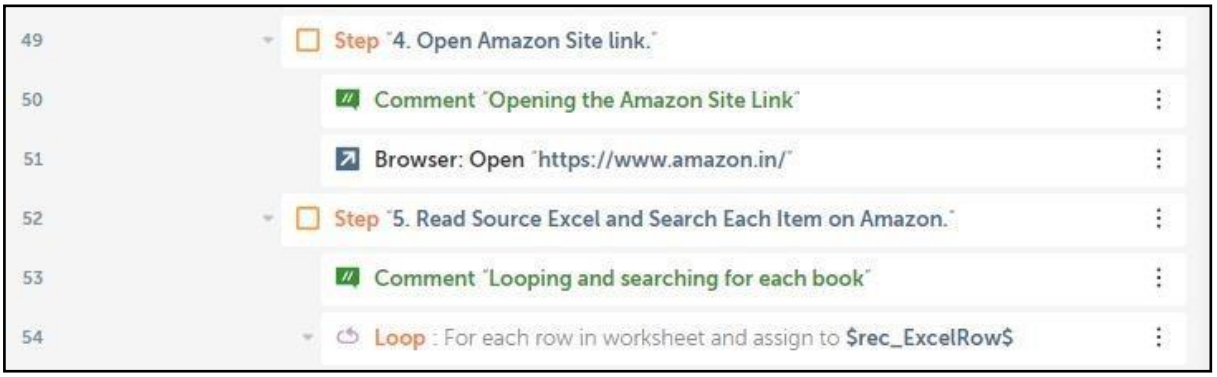

Fig 3.3.5

5. Scrapping the book's name, author, and price into the new Information excel file.

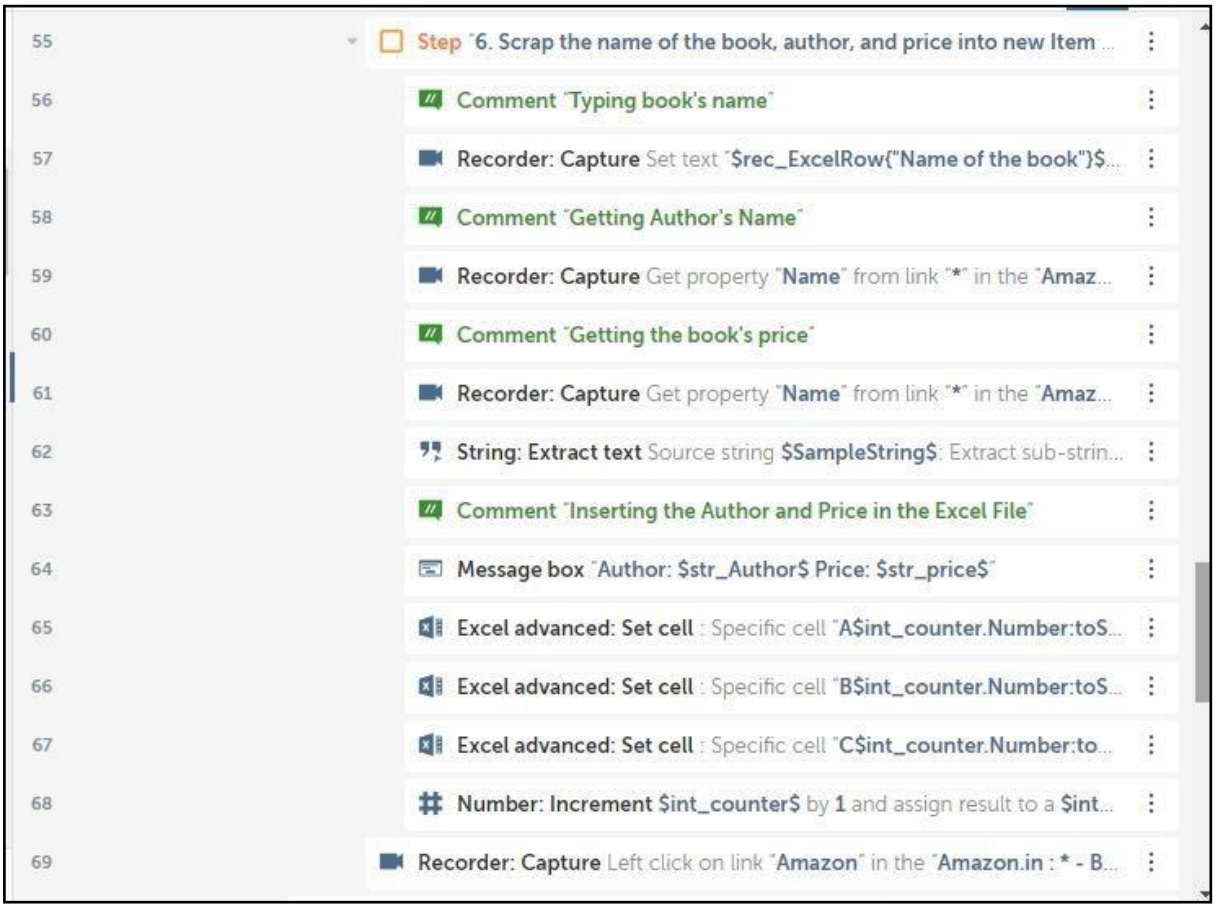

Fig 3.3.6

6. **Closing all the files and sending the mail to the client with the attached file.**

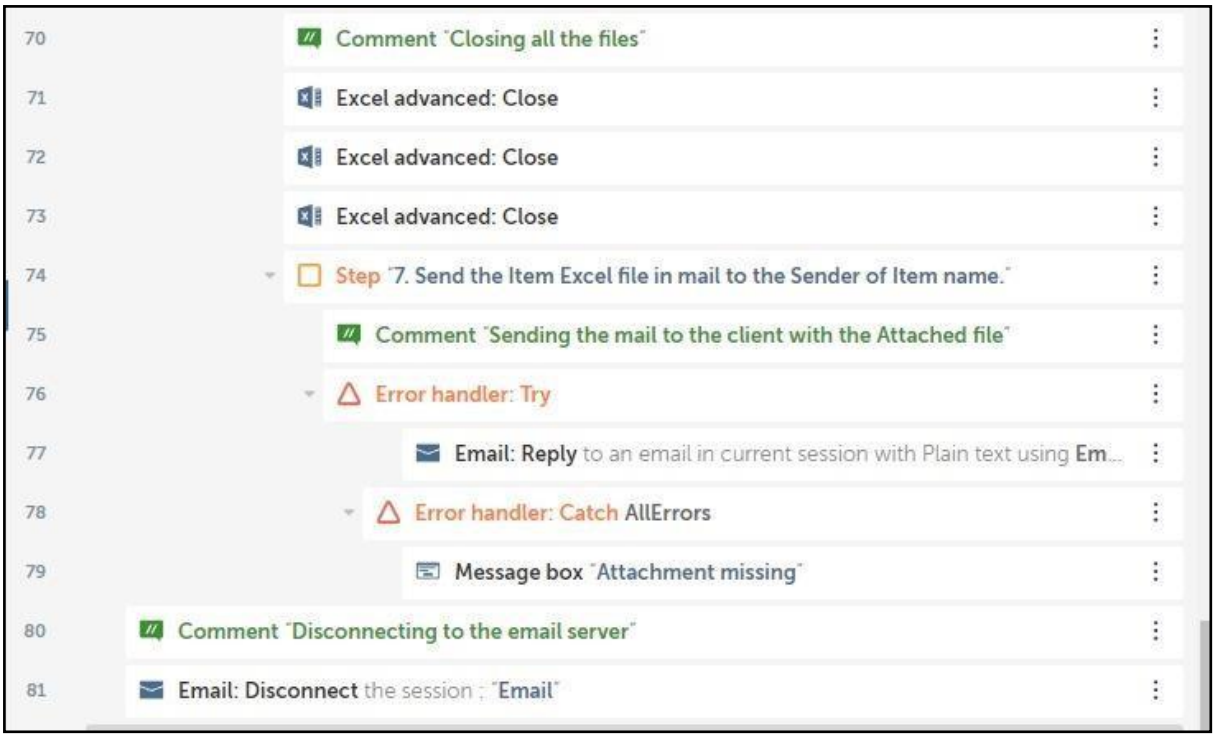

Fig 3.3.7

Analysis

This bot has made life so much easier; now, a person doesn't have to sit for hours writing emails to every student and to attach the grade sheet manually; it's a very time-consuming taskfor a human. For example, approximately 1000 book names are received from the mails by clients, so if a single person has to insert the data of books and type emails and attach the excelsheet (Let's assume it takes 2 min per mail), then it will take a very long time to execute the whole work (Approximately 33.4 hours). The chances of error are pretty high.

Although now, the person just has to run the bot, this bot will automatically send the mail to the respective clients and attach the excel sheet. The efficiency of the bot is way more than a human. An E-commerce bot may take approximately 1.5 hours.

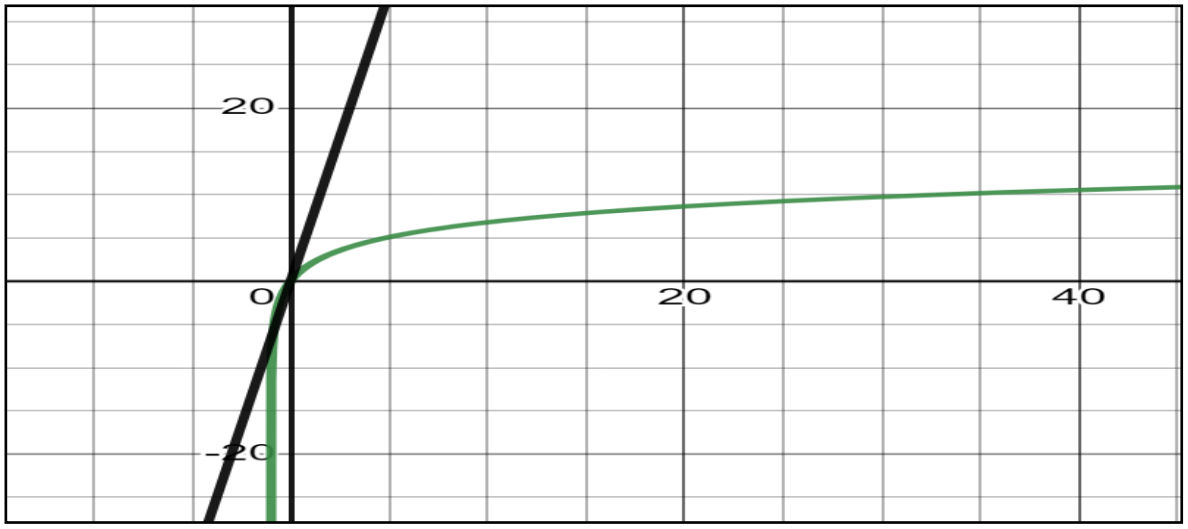

Fig 3.4.1

The excel sheets can be password protected or with encrypted file names for enhanced privacy and security reasons.

The green line represents manual labor work & Black line represents E-commerce Bot.

Y-axis depicts no. of emails (in hundreds)

The X-axis depicts no. of hours

Assumption, Green line —> Y = klog(x+1), where k = 10/33.3

Assumption, Black line—> Y = px, where p =10/1.5

Conclusion

RPA is an upcoming field, and all the software which supports it is very newly developed. This shows a high chance of automation being a significant part of the future and RPA being one of its pillars—software robots in marketing help in marketing operations, customer engagement, and AI-powered Customer experience.

E-commerce Bot can help in eliminating or drastically reducing manual input of purchase orders and other administrative tasks and thus removing human error from the processes,

With AI capabilities implemented, RPA can respond to proposals, quotes, and questions requests. RPA can capture, use and exchange data with various systems, including legacy systems, without programming integration. With data analytics, RPA can be used to identify and optimize any inefficiencies.

RPA can be used in multiple ways to streamline processes across the supply chain. In most cases, only limitations result from difficulties in proper identification and mapping processes that could be automated.

Here are multiple areas in which e-commerce companies can benefit from robotic process automation, including:

- Customer service,
- Content creation,
- Product categorization
- Automated marketing,
- Inventory updates,
- Supply chain management, including vendor and supplier onboarding,
- Return processing,
- Advanced sales analytics,
- Multiple back-office processes, including accounting and human resources.

We found a detailed analysis of efficiency and time management for E-commerce using a bot from our project. We used an E-Commerce bot to demonstrate scraping details of a book mailed by the client in a faster and more efficient way.

We discussed various important parts of the domain, including Robotic Process Automation, Automation Anywhere, various bot modules, and the bot's working. We learned different new pieces of information along the same path and used them in our bot.

We pasted our code and explained the working of our bot. We have also highlighted the importance of commenting for cleaner code and better understanding for the reader.

Finally, we learned the importance of RPA using a practical example and by relating it to our project.

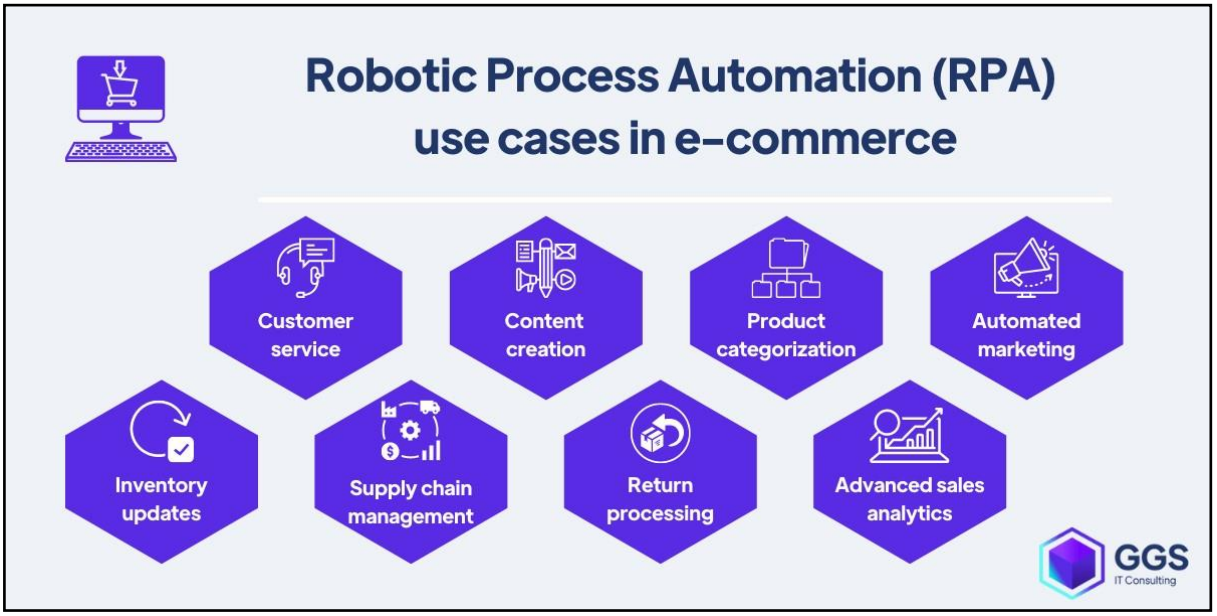

Fig 4.1

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Glossary

- ★ RPA - Robotic Process Automation
- ★ AA - Automation Anywhere
- ★ STTL - Silver Touch Technologies Ltd.
- ★ E-Commerce- Electronic Commerce
- ★ HTML- HyperText Markup Language
- ★ API - Application programming interface
- ★ OCR-Optical Character Recognition
- ★ GUI - Graphical User Interface
- ★ Bot - A software application that is programmed to do specific tasks automatically
- ★ Omni Channel - Multichannel approach to sales that seeks to provide customers with a seamless shopping experience.
- ★ Packages - Detailed instructions for users to independently develop custom actions