Improving Indexing Visibility for University of Zambia Hosted Journals: Practical Approaches and Workflow Enhancements through Open Journal System Integration

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Abstract— Enhancing the indexing readiness of scholarly journals is essential for increasing global visibility, accessibility, and academic credibility. This study improves the discoverability of Diamond Open Access journals at the University of Zambia through targeted technical and editorial interventions. Using a data mining approach, metadata was extracted from Google Scholar, Crossref, and the University of Zambia journal platform (via OAI-PMH) to compare indexing coverage. The work implements ORCID integration, metadata quality enhancements, and lightweight Open Journal Systems (OJS) plugins for automated metadata verification, DOI deposition, and DSpace package export. Initial tests show these tools help identify and correct indexing barriers, especially incomplete metadata and formatting inconsistencies. Findings indicate that technical upgrades and standardized editorial workflows can significantly improve readiness for inclusion in indexing services such as the Directory of Open Access Journals (DOAJ) and African Journals Online (AJOL). This approach offers a scalable model for strengthening institutional journal support and sustaining visibility in resource-limited environments.

Keywords—Diamond Open Access, Indexing, Metadata, Open Journal Systems, Scholarly Publishing

I. INTRODUCTION

Visibility in scholarly publishing is critical for research uptake and impact. Open Access (OA) journals, in particular, depend on accurate metadata and strong indexing to reach readers and potential collaborators. Poorly indexed journals remain invisible in search engines and scholarly databases, limiting readership and citations.

The University of Zambia (UNZA) manages 15 Diamond OA journals on the Open Journal Systems (OJS) platform. While the transition to online publishing in 2019 increased accessibility, indexing challenges persist. This research focuses on improving the discoverability of UNZA's journals through metadata quality enhancements, better integration with indexing services, and improved OJS platform functionality.

This paper contributes the following: (1) Empirical analysis of the current online visibility of UNZA-hosted OA journals. (2) Identification of metadata and indexing challenges affecting discoverability. (3) Proposed workflow and technical improvements within OJS to strengthen visibility.

The remainder of this paper is organised as follows: Section II provides background. Section III outlines the objectives. Section IV reviews related works. Section V describes the methodology. Section VI presents preliminary findings. Section VII discusses expected outcomes, and Section VIII concludes with recommendations for future work.BACKGROUND

Quality metadata includes accurate titles, abstracts, author affiliations, DOIs, and ORCID

identifiers. Best practices recommend consistent formatting, DOI assignment for all articles, and integration with indexing databases such as DOAJ, AJOL, Google Scholar, Crossref, Internet Archive and OpenAlex. Although UNZA's journals have benefited from the transition to online publishing, challenges do include:

- Inconsistent metadata formats.

- Missing or delayed DOI assignments.

- Limited coverage in major indexing databases.

- Open Journal System search and browsing limitations.

These gaps reduce the global reach of UNZA's scholarly work. Despite OJS being widely used, it does not guarantee full integration with indexing services unless configured. Research has also shown that even when metadata is exported from OJS, discrepancies often occur between the journal's internal records and the data displayed in indexing databases.

I. OBJECTIVES

The main objective is to improve the discoverability of UNZA's journal articles by enhancing indexing, metadata quality, and optimized OJS platform workflows. Specific objectives include assessing the indexing status and metadata quality of UNZA's journals on Scholarly platforms, conducting an empirical analysis using JABS as a pilot to identify gaps and inconsistencies in indexing and metadata practices, recommending improvements for metadata standardisation, ORCID integration, and editorial workflows to support indexing in major databases and enhancing the OJS platform to facilitate effective search and browsing of UNZA journal content.

II. RELATED WORKS

A. Indexing Status of Journals

Several studies have examined the visibility and indexing of scholarly journals, particularly in the context of open access. Inclusion in major indexes such as Google Scholar and Crossref has been shown to directly influence submission rates and citation impact. However, audits of Zambian journals reveal a persistent visibility gap, with many titles having limited online presence despite their longevity [1], [2]. This underlines the need for systematic assessment of indexing coverage, which is a central focus of the present study

B. Metadata Quality and Standards

Beyond indexing status, metadata quality is recurring theme in the literature. Smith et al highlighted the role of accurate and complete metadata in improving discoverability in indexing databases, arguing that poor metadata practices directly reduce citation rates and scholarly reach [9]. Chen and Gupta further showed that inconsistent title formats and missing author identifiers cause significant disparities in coverage across platforms such as Google Scholar., Crossref, and OpenAlex. Regional audits, including Zambian repositories, confirm frequent omissions against international standards [3], [4], [8]. These findings reinforce the importance of metadata analysis as the foundation for improving journal visibility.

C. Frameworks for Metadata Remediation

Building on the identified metadata challenges, several studies propose structured approaches to correction. Models such as EPIC (Evaluate, Prioritize, Identify, Correct) offer iterative pathways for addressing deficiencies [5]. Certification pilots, including those applied to the Journal of Agricultural and Biomedical Sciences (JABS), emphasize practices like mandatory ORCID integration and embedding quality checks into editorial workflows [5]. These frameworks provide methodological guidance for the present study's use of JABS as a pilot case.

D. Optimization of OJS for Visibility

While metadata and indexing form the foundation, the publishing platform itself also plays a role in discoverability. The literature highlights that effective use of Open Journal Systems (OJS) requires technical training and dedicated editorial management [6]. Studies further note that leveraging OJS's open-source architecture through plugins, configurations, and custom workflows can significantly improve search, browsing, and overall user experience [7], [8]. These insights align with this study's objective of enhancing OJS functionality to strengthen the visibility of UNZA's journals.

III. METHODOLOGY

This study adopts a quantitative data mining and empirical analysis approach guided by the CRISP-DM framework. The methodology is structured into six phases:

A. Business Understanding

The business understanding phase focused on improving the indexing visibility of UNZA-hosted

journals. The goal was to identify gaps in discoverability across scholarly platforms and define actionable steps for enhancing metadata quality and platform functionality.

B. Data Understanding

The data understanding phase involved collecting metadata from four key sources: Google Scholar, Crossref, OpenAlex, and the UNZA Open Journal Systems (OJS) platform.

The data collection process used a range of python-based tools. The *scholarly* library was applied to query Google Scholar by journal name and acronym, retrieving titles, authors, year of publication, links, and abstracts. Crossref metadata was obtained via the REST API using the UNZA DOI prefix (10.53974). OpenAlex records were harvested using API queries filtered by ISSN. Metadata from the UNZA OJS platform was accessed through the OAI-PMH protocol using the *Sickle* library.

C. Data Preparation

During data preparation, the collected metadata was cleaned, normalisied and structured for analysis. Matching was carried out across platforms was performed as follows: Google Scholar: Records were matched by comparing both article titles and abstract/description. Crossref, OpenAlex, and UNZA platform: A unique key was created for each dataset, and records were matched using article numbers.

Duplicate records were removed, and all metadata fields were standardized to ensure consistency for subsequent analysis.

D. Modeling

The modeling phase involved: Indexing Status Classification: Each article was classified based on its presence in Google Scholar, Crossref, and OpenAlex. Metadata Completeness Assessment: Each record was evaluated for completeness of key fields, including DOI, title, author list, abstract, keywords, and ORCID identifiers. Platform Optimization Assessment: OJS configuration and plugin usage were reviewed to identify areas where search, and browsing functionality could be enhanced to improve discoverability.

E. Evaluation

In the evaluation phase, the following analyses were conducted firstly indexing rate comparison the indexing coverage was calculated as the percentage of articles appearing in Google Scholar, Crossref, and OpenAlex relative to the total published in UNZA platform. This quantifies visibility gaps across platforms. Secondly, metadata completeness was assessed by checking each record for missing or inconsistent fields including title, authors, DOI, and ORCID identifiers. This identifies metadata deficiencies that affect discoverability. Lastly, the UNZA platform functionality review to find areas for optimization were

identified to improve discoverability, user experience, and indexing support.

F. Deployment

The deployment phase, still in progress, will use these findings to: (1) Guide workflow changes and editorial guidelines. (2) Improve metadata practices for indexing. (3) Enhance the UNZA OJS platform through configuration adjustments, plugin integration, and user interface improvements to support effective search, browsing, and overall visibility of UNZA journals.

IV. PRELIMINARY FINDINGS: JABS PILOT ANALYSIS

The pilot analysis focused on the *Journal of Agricultural and Biomedical Sciences* (JABS), chosen as a representative case for UNZA's broader publishing environment. Indexing coverage varied substantially between databases, as shown in Figure 1 and Table 1.
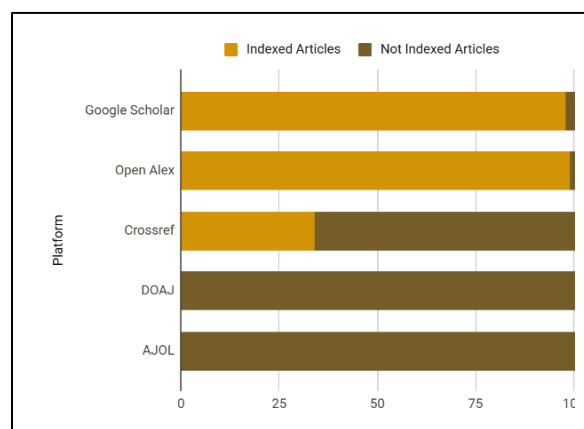

Fig. 1. Bar Chart for JABS Indexing Analysis

TABLE I. JABS INDEXING ANALYSIS

Platforms	Analysis	
	Indexed	*Not Indexed Articles*
Google Scholar	92	9
OpenAlex	99	2

Crossref	34	67
DOAJ	0	101
AJOL	0	101

Fig. 2. Example of metadata inconsistency from Indexed Platform and OJS Platform A

Fig. 3. Example of metadata inconsistency from Indexed Platform and OJS Platform

The analysis revealed that none of the indexed JABS articles contained ORCID identifiers, and article DOIs were not consistently registered post-publication, delaying indexing. This delay can significantly hinder the timely appearance of articles in indexing platforms. Metadata inconsistencies were also common, with discrepancies between UNZA OJS platform metadata and that stored in indexing services, as shown in Fig.2,3 Such inconsistencies particularly affected author name fields and abstracts, which may contribute to reduced discoverability in search results.

These findings highlight that improving metadata accuracy, standardising formats, and registering DOIs promptly are likely to yield measurable improvements in indexing rates and overall visibility.

V. EXPECTED OUTCOMES

The project is expected to deliver: (1) Improved Indexing Coverage: Higher proportions of UNZA journal articles indexed in Google Scholar, Crossref, OpenAlex, and other scholarly platforms. (2) Enhanced Metadata Quality: Standardized metadata fields, consistent author names, abstracts, and ORCID identifiers. (3) Optimized OJS Platform: Better search, browsing, and user experience for journals hosted on UNZA's OJS instance. (4) Workflow and Editorial Guidelines: Recommendations for timely DOI registration, metadata updates, and integration with indexing services. (5) Pilot Methodology Validation: The JABS pilot provides a replicable framework for evaluating and improving other UNZA journals.

VI. CONCLUSION

This paper highlights the low online visibility of UNZA journals and the challenges affecting indexing, including metadata inconsistencies, missing ORCIDs, and delayed DOI registration. The JABS pilot demonstrates that improvements in metadata standardization, DOI registration, and platform optimization can yield measurable gains in discoverability.

Future work will focus on expanding the analysis to all UNZA journals. Evaluating machine learning and crowdsourcing approaches for automatic metadata validation, classification, and re-indexing.

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