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Modernizing Research-Paper Access Operations through RPA

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Abstract

Background/Objectives: Scopus is one of the largest database of peer reviewed literature, research papers, scientific journals, books and conference preceding providing a comprehensive overview of the world's research in the domain of science, technology, medicine, social sciences, arts and humanities. Researchers across the globe are an avid user of Scopus, and the issue they all are facing is that they have to enter each possible keyword to boil down the search results to minimum by trial error method again and again making the process exhaustive, monotonous and mind-numbing. Recalling former search queries after finite amount of time is tedious and mentally taxing. This research has been undertaken to solve this problem. Methods: This research attempts to solve this problem by automating the Scopus website using Robotic Process Automation (RPA), the technology that was solely introduced to prevent repetitive tasks. Findings: The key motivation behind writing this paper is to highlight the fact that, the mentally taxing, monotonous, and time-consuming work reduces the efficiency and innovation of the researcher in the long run. So, the design of the system should be such that their effort gets reduced to a larger extent. Applications: Automation of Scopus using RPA would prove to be an efficient system to ease the work of the researching by reducing the repetitive tasks and improving the efficiency of research across the globe.

Key words: RPA, robotic process automation, Scopus, research database, altimetric.

Introduction

Scopus is a website that is heavily relied upon by millions of researchers across the globe as the source of infinite knowledge in the fields of science, arts, technology, culture, astronomy, spirituality, medicine etc. Researchers are the 'explorers of infinity' with a strong desire to look for definitive and comprehensive answers of some specific questions that could help humanity and this world. The main issue, the researchers are facing while accessing the required references in Scopus is that: The researchers have to enter each possible keyword to boil down the search results to minimum by trial error method again and again making the process exhaustive, monotonous and mind-numbing. Optimised Query findings are time consuming and require sufficient knowledge base. Recalling former search queries after finite amount of time is tedious and mentally taxing. Monotony restricts the cognitive thinking, is often associated with high levels of stress and prevents the victim from being attentive. [Figure 1] shows how our brain reacts to boredom, interest and resting state.

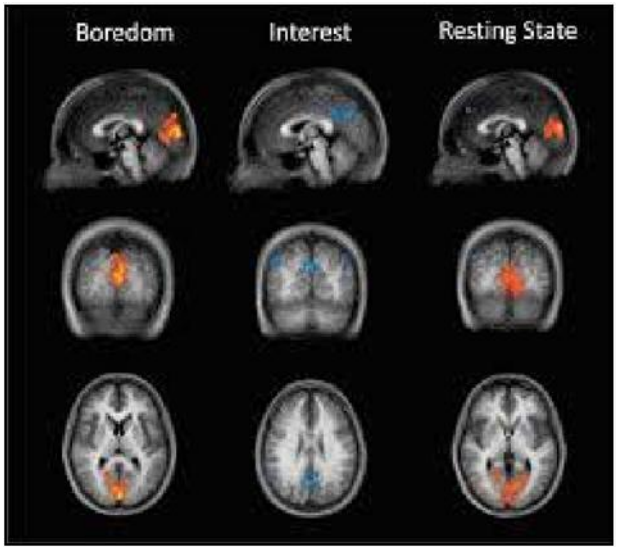


Figure 1: Shows the Reaction of our brain to different states of boredom

Figure1: Reaction of our brain to states of boredom, interest and rest. Retrieved from The bored brain: insular cortex and the default mode network by James Danckert and Julia Isacescu.Previous research, the investigators report in their study paper, has actually suggested that individuals who are often bored are also more prone to poor mental health, and particularly to conditions such as anxiety and depression."People who reports high levels of boredom, monotonicity and propensity have an avoidant disposition. For example, these individuals are more likely to experience depression, ill mental health and anxiety," These tasks causes boredom, anger, monotonicity and reduces the efficiency of research in the long run. Automation of Scopus using RPA is a convenient system to ease the work of the researcher, improve the efficiency and quality of the research, and ameliorate the creative instincts, innovation of the research. This tool is aimed to provide an overall smooth user experience to the researcher. The tool helps the user, to save the optimised former search queries in the tools' personalized storage space [Excel sheet]. With efficient search algorithms, the user can retrieve the queries from the storage as per demand and concatenate with further queries to get the targeted result saving the time of recalling and typing the entire former search query. The tool also provides the functionality of mailing all related documents of the optimized search result to the user's email ID. [Figure 2] shows the flow of execution of the complete system.

The overall equation for complete System can be formulated as:

$$Scopus + RPA = (Efficient + Fast + User\text{-}friendly) * Scopus$$

Researchers are the innovators, the contributing factor behind the exponential growth of technology. Our aim is simple: To automate all those tasks that are: repetitive, no- brainer, and involves little or zero contrivance. These tasks causes boredom, anger, monotonicity and reduces the efficiency of research in the long run. We intend to solve this problem using automation tools such as RPA.

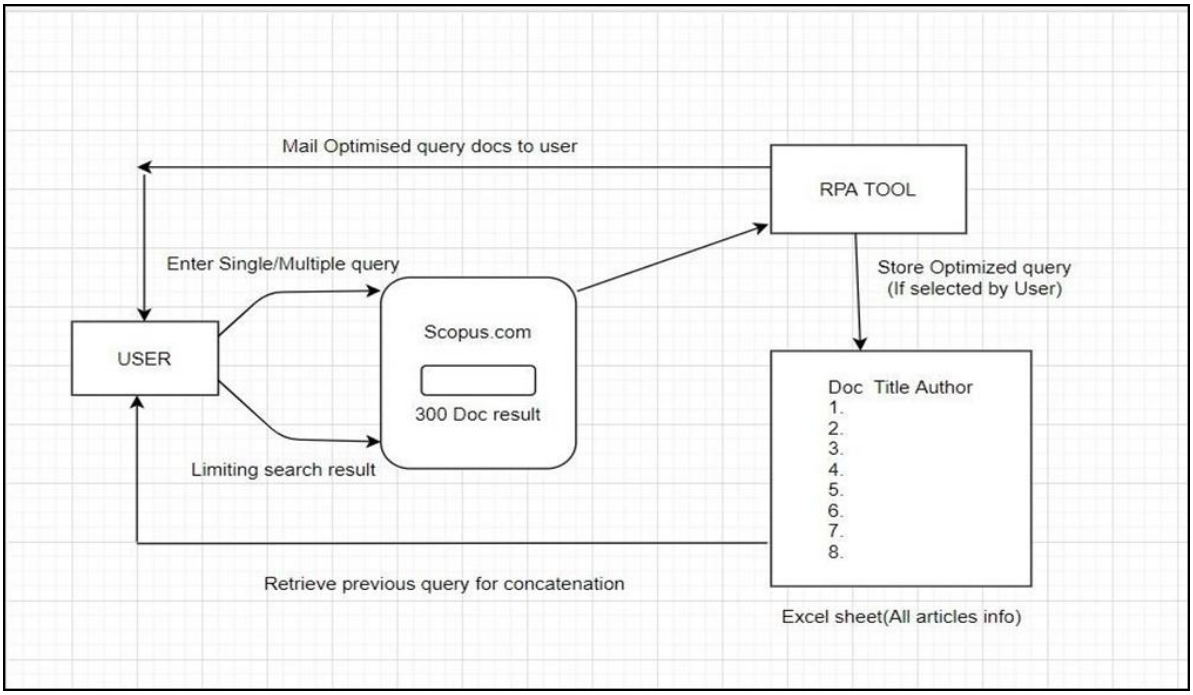


Figure 2: Shows the complete Flow of execution of the system

Scopus

Scopus is a bibliographic database which contains abstract and citation for academic journal articles. It is the largest abstract and citation database of peer-reviewed literature: scientific journals, and books. It contains more than 18000 titles from around 5000 international publishers and includes coverage of 16500 peer reviewed journals in the scientific, technical and medical field. The ability to search both forward and backward from a particular citation would be Very helpful to the researcher. Searches in Scopus also incorporate searches of patent databases. Scopus gives four types of quality measure for each title; those are h-index, Cite Score, SJR (SC Imago Journal Rank) and SNIP (Source Normalized Impact per Paper), journals etc. [Figure 4] shows the clusters and connectivity among various authors, their number of publications and other details that are concerned with the article or research paper.

The Scopus database was queried to understand the current work in RPA. These databases were queried to understand the articles published so far in engineering and computer science domain as the RPA is related field. We applied RPA for automating the process of querying Scopus and hence even the education field was searched to know altimetrics details. But to our surprise found many websites discussing about use of RPA in school and higher education, but found less articles published on the work which we carried out.

The Scopus query is given below as a query, Scopus fetched 255 relevant documents.

```
(TITLE-ABS-KEY("Robotic process automation" or RPA) AND DOCTYPE(ar) AND PUBYEAR > 2015 AND ( LIMIT-TO ( SUBJAREA,"ENGI" ) OR LIMIT-TO ( SUBJAREA,"COMP" ) OR LIMIT-TO ( SUBJAREA,"DECI" ) ) AND ( LIMIT-TO ( LANGUAGE,"English" ) ) AND ( LIMIT-TO ( SRCTYPE,"j" ) ) )
```

The result of the Query grouped by year of publication is shown in [Table 1]

YEAR of publications	No. of Articles
2020	36
2019	73
2018	59
2017	48
2016	39

Table 1: Number of published articles grouped by Year

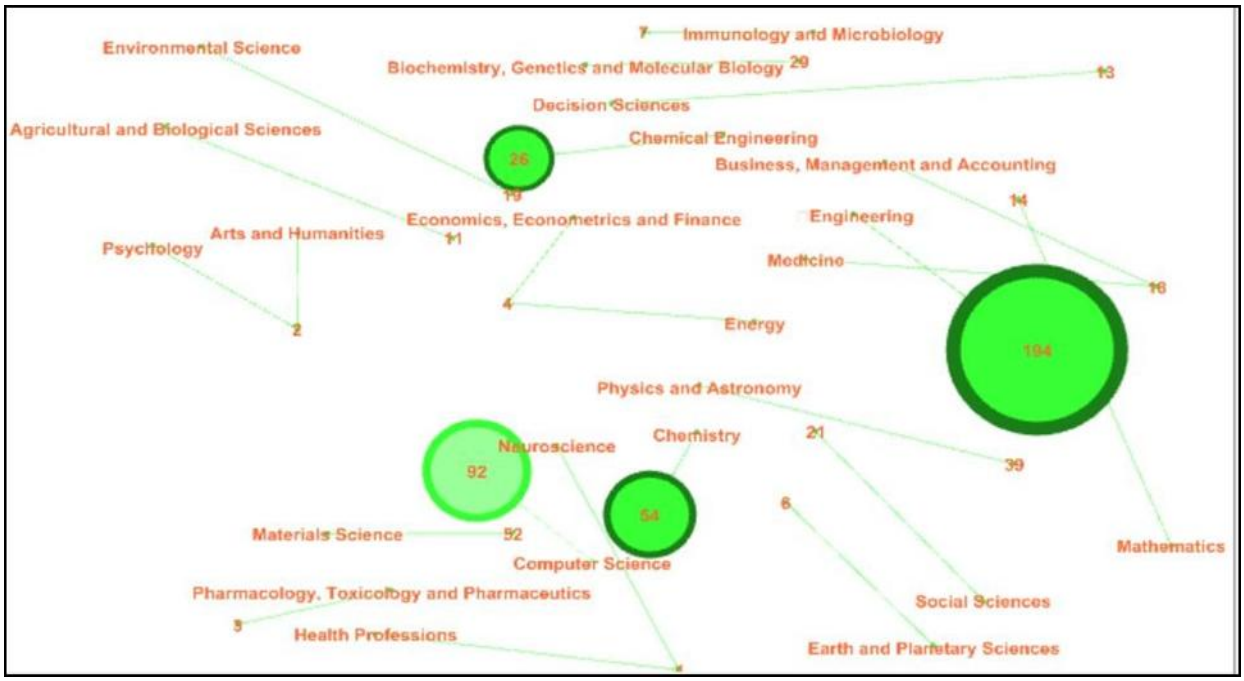


Figure 3: Shows subject areas in which RPA and alike technologies are implemented successfully.

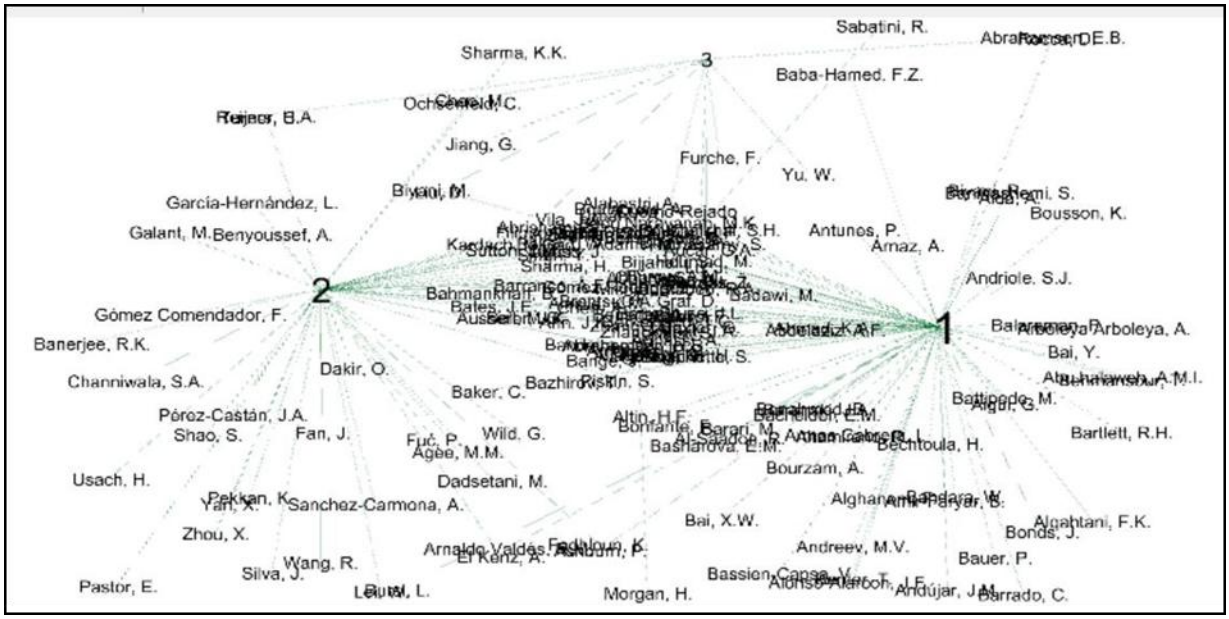


Figure 4: Show the clusters and connectivity among various authors, their number of publications and other details

Robotic Process Automation (RPA)

• Robotic Process Automation (or RPA) is a technology that comprises of software robots which deal with the automation of business process and workflows while allowing the workers to perform high-valued work rather than repetitive, redundant and time consuming and tiring work. RPA has multi- disciplinary technological application that spans through Computer science, electronics and communications as well as in mechanical engineering. [Figure 3] shows subject areas in which RPA and alike technologies are implemented successfully.

• RPA basically is a simple software package that may be implemented to perform all sorts of administrative tasks that otherwise need to stop-gap human processing. There are no specific framework or operating model for RPA and hence it can be modeled for any system specifically.

• The basic difference between a traditional workflow automation tool and RPA is: In a traditional workflow automation software or tool a developer has to configure the tool to perform certain tasks to be automated by the help of specific scripting languages and by using API's to interface between the tool and the application itself. In contrast to this, in RPA tools action are recorded and listed by performing the actions to be automated on the Graphical User Interface (GUI) and recording these actions done by human. This eliminates the need to write complex codes and scripts and actually allowing the workers to automate the workflow easily and efficiently. As RPA is well versed in performing tasks that are repetitive and redundant in nature it is worth noticing that this technology may be the key to all the service based business needs and may even transform to be a compulsion for any business process to grow.

• RPA is capable of taking over the automation of such tasks as it will offer faster and better throughput with more accuracy than any human. It is capable of saving tons of man-hours and thus boosting the workflow process. The workers are freed and can be utilized in a more valuable and interesting tasks. [Figure 5a] shows the difference between the traditional manual systems and automated system.

• To put this into perspective, consider a scenario in a bank where a team of few employees are assigned a task to manually review potentially high-risk client accounts by the help of day to day pairs of transactions to check if payments are processed or not. It might take hours of hardwork or sometimes even days' worth of hardwork to go through all the data depending upon the size of data. This work can be done by let's say 10 computers within limited time and save the workers from all the tiresome work and help them focus in more important work.

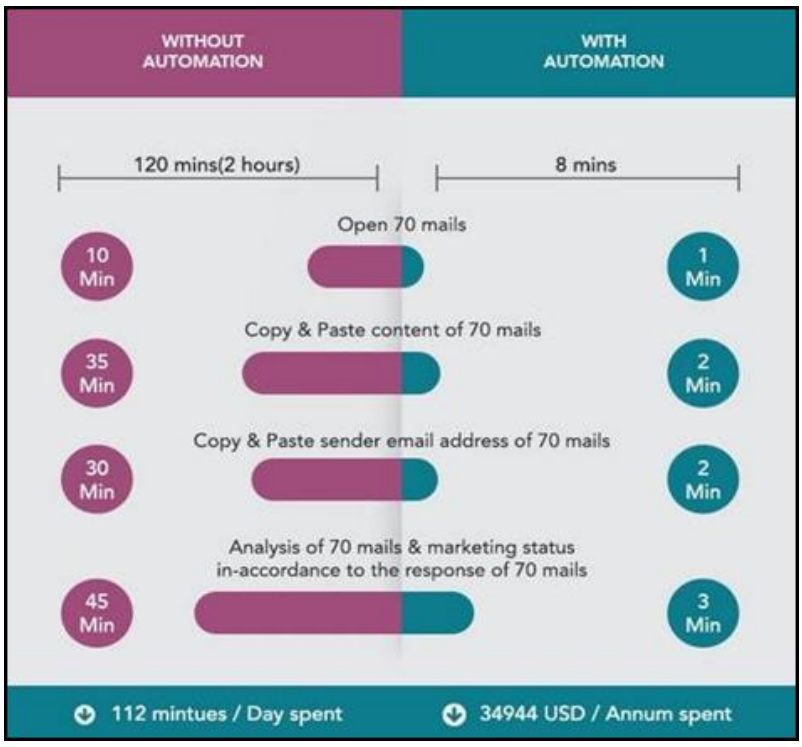
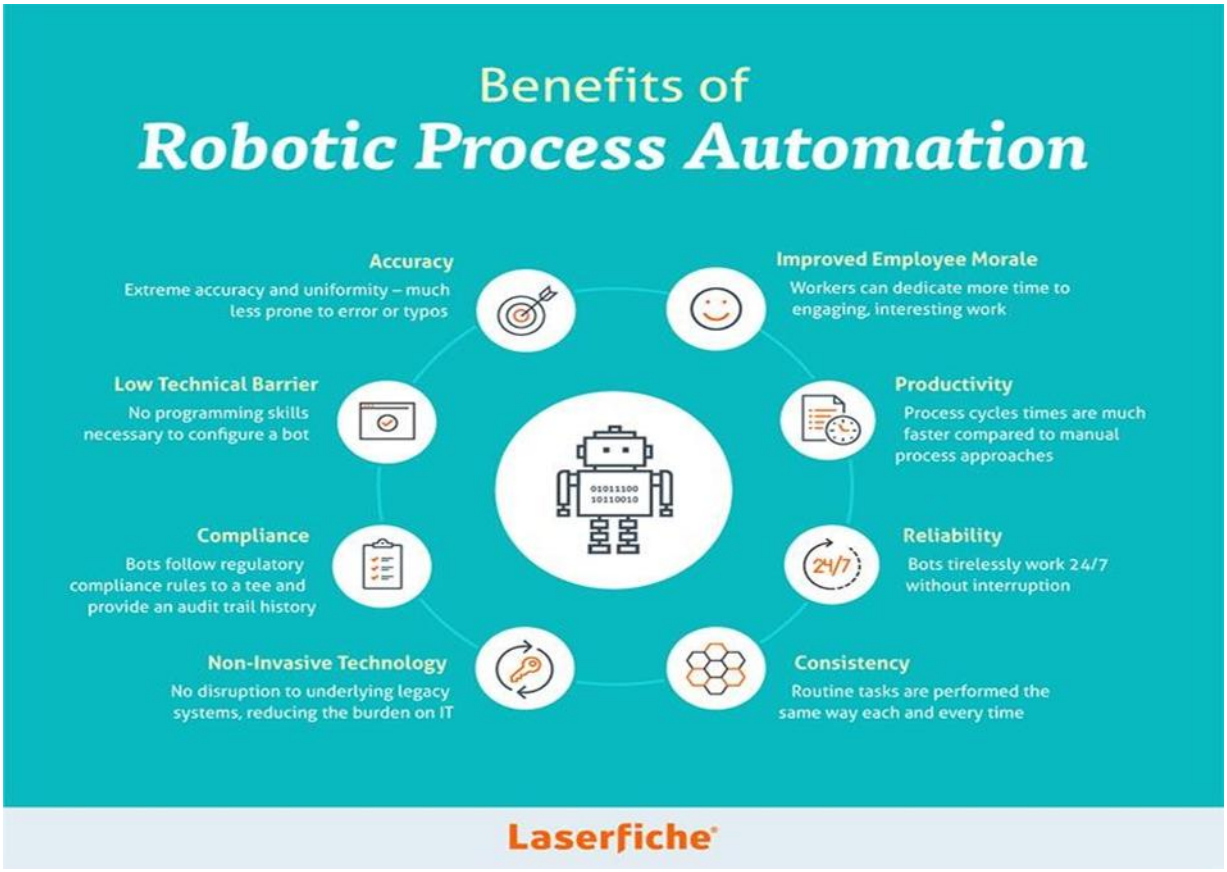


Figure 5a: No Automation vs Automation

• To give an example RPA can be considered as a driverless car and the traditional system can be considered as a car operated by a human. A human merely controls the car by adjusting speed and other controls like changing gears and move from point A to point B, but in case of a driverless car it remembers from the training and not only it applies it to do the needful actions but also it learns and adapts to new things on its own. A robotic driverless car will never lose focus, never do mistakes and never drift away into emotions and these things will not reflect in the operations of the car. Thus, making it more reliable and efficient.

[Figure 5b] shows some of the key benefits of using RPA.



Source: Laserfiche. https://www.laserfiche.com/ecmblog/what-is-robotic-process-automation-rpa/

Figure 5b: Benefits of RPA

How is RPA different from other enterprise automation tools?

- In contrast to other, traditional IT solutions, Robotic Process Automation allows organizations to automate at a fraction of the cost and time previously encountered.

- RPA is also non-intrusive in nature and helps in leveraging the existing infrastructure without Causing disruption to underlying systems.

- With RPA, cost efficiency, compliance, resource requirements, manual labour are no longer an operating cost but a by-product of the automation.

- Helps user to save the Saved Query from Scopus to Excel sheet which make it easier For researchers to search for the specific query from thousands of saved query.

System Architecture

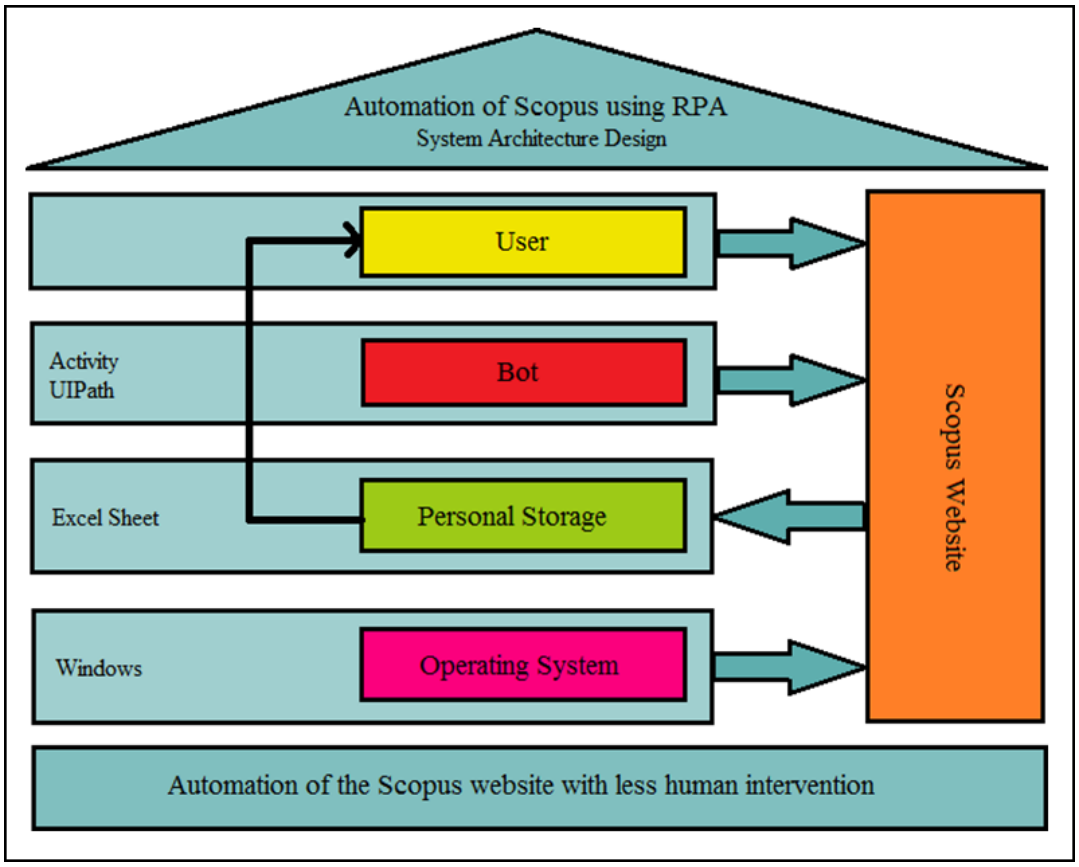


Figure 6: Shows the Architecture Design of Symbi-Scopus

There are four components which are as follows: User, Bot, Personal storage and operating system. [Figure 6] shows the different component in the system.

Scopus Website: Scopus website is where we are performing the automation. User and Bot are the two main components which are interacting with the Scopus and Scopus has direct access to personal storage so that bot can access it.

User: User directly interacts with Scopus website through queries to get access to the peer-reviewed literature and research papers. While writing the query and for concatenation part only user intervention is needed, rest everything is automated by the bot for the user. User does not have the direct access to the personal storage, he can access the data once bot saves the data in excel sheet.

Bot: Bot also interacts with Scopus website directly. UiPath has various activities which help the bot to trigger the automation. The different activities are as follows: selectors, mouse click, and element exists etc. Bot process the automation further once the user part is done and saves the data in user personal storage and signs the user out from the Scopus. Simultaneously, the bot also has this functionality of mailing all related documents to the user in his personal email id.

Personal Storage: Personal storage is the excel sheet where the data is saved by the bot. Scopus has the direct access to personal storage so that bot can save the data in it. And once the data is saved by the bot then only user can access thoseb data. If user wants to enter the same query, which he has already entered in the past or concatenate it with a new query, no need to re- enter it, all he has to do is to find and fetch the query from the personalized excel sheet and his work is done.

Operating System: Here we are using windows operating system 64bit to install UiPath and develop the bot and perform automation. But, our system is compatible with any other OS, provided you install the OS compatible version of UiPath.

Methodology

6.1 Login to Scopus

The first step towards our automation process is login into the Scopus login page where the robot automatically fetches the user credentials and password easing the task of the researcher. Each user will have a unique user id and password. It maintains the secrecy of the data and does not reveal the password So ultimately login activity is automated and eventually saving your time.

6.2 Pop Menu

Once the user signs in to the Scopus, a pop up message box will appear which will ask the user whether he/she wants to enter multiple query or a single query. This pop us message box is what we call the pop up Menu.

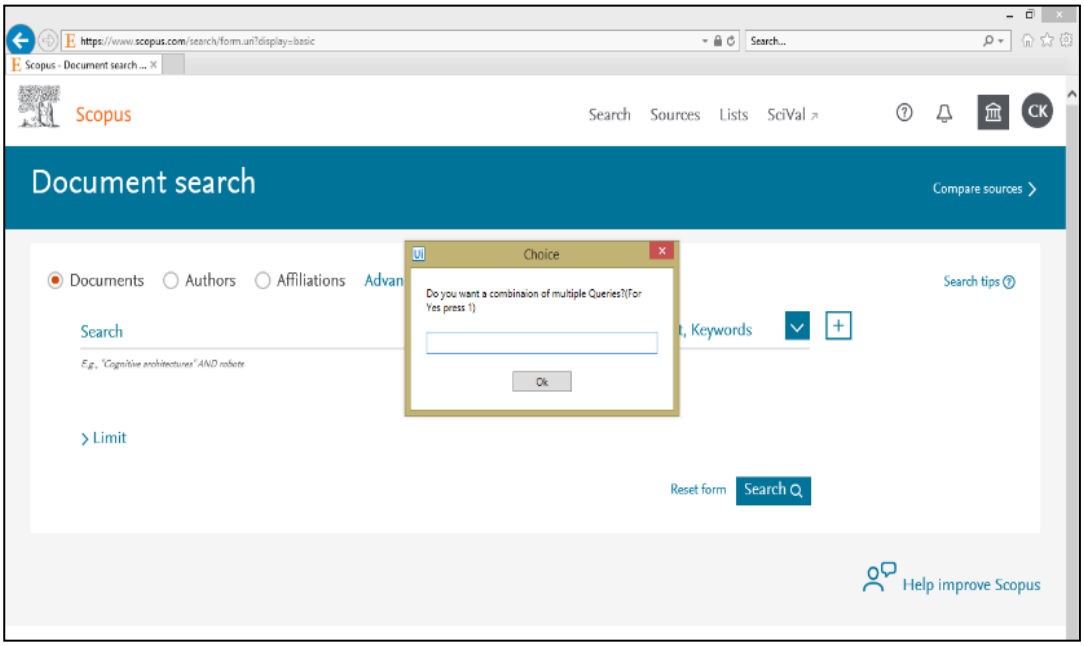


Figure 7: Shows the Pop up message box in the Symbi-Scopus

Multiple Query Functionality

• If user wants to enter Multiple Query he simply has to enter '1'. The pop-up box is shown as in [Figure 7]

If user goes for the multiple query option he has to enter the multiple query again and again in Scopus until he gets the satisfied result. The popup window will always ask the user after each search step whether he got the optimized result/ satisfied result or not, or whether he wants to continue entering different key words for the satisfactory result.

• If user feels that by combining the previous searched query can get him the optimized result when he can perform the concatenation part in Scopus that's why we also keep asking the user(by popup menu) whether he wants to concatenate with previous searched query or want to try different key words. So if user go for the concatenation part then a pop up window will appear and ask him to enter the previous search query id for concatenation. Shown in [Figure 8]. Scopus have a build in feature which keeps the records of the recent searched query with specified query id.

• User have to simply look into the previous searched query data and select the appropriate id for which he wants to perform the concatenation. There is a specific format for that which is as follows:

#(Query ID) AND #(Query ID)
-Here AND is used for the concatenation purpose.

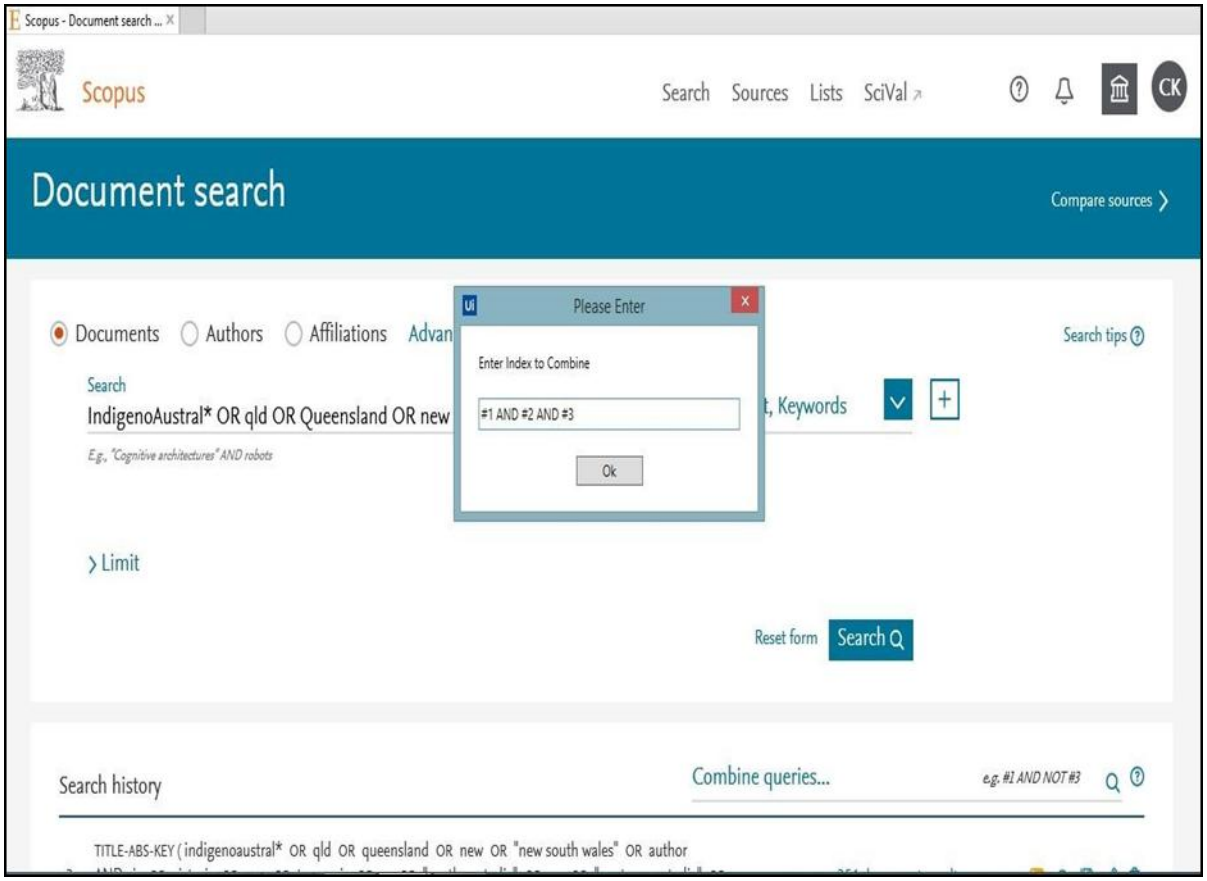


Figure 8: Shows the Multiple query functionality

Single Query Functionality

- If user wants to enter a single query any random number will do followed by enter.

- If user go for the single query then that means that user knows the optimized query already and he just wants to enter the single query and further all the predefined action will be automated which is in detailedmentioned above. [Figure 9] shows the process after single query is selected in the pop-up box in the [Figure 7].

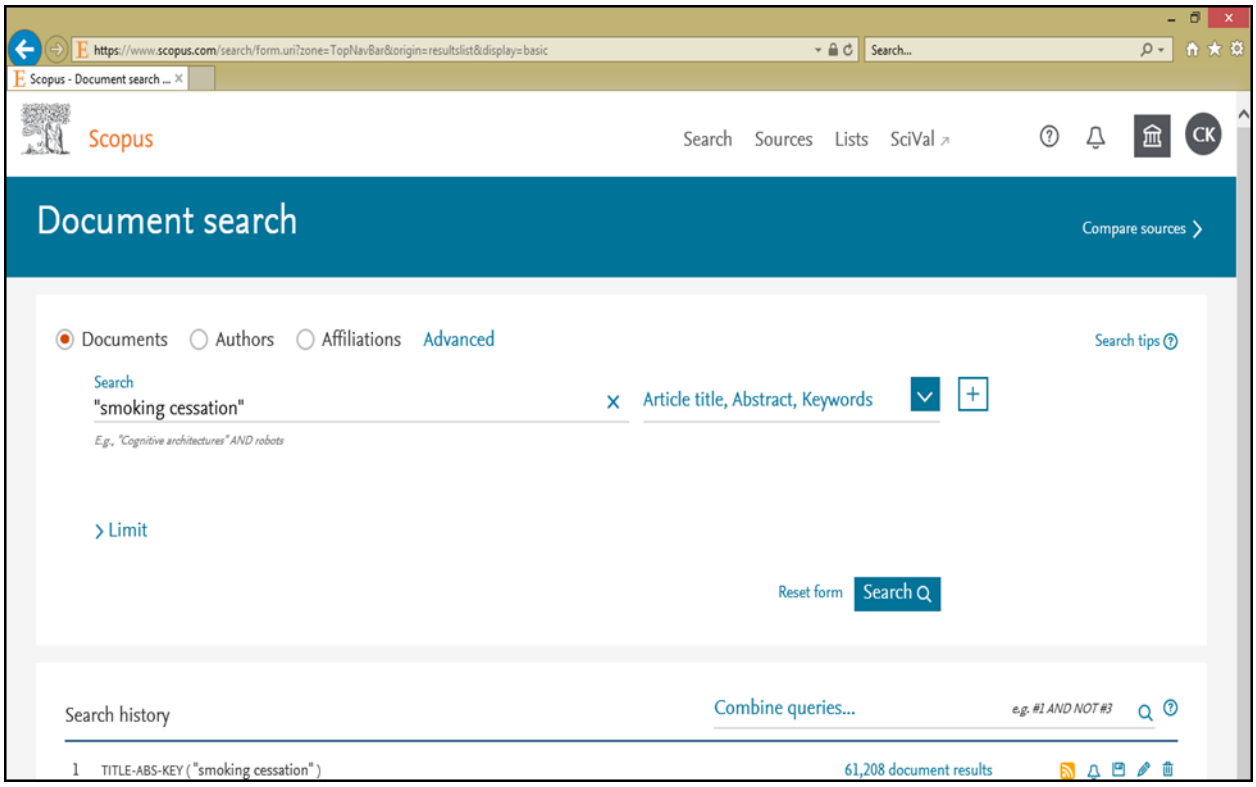


Figure 9: Shows the single query functionality

6.3 Limiting

• There is a built in feature in Scopus which allow the user to further optimize their query which called the limitation part. In limit option it provide various limitation for the user which are as follows:-

- Open Access
- Year
- Author Name
- Subject Area
- Documentation Type
- Publication Stage
- Source title and many more.

• As for entering the query, we need human intervention after that everything is fully automated as the further process is predefined by the user already for automation purpose and that's why further we don't require any human intervention. And also further process are repetitive task that user performs when he get the optimized output.

6.4 Email

• After getting the final output and when user confirms that he got the output what he intended to then we save the final query in excel sheet (Personalized storage) and email the information related to the output to user's personal email id.

• While sending the mail also we send only those specified information that user wants to get received, we automated that part also so that every time user don't have to do the same thing quite often.

• Thus, this feature comes handy to the user.

6.5 Citation

Scopus's Citation Overview is a way for you to find and track citation data generated from a set of selected documents. If you select the publications of an author indexed in Scopus then you can make use of the Citation Overview feature to get citation information of the set of documents written by this author, such as: ([Figure 10] shows the overview of citation)

• a list of document in the set

• total number of citations per document (with or without self-citations)

• total number of citations per document in particular years

• H-index: - The h-index is an index that measures the productivity and impact of the published work of a scientist or scholar. In Scopus, the h-index is not a static value as like others, it is calculated live on a set of results each time you look it up.

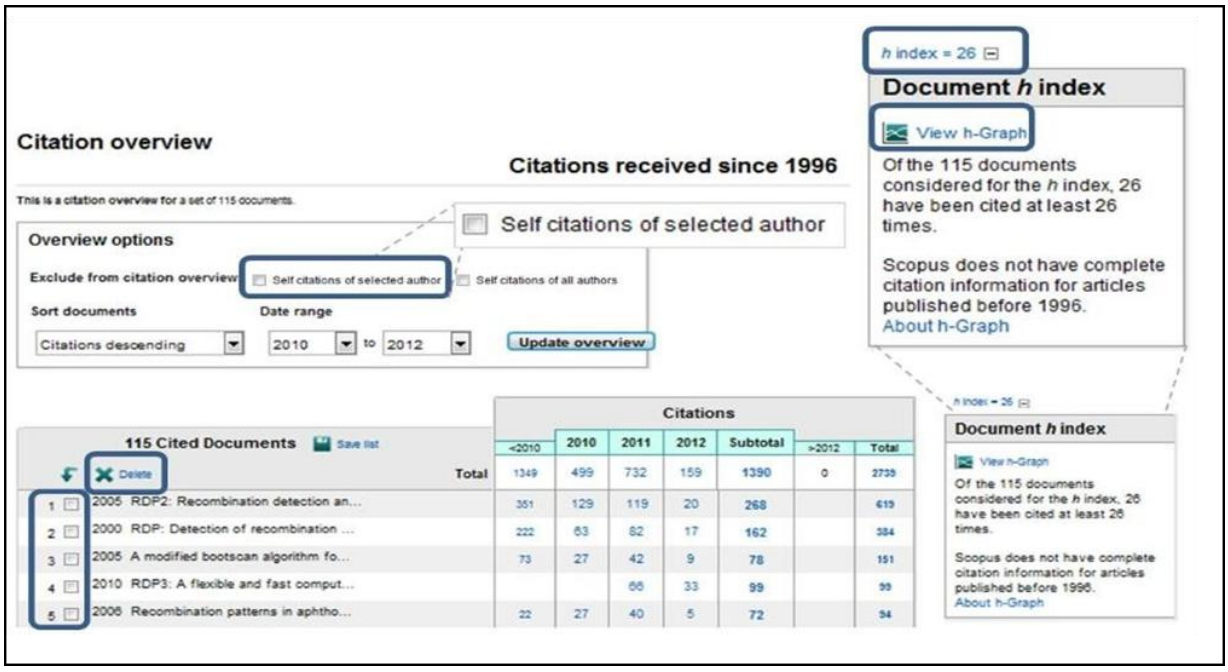
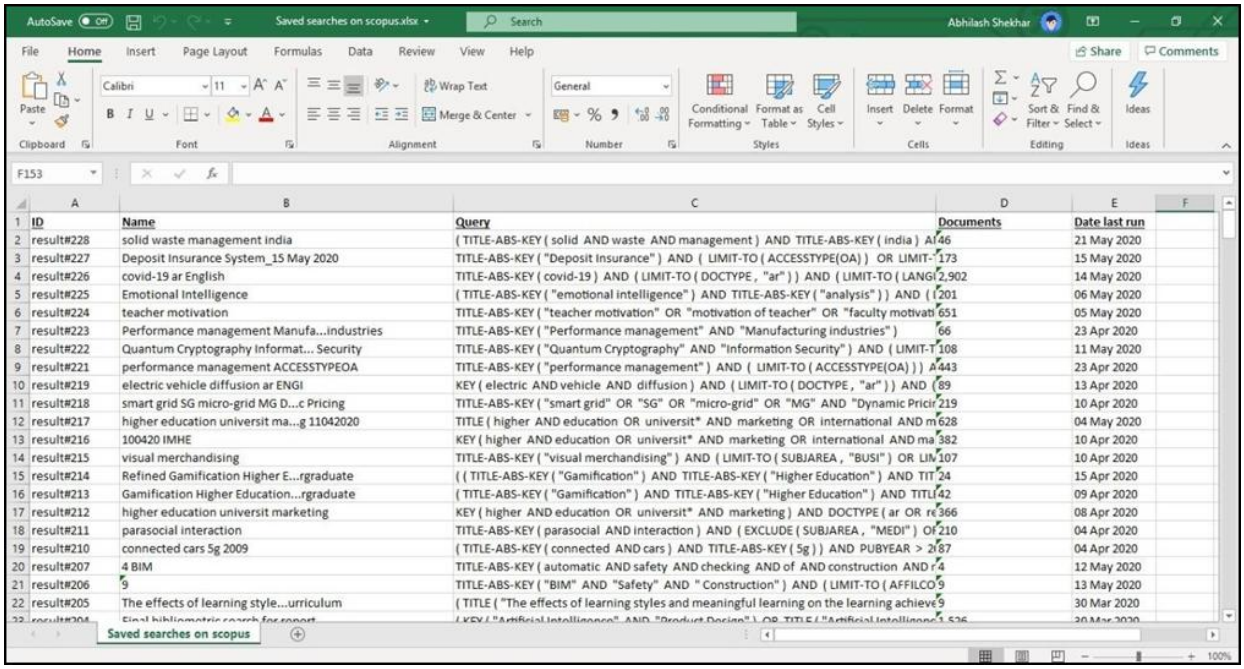


Figure 10: Shows the Citation Overview



ID	Name	Query	Documents	Date last run
result#228	solid waste management india	(TITLE-ABS-KEY (solid AND waste AND management) AND TITLE-ABS-KEY (india) AI	46	21 May 2020
result#227	Deposit Insurance System_15 May 2020	TITLE-ABS-KEY ("Deposit Insurance") AND (LIMIT-TO (ACCESSTYPE(OA)) OR LIMIT-	173	15 May 2020
result#226	covid-19 ar English	TITLE-ABS-KEY (covid-19) AND (LIMIT-TO (DOCTYPE , "ar")) AND (LIMIT-TO (LANGI	2,902	14 May 2020
result#225	Emotional Intelligence	(TITLE-ABS-KEY ("emotional intelligence") AND TITLE-ABS-KEY ("analysis")) AND (	201	06 May 2020
result#224	teacher motivation	TITLE-ABS-KEY ("teacher motivation" OR "motivation of teacher" OR "faculty motivati	651	05 May 2020
result#223	Performance management Manufa...industries	TITLE-ABS-KEY ("Performance management" AND "Manufacturing industries")	66	23 Apr 2020
result#222	Quantum Cryptography Informat... Security	TITLE-ABS-KEY ("Quantum Cryptography" AND "Information Security") AND (LIMIT-T	108	11 May 2020
result#221	performance management ACCESSTYPEOA	TITLE-ABS-KEY ("performance management") AND (LIMIT-TO (ACCESSTYPE(OA))) A	443	23 Apr 2020
result#219	electric vehicle diffusion ar ENGI	KEY (electric AND vehicle AND diffusion) AND (LIMIT-TO (DOCTYPE , "ar")) AND	89	13 Apr 2020
result#218	smart grid SG micro-grid MG D...c Pricing	TITLE-ABS-KEY ("smart grid" OR "SG" OR "micro-grid" OR "MG" AND "Dynamic Prici	219	10 Apr 2020
result#217	higher education universit ma...g 11042020	TITLE (higher AND education OR universit* AND marketing OR international AND m	628	04 May 2020
result#216	100420 IMHE	KEY (higher AND education OR universit* AND marketing OR international AND ma	382	10 Apr 2020
result#215	visual merchandising	TITLE-ABS-KEY ("visual merchandising") AND (LIMIT-TO (SUBJAREA , "BUSI") OR LIM	107	10 Apr 2020
result#214	Refined Gamification Higher E...rgraduate	((TITLE-ABS-KEY ("Gamification") AND TITLE-ABS-KEY ("Higher Education") AND TIT	24	15 Apr 2020
result#213	Gamification Higher Education...rgraduate	(TITLE-ABS-KEY ("Gamification") AND TITLE-ABS-KEY ("Higher Education") AND TITL	42	09 Apr 2020
result#212	higher education universit marketing	KEY (higher AND education OR universit* AND marketing) AND DOCTYPE (ar OR re	366	08 Apr 2020
result#211	parasocial interaction	TITLE-ABS-KEY (parasocial AND interaction) AND (EXCLUDE (SUBJAREA , "MEDI") OR	210	04 Apr 2020
result#210	connected cars 5g 2009	(TITLE-ABS-KEY (connected AND cars) AND TITLE-ABS-KEY (5g)) AND PUBYEAR > 2	87	04 Apr 2020
result#207	4 BIM	TITLE-ABS-KEY (automatic AND safety AND checking AND of AND construction AND r	4	12 May 2020
result#206	9	TITLE-ABS-KEY ("BIM" AND "Safety" AND " Construction") AND (LIMIT-TO (AFFILCO	9	13 May 2020
result#205	The effects of learning style...urriculum	(TITLE ("The effects of learning styles and meaningful learning on the learning achieve	9	30 Mar 2020

Figure 11: Shows how Data is saved and presented inside Excel sheet

6.6 Saved Search

Saved search is something that Scopus have built in feature were all the saved query is saved, it is just like an archive in mail where we can keep the important mails, similarly here also user can save the query in Scopus. [Figure 11] shows how data is stored in the excel file.

Drawback of saved search: If user want to search the specific query in Scopus then he have to search line by line each query which is quit tedious and time taking because there could be millions of saved query and there is no feature available for user to simplify the searching.

To overcome that problem:

- We automatically save the Saved Search data to an excel sheet and all the data is saved in tabular form containing the same information that Scopus have, so that user can simply search the query by pressing Ctrl+F and enter the keyword for the query that he intends to search in worksheet. And the best part is that it not only reduces the search time but also makes it easier for the user for concatenation part also.

- Suppose user wants to concatenate the different query as per his requirement to see if he get the desired output then he can simply search for that keyword in excel sheet by simply pressing Ctrl+F and note down just the query id because only query id can help user to concat different query in Scopus which therefore reduces a lot of hard work.

Algorithm

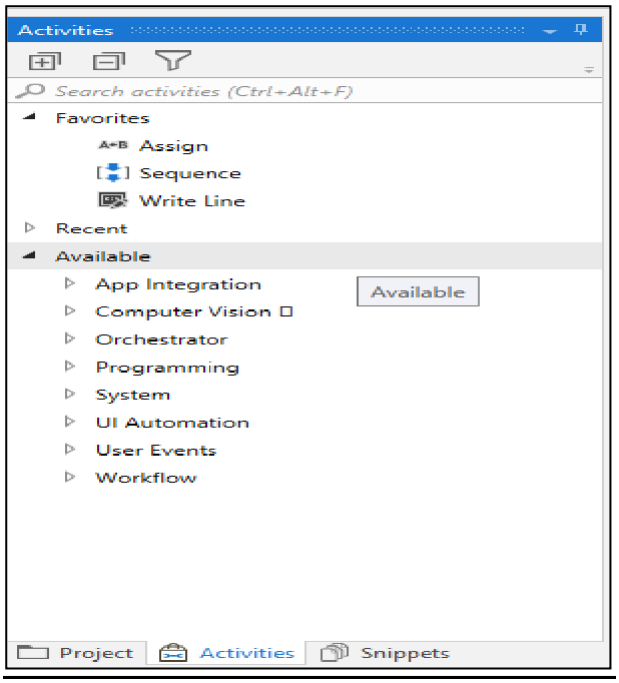


Figure 12: Various Activities in UiPath

UiPath has a built in feature which allows user to perform the coding part in form of activities. UiPath provides many activities which helps the bot to perform the automation. The activities are as follows: App Integration, Computer vision, Programming like selector, click, and element exist etc. Example shown in [Figure 12].

Step 1: At first bot will trigger the open browser activity where user has trained the bot by mentioning him which website to open. Here bot will open the welcome page.

Step 2: After that bot will trigger again the open browser activity, but this time it will open Scopus website. And enter the login details as mentioned by user while training the bot. It uses the html tag for that and css selector, mouse click and send hotkey activity. Everything is performed in try catch so that if bot is unable to fetch the login detail then it will ask the user to restart the automation. This is a part of exception handling of the bot.

<html url='*www.scopus.com*'/>

<webctrl parentid='signin_link_move' tag='SPAN' />

Step3:Pop-up window will triggered asking user whether he want to perform multiple queries, concatenation part or want to perform single query.

If(user enters 1){

//perform multiple query concatenation

}else{

//perform single query

}

In if else this action will be performed, if user press 1 the multiple query will be perform and entering any random number will perform single query.

Step 4: All the activities are in a sequence form which imitates the user work. These are stored in the UiPath console as a road map for the RPA tool, what action to be performed next and so on. The algorithm follows the top down method where sequentially all the activities will be triggered.

Step 5: The bot performs the automation sequentially, one by one and triggers each code (in form of activity) to perform the automation. Thus instilling the feeling of 'automation' to the user.

Step 6 (Saving into the personalized storage): After entering and concatenating the query again and again to get the optimized result, the user is given a choice whether he wants the optimized query to get saved in the excel sheet or he wants to further concatenate if not satisfied yet.

If(yes by the user){

//optimized query gets saved in the personalized storage.

}else{

//ask the user to concatenate further.

}

Step 6: UiPath Selectors helps in click option, opening browser helps in opening the browser, element exist check whether the defined element is exist when page change or not, performing exception with exception handling activity, and so on. All these actions take place step by step.

Step 7: While performing the automation sequentially if any of the activity fails (either due to slow internet or some other reason) the bot keeps on trying until that particular element is found but after certain time if that element is not found then the automation terminates and the process stops.

Step 8: If Bot throw no error then it will go back to step 7 and perform the automation normally.

```
Algorithm (Symbi-Scopus){

//ask user to enter the option- single or multiple
query

Boolean automation= true;
While (automation is running)
{
   Do
  {
      If (user enters 1){
        //perform concatenation of multiple
queries and get relevant document results from
scopus
       }
        Else {
        //perform single query and get relevant
document results from scopus
         }
    } while (user choses to concatenate further)
```

```
//save the optimized query into the personalized
storage by the bot

If(element not found after certain timeout)
    {
    automation=false;
     //automation stops
     }
}
}
```

Comparative analysis

• The system developed replaces the traditional manual overhead of the researchers of going back and forth to find an optimized query and sending all details like citations, publisher, author, institute, funding agencies, etc. about the resulting articles directly to their email. The traditional manual work is done by automated bots and thus we see an increase in efficiency of researchers. Automating this process eliminates the need of training the researchers in the usage of such databases to fetch the desired results by using different keywords and filters.

• The system in contrast to the existing manually working system helps the researcher to focus on the things that are important and helps them to focus on research rather than doing the repetitive task again and again.

• The optimized query need not be written down like before as is it stored in the system itself for further reference of the user. Saving the query may introduce the demand for some space on the local system but it is a good bargain against writing it down or memorizing it like before. It is also easy to find the query from multiple queries by just using the search feature in

excel rather than turning pages on the handwritten notepad or notebook making it more efficient and time saving.

• Various tools like Blue Prism, Automation Anywhere, and UiPath etc. can be used to automate the process. This system uses UiPath providing the user with minimal installation of various software as UiPath provides Orchestrator which runs on the server eliminating the need for processing power from the local system.

Comparative analysis on Scopus over Automated Scopus using RPA?

Various databases like Scopus are made available to the researchers to easily access the contents of the article, articles, journal details, highly cited authors, research dominating institutes, funding agencies etc. The data which is available on these databases are so huge, that generally at initial research phase, the scholar need to go through training of these databases to fetch the required details. This teaching learning process is time consuming. Apart from that an individual researcher uses such database tools frequently with varied keywords and with specific aim related to research. To avoid researchers spending on these repetitive tasks, we have constructed the RPA based tool, that automate the Scopus to reduce the repetitive task .This will definitely motive all the researchers to spend more time on their work, rather than looking for apt article on such databases.

Validation

The system is highly dependent on internet connection and if due to slow or no internet connection the page is unable to load then the bot will not be able find the button on the page and the system will not produce the intended output. The selector can sometimes not select the proper button with change in the dynamics of the page and should be reconfigured to continue working smoothly. To produce the intended results the human intervention should be limited to ensure that the operation sequence of the bot is not affected.

If these conditions are followed the system will produce the intended result in an efficient and time saving manner. The intended results being

— all the details such as author information, publication of the paper, citation information, etc. of the research papers that were selected by the query entered. The results are accurate almost every time as UiPath claims the accuracy of the bots to be around 90%.

Conclusion

Various databases are made available to the researchers to easily access the contents of the article, articles, journal details, highly cited authors, research dominating institutes, funding agencies etc. The data which is available on these databases are so huge, that generally at initial research phase, the scholar need to go through training of these databases to fetch the required details. This teaching learning process is time consuming. Apart from that an individual researcher uses such database tools frequently with varied keywords and with specific aim related to research. To avoid researchers spending on these repetitive tasks, we

have constructed the RPA based tool. This will definitely motive all the researchers to spend more time on their work, rather than looking for apt article on such databases. This way definitely the productivity of motivated researcher will increase multi folds due to this user-friendly tool development. "Cherry on Cake" is to receive updates on your specific search on Scopus, in the form of mail, which indicates the use of ML concepts along with RPA, as this developed tool has the capability to remember the searches done on Scopus by specific user, his / her mail id and then moment new article is made available in Scopus database the researcher is informed automatically. This adds additional level of details to RPA.

Future Scope

- To incorporate deep learning techniques to improve search.

- This would help the researchers to know about the latest trends in technology and proceed accordingly.

- Machine learning tool which will also give the country wise research percentages that will help the researchers to know the research trends specific to countries, help students select universities for their PHDs and much more.

- Making our robot live so that it keeps only the updated data.

- Making robot run at least two times a week or as per user wants so that it keep giving user alert as per user need

- Automating other search websites like Web Of Science, Pubmed, Eric, IEEE Xplore, ScienceDirect, Directory of Open Access Journals(DOAJ), JSTOR etc also so that user gets all the information from other website also.

- In near future, RPA will be implemented on various other open source tools which provides valuable information for the researchers

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