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Innovative Journal Finder System: Enhancing Research Outcomes in Higher Learning Institutions through WOS and Scopus Integration

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ABSTRACT

In the current landscape of academic research, the ability to identify suitable and credible journals is critical for disseminating research effectively. This paper presents the development of a Journal Finder System that integrates Web of Science (WOS) and Scopus databases to enhance the journal selection process for researchers at higher learning institutions. The system aims to streamline journal discovery by leveraging metadata and citation analysis from these reputable indexing platforms to ensure that researchers can target journals that align with their work's scope and quality. Additionally, the system incorporates mechanisms to filter out predatory journals, which have become a growing concern in the academic publishing landscape. The methodology use is a qualitative method for system development. A case study conducted within a higher learning institution demonstrates the effectiveness of the system in improving research visibility and publication success. The findings highlight how integrating advanced search algorithms and trusted journal databases can significantly reduce the time and effort spent in identifying appropriate journal and publication area, ultimately leading to higher research output and academic recognition.

1. Introduction

In the realm of academic research, access to reputable and high-impact journals is paramount. The Web of Science (WOS) and Scopus are two of the most prestigious and comprehensive databases that provide researchers with a vast array of scholarly articles and journals. These databases are essential for ensuring that researchers can find relevant, high-quality literature to support their work.

Recently, most of the scholars, researchers and academicians use Web of Science (WoS) and Scopus database as their source for retrieving a paper from the respective journal for the academic purpose [1]. Web of Science (WoS) and Scopus are the two primary citation and indexing databases

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which have coverage of LIS literature and are widely used to evaluate journals in the discipline based on their production as well as the total number of citations received in order to determine its impact, influence, or status [2].

Both databases allow users to search articles on a topic, track the scholarly impact of a journal or individual author, and retrieve a list of journals in the specific field and area. These databases have become essential tools for researchers, librarians, and policymakers to track scholarly output, assess research impact, and inform funding and promotion decisions [2]. Two mains databases, Scopus and Web of Science (WoS), were utilised for this purpose, and they are widely acknowledged as prominent databases especially in the field of systematic review due to their extensive coverage and advanced search functionalities [3]. According to Abrizah *et al.,* [4], several journal-level metric tools are mostly generated from these two major indexing databases. There are several metrics in use and include Journal Impact Factors (JIF), CiteScore, Article Influence Factor, Eigenfactor (EF), Source Normalized Impact per Paper (SNIP), Scimago Journal Rank (SJR), h-index, i-10 index, Altmetric Attention Score, and PlumX metrics among many others [4].

Accordingly, the objective of this paper is that to explore the development of the automated system name as journal finder which is can be used by academicians especially lecturers and students of post-graduate at University Poly Tech Malaysia, UPTM. The purpose of the study is also to provide the system that acts as a database source for WOS and Scopus papers. Yet, the accessing of this type of databases has been an issue for certain academician. This could due the retrieving procedure provided by the databases and the subscription process by organization and institution. These challenges might affect the user in terms of to obtain their journal and papers from this source. Thus, one alternative and to overcome the problem is that trying to develop an automated system which is can access the reputable journal whether Scopus or Web of Sciences. This system aims to facilitate easier access to relevant journals, thereby enhancing the efficiency and effectiveness of research activities at higher learning institutions. The system could assist them for doing a literature review and afterword for further publication of papers in Web of Science and Scopus indexed reputable journal.

2. Literature Review

Web of Science which is from Thomson Reuters was the only citation database and publication which covered all domains of science for many years According to Chadegani *et al.,* [5], WOS from Thomson Reuters (ISI) was the only citation database and publication which covers all domains of science for many years [1]. However, Elsevier Science introduced the database Scopus in 2004 and it is rapidly becoming a good alternative [6].

Scopus, officially named SciVerse Scopus, has introduced by Elsevier in November 2004 to the information market [7]. Furthermore, Scopus is a huge multidisciplinary database with citations and abstracts from peer-reviewed journal literature, trade journals, books, patent records, and conference publications [6]. It provides tools for tracking, analysing, and visualizing search results. Scopus launched in November 2004 and it is the largest abstract and citation database. Scopus database is the largest searchable citation and abstract source of searching literature which is continually expanded and updated [8].

With over 21,500 titles from more than 5,000 international publishers, Scopus delivers the most comprehensive overview of the world's research output in the fields of science, technology, medicine, social science and arts and humanities. Scopus covers more than 49 million records including trade publications, open-access journals, and book series [9]. Almost 80% of these records include abstract. It contains 20,500 peer-reviewed journals from 5,000 publishers, together with

1200 Open Access journals, over 600 Trade Publications, 500 Conference Proceedings and 360 book series from all areas of science[10,11].

3. Methodology

The research design for this study is a combination of descriptive and experimental approaches. The descriptive aspect involves analyzing existing journal selection tools and understanding user requirements, while the experimental part focuses on developing and testing the Journal Finder System [12]. The overall methodology used in this research is a qualitative approach which is implied the process in the development phase [13]. The first part of descriptive aspect outlines the foundation for the study which is a comprehensive literature review was conducted.

This involved analyzing existing research papers, articles, and case studies related to journal selection tools, WOS and Scopus databases. The literature review helped identify common features, limitations, and areas where improvements are needed in existing systems [14,15]. To capture the perspectives of potential users, online surveys and in-depth interviews were also conducted. The surveys targeted a wide range of researchers including lecturers at UPTM, seeking to understand their current practices, challenges, and desired features in journal selection tools. Concurrently, in-depth interviews with a smaller group provided qualitative insights, allowing for a nuanced understanding of user needs.

To clarify the experimental approach in the developmental phase of the Journal Finder, the Figure 1 diagram below is a flowchart for the workflow involved in the system.

Fig. 1. System workflow for journal finder

The workflow of the system begins with the input from the user. The user requests allow the user to search the publications related to a specific topic. For this purpose, users interact with the system through a web-based interface where they input their search criteria, such as keywords, subject areas, and impact factors. Upon submission, the search request is transmitted to the backend server. The Journal Finder System leverages the APIs provided by the Web of Science (WOS) and Scopus databases to facilitate efficient and accurate journal selection for researchers [16,17].

By using API gateway tool, it receives the request and validates or authenticates it [18]. The query builder is to construct appropriate queries for Scopus and WoS APIs. The backend server, implemented using Flask, handles the incoming search request [19]. It processes the search criteria and prepares API requests for both WOS and Scopus [19]. This preparation includes authenticating with the APIs using secure keys and constructing precise queries [20]. In term of API

communication, the system sends the prepared API requests to the WOS and Scopus databases. Each request includes the constructed query and necessary authentication details.

The APIs then process these requests and return responses containing relevant journal metadata [21]. Meanwhile, the data fetcher sends requests to Scopus/WoS APIs in order to retrieve responses [21]. Finally, the response parser will parse the responses and formats data into JSON/XML [21]. Otherwise, the backend server receives the responses from both WOS and Scopus APIs. These responses are parsed to extract critical information, such as journal titles, impact factors, subject areas, and publication details.

4. Results

This section will deliberate the result from the development part that has been discussed in the previous section. It then follows a screenshot of a Journal Finder System. Overall, the overview of the system performance for Journal Finder System was evaluated based on several performance metrics, including response time, accuracy of results and system reliability. The following key performance indicators were measured which is illustrated in the Table 1. It is shown that the evaluation of performance metrics has met the requirement of the system.

Table 1
System performance indicator

Indicator	Performances
Response Time	The average time taken to retrieve and display search results was 3.2 seconds.
Accuracy of Results	The system successfully retrieved relevant journals that matched the search criteria in 95% of test cases.
System Reliability	The system maintained a 99.8% uptime during the testing period.

Other than that, the user feedback and usability testing has also been conducted. To assess the usability and user satisfaction, a group of 200 researchers includes lecturers and post graduate students of UPTM from various academic disciplines and academic programmed were invited to use the Journal Finder System. Their feedback was collected through surveys and interviews, focusing on ease of use, interface design, and overall satisfaction.

Table 2
Usability testing

Item	Responses
Ease of Use	92%
Interface Design	89%
Overall Satisfaction	94%

Table 2 represents the feedback of users from the usability testing. The usability items categorized in the ease of use are interface design and the overall satisfaction. From the result it has shown that 92% of users found the system easy to navigate and use, 89% of users rated the user interface as intuitive and visually appealing and majority 94% of users expressed satisfaction with the system, citing its efficiency and relevance of search results as a major benefit.

In a comparative analysis, the Journal Finder System was evaluated against three existing journal selection tools. The system excelled in functionality, offering advanced search filters and

superior integration with WOS and Scopus. User experience ratings were higher for the Journal Finder System, particularly in ease of use and interface design. Performance metrics also showed the system outperforming existing tools in response time and accuracy of results. Table 3 shows the comparative analysis of Journal Finder System.

Table 3
Comparative analysis

Metric	Journal Finder System	Tool A	Tool B
Response Time (seconds)	3.2	5.4	4.8
Accuracy of Results (%)	95	87	90
User Satisfaction (%)	94	80	85

Meanwhile, Figure 2 and Figure 3 depict the interface of the Journal Finder System. The main interface is very important as they act as an interface in order user interacts with the application.

Fig. 2. Main interface – Journal Finder System

Fig. 3. About us page – Journal Finder System

Next, Figure 4 illustrates the interface which is user can search for the journal name, article title and author name for the paper. If the user enters the journal name which is illustrated in the Figure 5, the total number of journals exist in the database depends on the request of API gateway at backend system. For instance, Figure 5 shows that the number of 93 journals exists for the Journal of Computing with the information about coverage years, cite score and links. Meanwhile, the source details are illustrated in Figure 6.

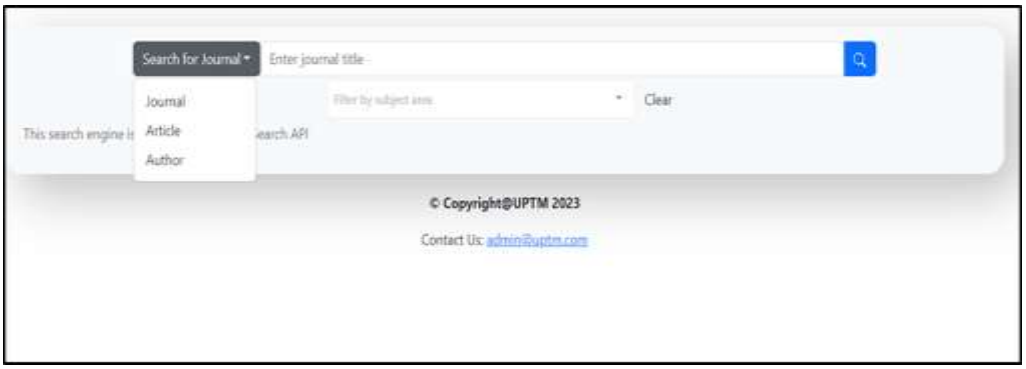
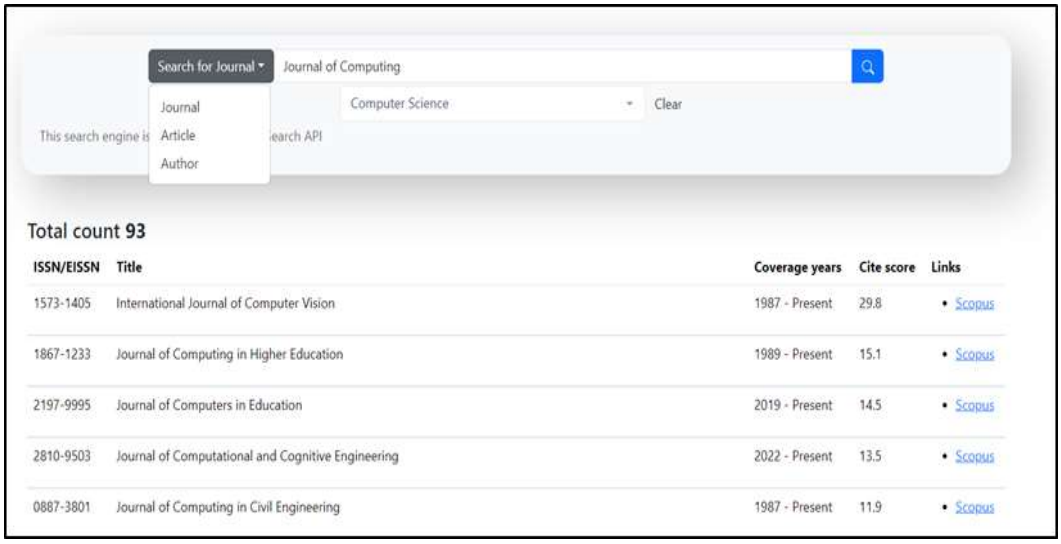


Fig. 4. Searching page



ISSN/EISSN	Title	Coverage years	Cite score	Links
1573-1405	International Journal of Computer Vision	1987 - Present	29.8	• Scopus
1867-1233	Journal of Computing in Higher Education	1989 - Present	15.1	• Scopus
2197-9995	Journal of Computers in Education	2019 - Present	14.5	• Scopus
2810-9503	Journal of Computational and Cognitive Engineering	2022 - Present	13.5	• Scopus
0887-3801	Journal of Computing in Civil Engineering	1987 - Present	11.9	• Scopus

Fig. 5. Searching for journal of computing-example

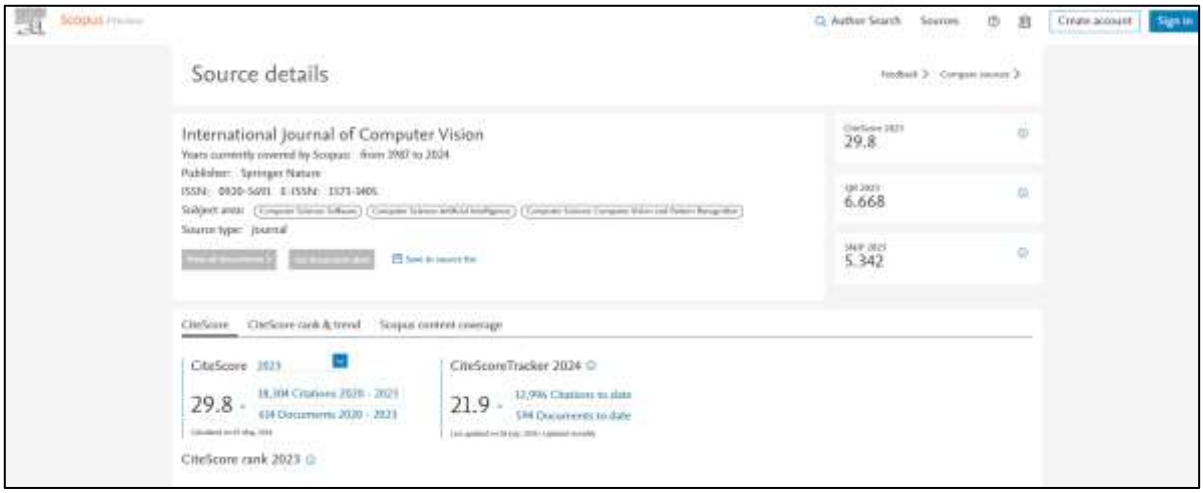


Fig. 6. Journal source details-example

Figure 7 shows the occurrence of the Journal in these two databases which are Web of Science (WOS) and Scopus. It means that the journal has been indexed accordingly. Besides that, figure 8 depicts the result for author search.

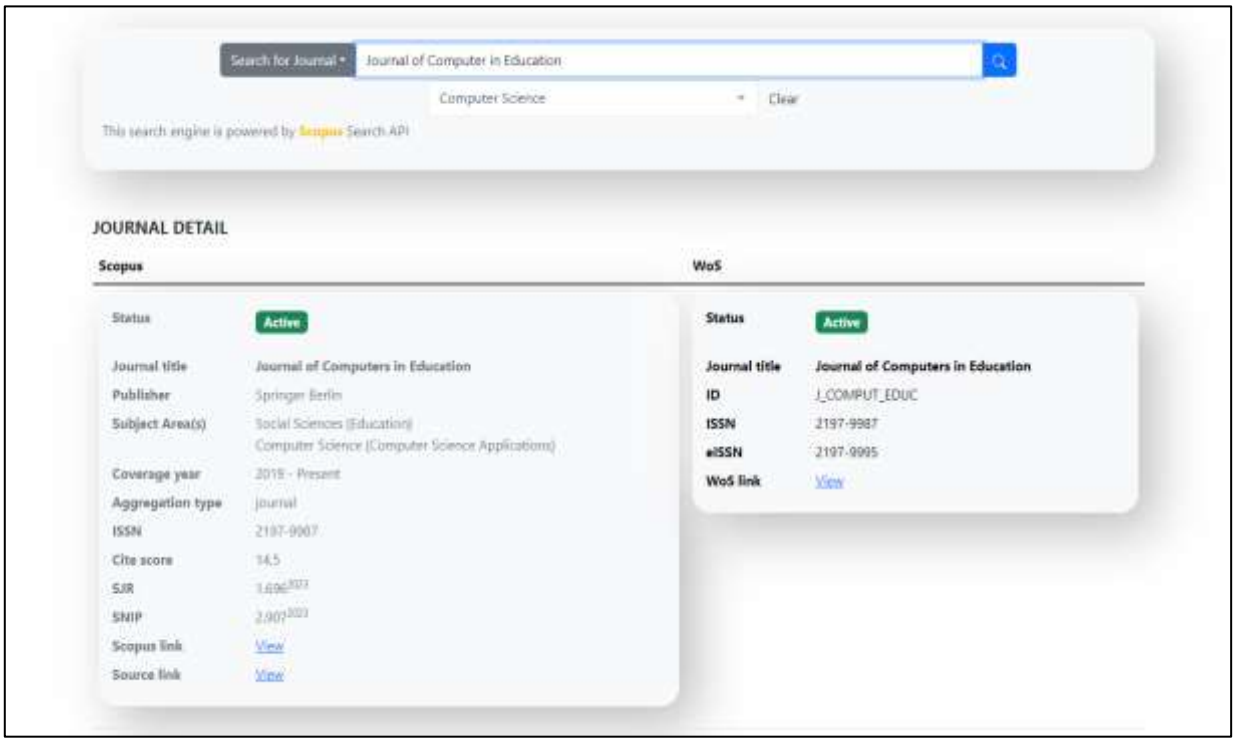


Fig. 7. Availability of journal in Scopus and WOS database

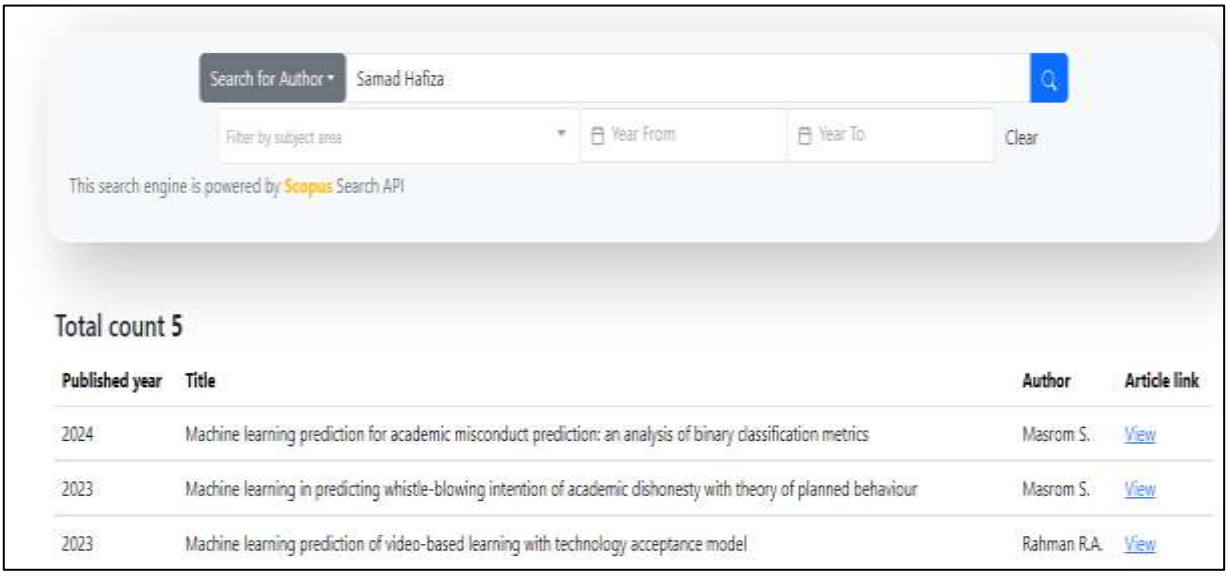


Fig. 8. Author search - example

5. Conclusions

The procedure of choosing journals for researchers has advanced significantly as a result of the creation and deployment of the Journal Finder System. By combining information from the Web of Science (WOS) and Scopus databases, the system offers a simplified, intuitive user interface that drastically cuts down on the time and effort needed to locate pertinent papers. According to user

input and comparative study, the system performs better than current tools in terms of accuracy, reaction speed, and user happiness. The Journal Finder System fills a vital void in the academic world by providing accurate and efficient journal selection. It is a vital breakthrough for the academic world, providing a more efficient method of journal selection that raises the caliber and productivity of research. The technology assists researchers in publishing their work in the most suitable venues, potentially boosting the visibility and impact of their study, by offering fast and accurate access to high-value journals.

The method enhances research efficiency and elevates the caliber of scholarly outputs by streamlining the search process and providing easier access to high-impact journals. The tool's favorable user feedback highlights its potential to become a vital resource for academics in a variety of fields. It is hoped that Universiti Poly Tech Malaysia UPTM instructors, students, and librarians will be able to use the system. Even if the method has many advantages, there are some drawbacks that must be understood and taken into account. The limitation of the journal finder is that because the system depends on the accuracy and availability of data from WOS and Scopus, any inconsistencies or restrictions in these databases may have an impact on the outcomes. Furthermore, other scholarly outputs like conference papers and book chapters are not yet included in the current approach, which mainly concentrates on journal selection. For the future research is that to integrate more databases other than Scopus and WOS such as My Cite to further extend the functionality and the variety of the published sources.

To conclude, it should be noted that the Journal Finder System is a major improvement for researchers at universities especially in the context of Universiti Poly Tech Malaysia UPTM. Through the provision of a comprehensive, effective, and intuitive journal selection tool, the system raises the impact and productivity of research. The system's continued improvement and expansion will solidify its position as a vital tool for the academic community, facilitating researchers' more efficient and successful navigation of the challenging world of scholarly publishing.

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