Product Recommendation System using Machine Learning and Robotic Process Automation

[1]Darshan B.P, [2]Shalmali M, [3]M.S. Ziyad, and [4],*Shivaprasad T.K

[1],[2],[3],[4]Department of Computer Science and Engineering, Mangalore Institute of Technology and Engineering, Badaga Mijar, Moodabidre, Mangalore, Karnataka, India
*Corresponding author. Email: shivaprasad@mite.ac.in

Abstract— Recent research has increasingly indicated that social media branding can bring about desired benefits for firms. Firms are turning to social media to promote their products and to engage their customers. Companies try to achieve this by grabbing the customer's attention towards their products through advertisements. But the publicity of their products does not reach the right audience. This paper describes a technique which automates the business processes in advertising the products in the social media through robotic processing automation tool where the inputs are taken from the company. The robot then processes this data in such a way that the product is advertised automatically displayed on customer's social media feed, so that the company grabs their customer attention effectively. This software makes smart advertisers can target more users for the given budget, which makes the company maximize the number of reached unique preferred users. Further product recommendation can be done for different products with different websites so that based on product name websites can be looped. Improvements to this recommendation method can also be done by considering other elements like named-entities, people and their occupation.

Index Terms— Robotic Process Automation, Recommendation system

I. INTRODUCTION

Companies try to achieve the customer's attention towards their products through advertisements. But the publicity of their products does not reach the right audience who require it and expenditure on human power advertising isn't worth the cost. So, the main focus is to reduce the company's time spending on promoting or advertising their products on social media and make the products to be advertised to the right audience [1]. In this way, companies need not explain to social media about how to, where to advertise to reach the right audience.

Robotic Process Automation (RPA) is an application of technology aimed at automating business processes. Using RPA tools, one can configure software to capture and interpret transaction processing applications, manipulate data, activate responses and interact with other digital systems [2]. Robotic process automation allows business professionals to easily configure software robots to automate repetitive, routine work between multiple systems, filling gaps in automation to improve business processes. These bots work directly across application user interfaces, mimicking the actions a person [3].

II. PROPOSED METHODOLOGY

The main aim of the project is to automate business processes in advertising the products in the social media through robotic processing automation tool where the inputs are taken from the company about their products in full detail through online and acquired data is given to the robot that uses RPA

The robot then processes this data in such a way that the product is advertised automatically on customer's social media [4].

The objective of this project is as follows:
- User searches the web for a particular product.
- The information will be collected using the RPA tool and is stored in Excel, later it is filtered using python programming accordingly.
- Detailed product details will be displayed as advertisements using the RPA tool as the user uses his social media.

The system implementation takes place in various stages.

A. Google activity extraction

User input from the search engine is extracted by going through the user activity website and stored in the excel sheet. Here the user should login to their respective email. Through which the search history of the user will be collected and all the details will be stored in an excel file. Workflow of Google activity extraction is shown in the Fig 1 and Fig 2.

B. Filtering

As the excel file contains all the search history of the user, by making use of machine learning the collected data is filtered to get the proper key words required for recommendation purpose.

C. Web scraping

Based on the key words this module does web scraping. With

the help of the product name it searches the product in a particular company website and the extracted data is stored in the excel sheet. The images of the product will also be taken from the website and is stored to display it on the user's social media account. Workflow of web scraping and image scrapping is shown in Fig 3 and Fig 4 respectively.

D.   Displaying ads

Once the web scraping is done, the php code will run to access the extracted data and displays it as ads in a required template on the user's page in social media.
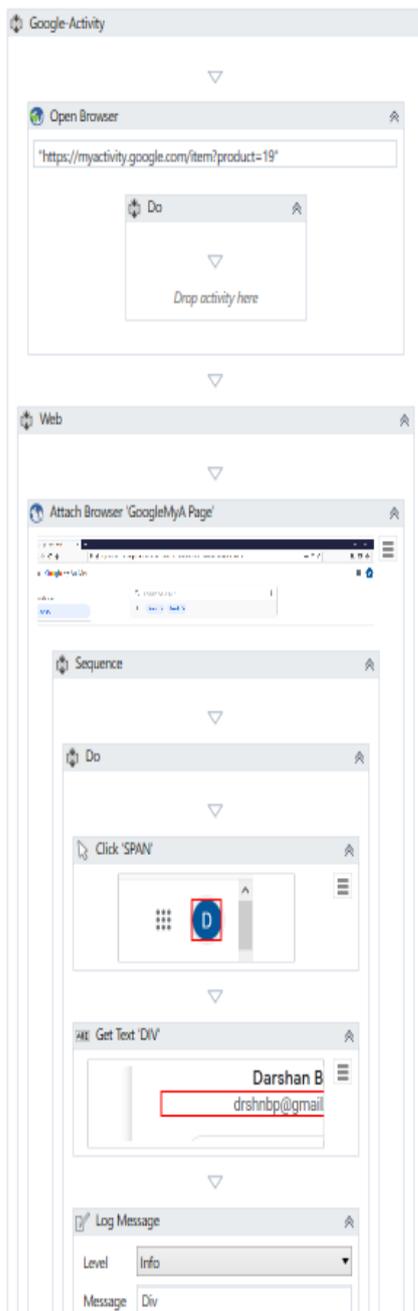
Fig 1 Workflow of Google activity extraction
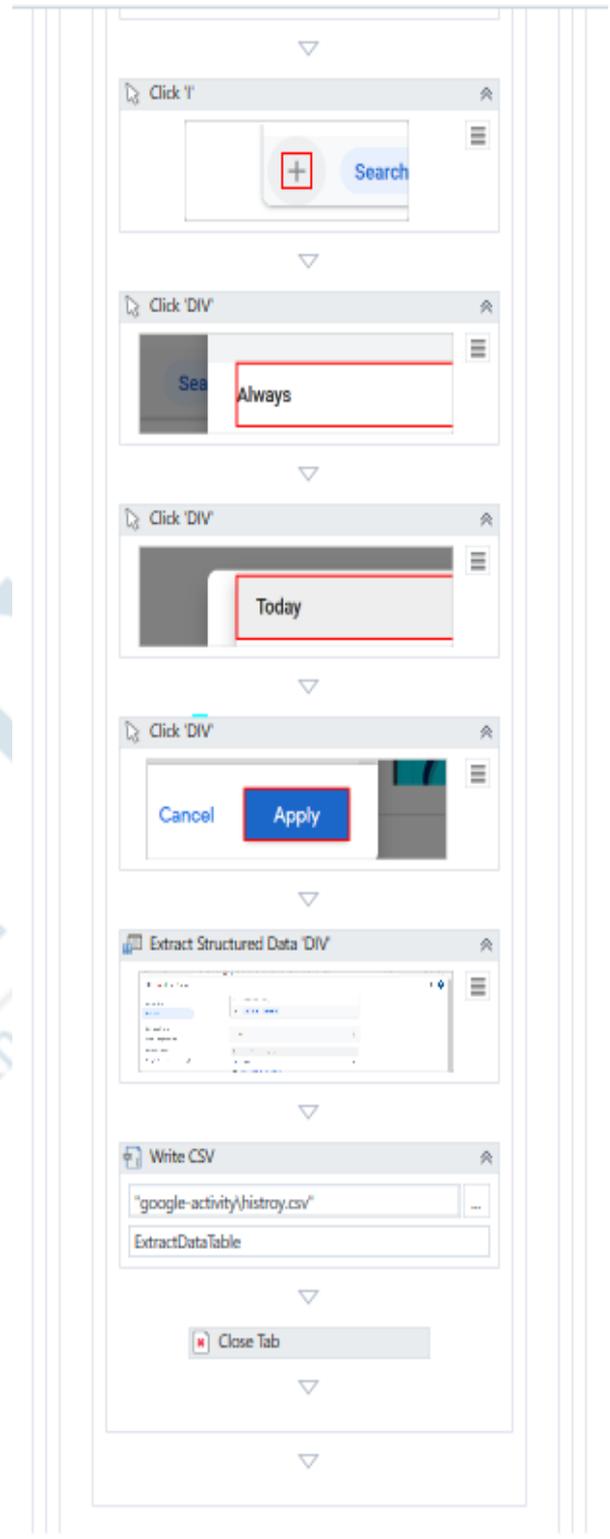
Fig 2 Workflow of Google activity extraction
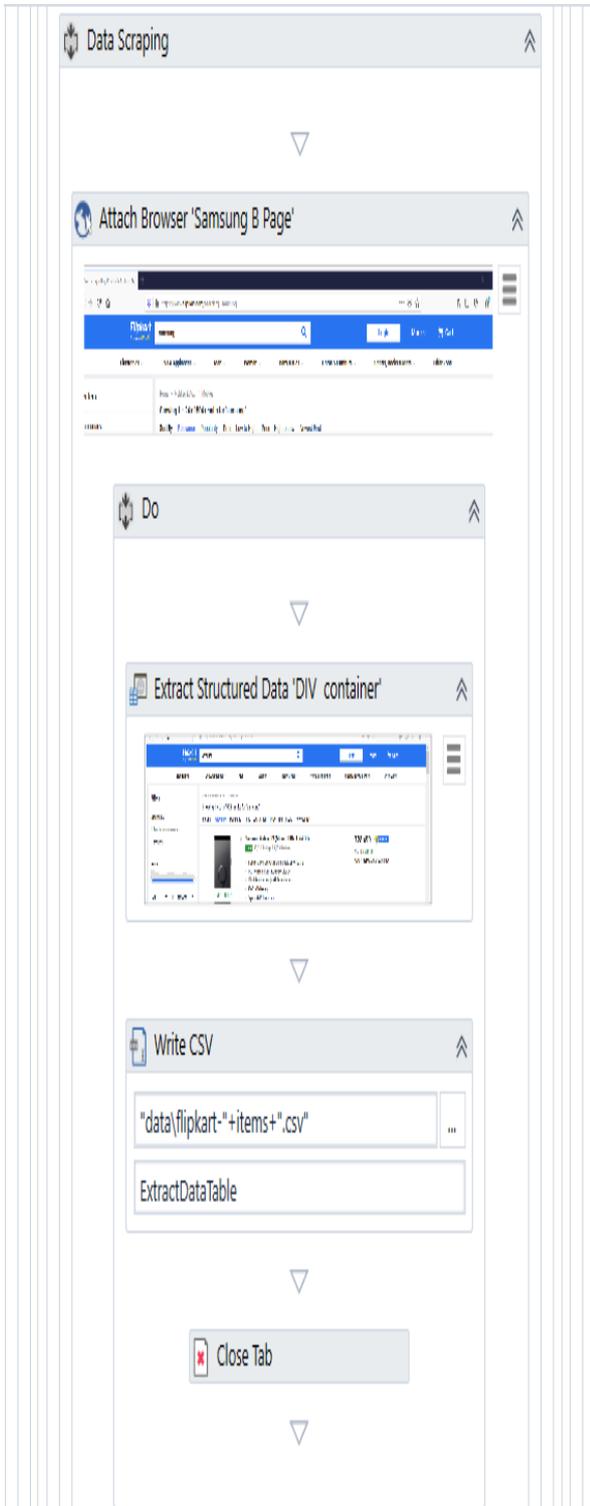
Fig 3 Workflow of web scraping

Fig 4 Workflow of image scraping

III.   EXPERIMENTAL RESULTS

The proposed system successfully collects the details of the product that the user searches for in the web and their Google activity is scraped and stored in the excel file. The collected data is filtered out using machine learning and the product along with its respective image is displayed as an advertisement in users social media account. All the process is done through RPA automatically[5]. Result is shown in fig 5.
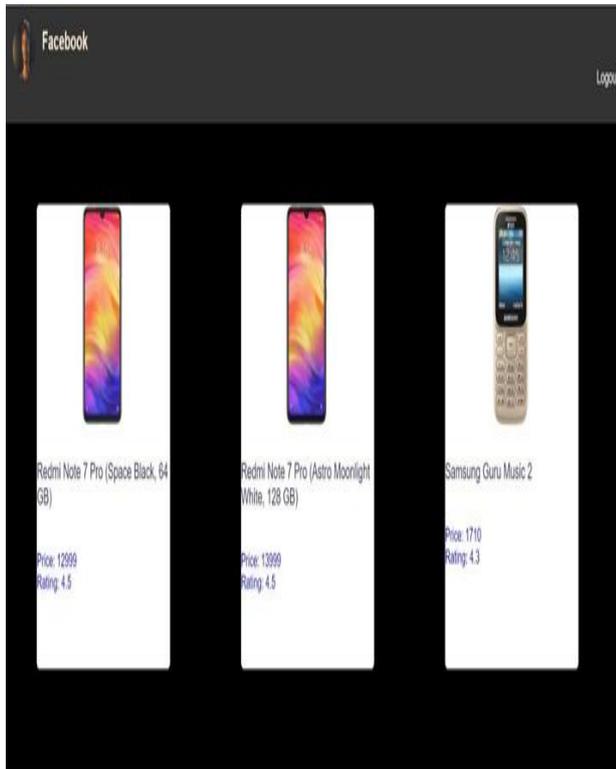
Fig 5 Recommendation of products in the social media user account

REFERENCES

[1] Chaolun ,SaikatGuha,S. Muthukrishnan :Targeting Algorthims for online social advertising markets.
[2] MárioRomao, Carlos J. Costa, Joao Costa: Robotic Process Automation: A case study in the Banking Industry.
[3] SawitaYousukkee: Survey of Analysis of UserBehaviorin Online Social Network,2016.
[4] [S.S.K. RastogiRohitSinghal and Rajeev Kumar: A Sentiment Analysis based   Approach to Facebook User Recommendation,2014.
[5] Audrey Bourgouin, AbderrahmaneLeshob, and Laurent Renard: Towards a Process   Analysis Approach to Adopt Robotic Process Automation, 2018.

IV.   CONCLUSION AND FUTURE WORK

The system successfully helps to reduce the expenditure on human power for making ads template, company's time spending on promoting or advertising their products on social media. The software makes smart advertisers target more users for the given budget, which makes the company maximize the number of reached unique preferred users. Finally, the robot software of prototype recommends the ads without any intervention and manually does in an automated way in social media.

As an enhancement to the completed work, the following tasks are to be undertaken in continuation of this project.

- Product recommendation can be done for different products with different websites so that based on the product name websites can be looped.
- If the products are manufacturing in a particular area then the products can be advertised concerning that area customers who are in social media.
- Improvements to this recommendation method can also be done by considering other elements like named-entities, people and their occupation.

Using Machine Learning, the software can analyze the feeling of the user expressed on topics posted, items "liked" and opinions on the Internet and labelled to classify polarities as positive, negative or neutral which helps to determine a user's attitudes.