International Research Journal of Multidisciplinary Scope (IRJMS), 2026; 7(2): 1568-1581 IRJMS

Original Article | ISSN (O): 2582-631X DOI: 10.47857/irjms.2026.v07i02.09121

A Webometric Study of Prominent Global Repositories

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Abstract

This study examined ten prominent global repositories through comprehensive webometric analysis. MOZ software, a link analysis tool, served as the primary analytical tool for measuring various performance metrics, including Domain Authority (DA) and Page Authority (PA) scores, along with comprehensive link analysis covering inbound and outbound connections, internal and external link equity distribution, linking domain counts and newly identified link discoveries. To determine the web presence of each repository, the Google search engine's site-specific operator was used to extract total webpage counts. Network visualization techniques mapped repository interconnections, while a nineteen-point evaluation framework was used to assess functionality and characteristics of the repositories. Webometric analysis measured web page counts, link structures and Web Impact Factors to evaluate online performance. Results show the Astrophysics Data System (ADS) and NASA Technical Reports Server (NTRS) achieved the highest Domain Authority scores and linking domain counts, demonstrating superior credibility and web presence. The eScholarship Repository (ESR) achieved exceptional performance, with a Simple Web Impact Factor of 179.28 and an Internal Link Web Impact Factor of 177.24, exhibiting a strong overall link equity distribution. Link analysis revealed significant differences in web visibility and stability across repositories. Content evaluation revealed widespread deficiencies in user support features, including the absence of grants and fellowships, awards, customer service details, frequently asked questions (FAQ) sections, blogs and update notifications. These results offer practical guidance for enhancing repository design and functionality, helping repository administrators, researchers and academic institutions improve their digital presence and user experience.

Keywords: Repositories, Web-analysis, Web content analysis, Web Impact Factor, Webometrics.

Introduction

Globally, digital repositories have emerged as essential platforms for enhancing research visibility, promoting open access and ensuring the long-term preservation of scholarly output. Repositories are defined as network-based systems designed to manage and disseminate collections of digital objects (1). These include institutional repositories, publisher-managed archives, data repositories, learning object repositories and cultural heritage collections. Institutional repositories (IRs) are online platforms dedicated to collecting, preserving and disseminating the intellectual output of research institutions (2). Such repositories often host preprints and postprints of scholarly articles, electronic theses and dissertations, course materials and other academic resources. In addition to enhancing institutional visibility, repositories play a vital role in managing digital scholarship and addressing barriers in scholarly communication (3, 4). These contributions underscore their growing relevance in global webometric rankings and their strong association with the Open Access movement.

The rise of repositories is closely linked to the development of webometrics as a framework for evaluating online performance (5). Webometrics is defined as the quantitative analysis of web-based phenomena, including website structures, hyperlink networks and user engagement (6). It has been conceptualized as the application of bibliometric and informetric approaches to study the structure and use of web resources (7, 8). Four primary dimensions are typically considered: (a) content analysis of web pages, (b) evaluation of internal, self and external linking structures, (c) analysis of usage and traffic behavior and (d) assessment of the technological infrastructure of websites. Methods such as hyperlink analysis, search engine evaluation, mention tracking and digital library link assessment are widely used, with link analysis among the most prevalent

(Received 11th November 2025; Accepted 15th April 2026; Published 25th April 2026)

approaches.

One notable application of webometric methods is repository ranking. The Ranking Web of World Repositories was introduced to promote Open Access by assessing repositories based on both visibility and global influence (9). Its methodology parallels citation-based evaluation. Further extensions of Repositories emphasize four key dimensions: content, link structure, user behavior and technological infrastructure (10). Additionally, Search Engine Optimization (SEO) tools such as MOZ and SmallSEOTools provide metrics on backlinks, linking domains, search rankings and visibility scores for evaluating repositories.

This study examines the digital content and web visibility of prominent repositories. Repositories listed in Table 1 are evaluated using webometric indicators to compare their online performance and academic standing.

At the global level, numerous studies have highlighted the importance of webometric analysis. Studies of Malaysian academic library websites have shown that well-structured and user-friendly websites enhance accessibility and user engagement, whereas poorly designed sites limit digital reach (11). A comparative analysis of European university websites focusing on link structures and Web Impact Factors (WIFs) revealed that institutions with stronger international collaboration and more accessible digital content achieved greater web presence (12). Studies examining academic repositories at the global level have demonstrated that multilingual content and extensive external linking networks play a significant role in enhancing scholarly visibility and citation impact (13). Other findings emphasize that design quality and navigability influence research discoverability (14).

In the South Asian context, evaluations of national library websites have shown that the National Library of India ranked highest in terms of web page count and link structure. In contrast, other libraries lagged in overall visibility (15). Analyses of public library websites revealed that the Central Secretariat Library achieved the highest simple and external WIF, with only one library displaying both internal and external linking structures. Similar webometric investigations of academic library websites have examined webpages, domain authority and internal and external link structures to assess institutional web visibility and ranking, highlighting the importance of structured linking patterns and search optimization tools in improving web impact performance (16, 17). These studies employed the MOZ analytics platform (formerly known as Open site Explorer) to derive domain authority and link-based indicators. Studies of university websites reported that certain technical institutions generated the highest number of outgoing links.

In contrast, major central universities received the most in-links, highlighting the importance of interconnectivity in enhancing web visibility (18). Additional investigations focusing on universities within Tamil Nadu examined domain structures, web pages and link pages, calculating multiple forms of WIF, including self-link, simple and external WIF, to establish ranking frameworks for academic institutions (19). Beyond academia, webometric analyses of Indian law university websites mapped in-links, out-links and link structures using multiple SEO and crawler-based tools to assess online visibility (20). Subsequent regional-level studies extended this approach to South Asian digital repositories, ranking them using search engine–derived indicators. These studies revealed substantial variation in visibility and link structures across repositories, underscoring the importance of maintaining a consistent, robust web presence to enhance accessibility and scholarly reach (21).

Collectively, these studies demonstrate the growing importance of webometric indicators in evaluating the visibility and effectiveness of academic and organizational websites. While previous research has primarily focused on universities, libraries and judicial websites in South Asia, limited work systematically compares the world's prominent repositories. This gap is particularly important, as repositories are central to global scholarly communication, facilitating the wide dissemination of research outputs across borders. To address this gap, the present study undertakes a webometric assessment of the prominent repositories worldwide, examining digital content, website structure, link dynamics and search engine visibility. The objective is to identify best practices that enhance accessibility, visibility and impact at a global scale. Previous studies indicate that users increasingly rely on digital repositories to fulfill their academic and

research needs (22–24). A thorough review of existing literature further reveals that comprehensive webometric studies focusing on link structures, technological features and overall performance of prominent global repositories remain limited (9, 25). This gap provides the rationale for the present study, leading to the following objectives.

a) To determine the Web Impact of Prominent Global Repositories.
b) To examine the Domain Authority and Page Authority of Prominent Global Repositories.
c) To analyze Link Equity among Prominent Global Repositories.
d) To evaluate the Web Content and Technological Features of Prominent Global Repositories.
e) To map and analyze the Network Structure of Prominent Global Repositories by examining their URLs and linkages with social platforms.

Methodology

Research Design

This study conducts a webometric analysis of ten prominent global repository websites. In addition, a web content evaluation was performed using a checklist comprising 19 distinct criteria, adapted from an established evaluative framework (26). The analysis was carried out using Moz software, which served as the primary tool for data collection and evaluation, providing extensive insights into the linking structure of the repository websites.

The repositories were selected using a purposive multi-criteria framework. In this study, *"prominent global repositories"* does not refer to the top-ten ranked repositories; rather, prominence is defined through inclusion within the Webometrics Ranking of Repositories developed by the Cybermetrics Lab under the Consejo Superior de Investigaciones Científicas (CSIC) (Spain), particularly those appearing within the Transparency and/or Visibility indicators. Selection further considered global visibility, geographic representation, disciplinary diversity and operational accessibility within the scholarly communication ecosystem.

Table 1 lists the ten prominent global repositories selected for this study, together with their acronyms, official websites and countries of origin. These repositories represent different geographical regions and provide a diverse sample for webometric analysis. Their inclusion facilitates a comparative evaluation of repository visibility and technological characteristics.

Table 1: Selected Prominent Global Repositories for Webometric Analysis

Repository Name	Acronym	Website	Country
Astrophysics Data System	ADS	https://ui.adsabs.harvard.edu/	USA
NASA Technical Reports Server	NTRS	https://ntrs.nasa.gov/	USA
LUME - Repositório Digital da Universidade Federal do Rio Grande do Sul	LUME	https://lume.ufrgs.br/	Brazil
Belarusian State University Digital Library	BSUDL	http://elib.bsu.by/	Belarus
Kyoto University Research Information Repository	KURENAI	https://repository.kulib.kyoto-u.ac.jp/dspace/	Japan
Charles University Digital Repository	CUDR	https://dspace.cuni.cz/	Czech Republic
Jagiellonian University Repository	JUR	https://ruj.uj.edu.pl/	Poland
eScholarship Repository	ESR	https://escholarship.org/	USA
Biblioteca Digital Brasileira de Teses e Dissertações	BDTD	http://bdtd.ibict.br/	Brazil
UPCommons – Universitat Politècnica de Catalunya	UPC	https://upcommons.upc.edu/	Spain

Webometric Indicators and Instruments

This study employs various webometric indicators, including DA, PA and multiple forms of the Web Impact Factor (WIF), to assess the performance of prominent global repositories. The webometric data were collected and cross-verified between 1–7 September 2025 to ensure temporal consistency across all selected repositories, as webometric indicators are highly dynamic and may fluctuate frequently due to search engine indexing updates and crawler variations.

Collecting data within a short and uniform time frame minimized temporal bias and enhanced the comparability of results. The discovered and lost link metrics, however, were analysed for the period from July to September 2025 using the Moz link analysis interface, as these indicators inherently represent cumulative link changes over a defined time range. DA and PA are standardized indicators created by Moz to assess a website's overall web influence and search engine visibility. DA refers to the overall strength of a domain or subdomain and is measured on a scale of 1 to 100, with higher values indicating greater ranking potential (27). PA, in contrast, evaluates the authority of an individual webpage in search engine results and is also scored on a scale of 1 to 100 (28).

MOZ was selected because its Domain Authority (DA) and Page Authority (PA) provide standardized, link-based metrics on a normalized 0–100 scale, enabling consistent comparative evaluation across repositories. These indicators align with webometric analysis focused on link visibility and Web Impact Factor (WIF), while the availability of reproducible metrics supports methodological consistency across the selected repositories. Additionally, MOZ Link Explorer provides publicly accessible metrics that support transparency and reproducibility, whereas alternative tools largely require subscription-based access (29).

The WIF is further divided into three variants: the Simple Web Impact Factor (SWIF), the Internal Web Impact Factor (IWIF) and the External Web Impact Factor (EWIF). SWIF is determined by calculating the ratio of the total number of links (both internal and external) to the total number of indexed web pages, as shown in Equation [1]. For this purpose, the number of web pages was obtained by using the Google search operator site: followed by the specific URL (Uniform Resource Locator) of each repository website. IWIF measures the ratio of internal links to the number of web pages, as presented in Equation [2], while EWIF represents the ratio of external links to the number of web pages, as given in Equation [3]. Data analysis for these metrics was conducted using Microsoft Excel 2021. The concept of WIF was originally introduced by Peter Ingwersen in 1998, who proposed different variations of the factor based on the relationship between the number of links received and the number of web pages hosted (30). A review of the literature indicates that no prior research has applied all the formulas to these International Repository websites. However, the formulas are widely recognized and have been adopted in several earlier studies, making them appropriate for this study. The three measures are summarized as follows:

$$\text{SWIF}=\frac{\text{Total number of links}}{\text{Total number of Webpages}} \quad [1]$$

$$\text{IWIF}=\frac{\text{Total number of Internal links}}{\text{Total number of Webpages}} \quad [2]$$

$$\text{EWIF}=\frac{\text{Total number of External links}}{\text{Total number of Webpages}} \quad [3]$$

$$\text{Percentage of DA} = \frac{\text{DA of a Repository}}{\sum \text{DA of all Repositories}} \times 100 \quad [4]$$

$$\text{Percentage of PA} = \frac{\text{PA of a Repository}}{\sum \text{PA of all Repositories}} \times 100 \quad [5]$$

Measurement of Domain Authority (DA) and Page Authority (PA) as a Percentage

To facilitate comparative interpretation within the dataset, DA and PA were expressed as relative percentage contributions using the following formulas, as shown in Equation [4] for DA and Equation [5] for PA.

These calculations represent each repository's authority as its relative share of the cumulative DA and PA values across all the repositories included in the study. By emphasizing proportional contribution rather than raw scores, this approach facilitates meaningful comparisons among repositories with varying sizes and web presence. Consequently, the analysis highlights relative web visibility and influence, ensuring a more balanced interpretation of webometric performance.

Results

Domain Authority (DA) and Page Authority (PA) of the Prominent Global Repositories

Figure 1 presents the Domain Authority (DA) and Page Authority (PA) scores of the selected repositories, providing a comparative overview of their web impact and visibility. The analysis reveals that the ADS and the NTRS repositories are the strongest performers, each recording a DA of 93 and high PA scores of 73 and 70, respectively, along with the highest proportional measures (Percentage of DA: 12.2 and Percentage of PA: 12.8 for ADS; Percentage of DA: 12.2 and Percentage of PA: 12.3 for NTRS), which highlights their dominant web presence. The Kyoto University Research Information Repository (KURENAI), the Repositorio Digital Universidade Federal do Rio Grande do Sul (LUME) and the ESR fall into the mid-performance category, with DA values ranging from 77 to 83 and PA values between 52 and 61, reflecting stable but moderate influence. In contrast, the Belarusian State University Digital Library (BSUDL) and the Jagiellonian University Repository (JUR) show the weakest performance, with DA scores of 56 and 67, PA scores of 51 and 49 and relatively low proportional values (below 9%), indicating limited visibility. Meanwhile, the CUDR, the Brazilian Digital Library of Theses and Dissertations (BDTD) and UPCommons – Universitat Politècnica de Catalunya (UPC) occupy the middle ground, displaying fair but not outstanding results. Overall, ADS and NTRS emerge as the most authoritative repositories, BSUDL and JUR rank the lowest and the others demonstrate moderate levels of web impact. These disparities reflect differences in institutional support and indexing coverage, suggesting that lower-ranking repositories need stronger digital strategies to improve their web presence.

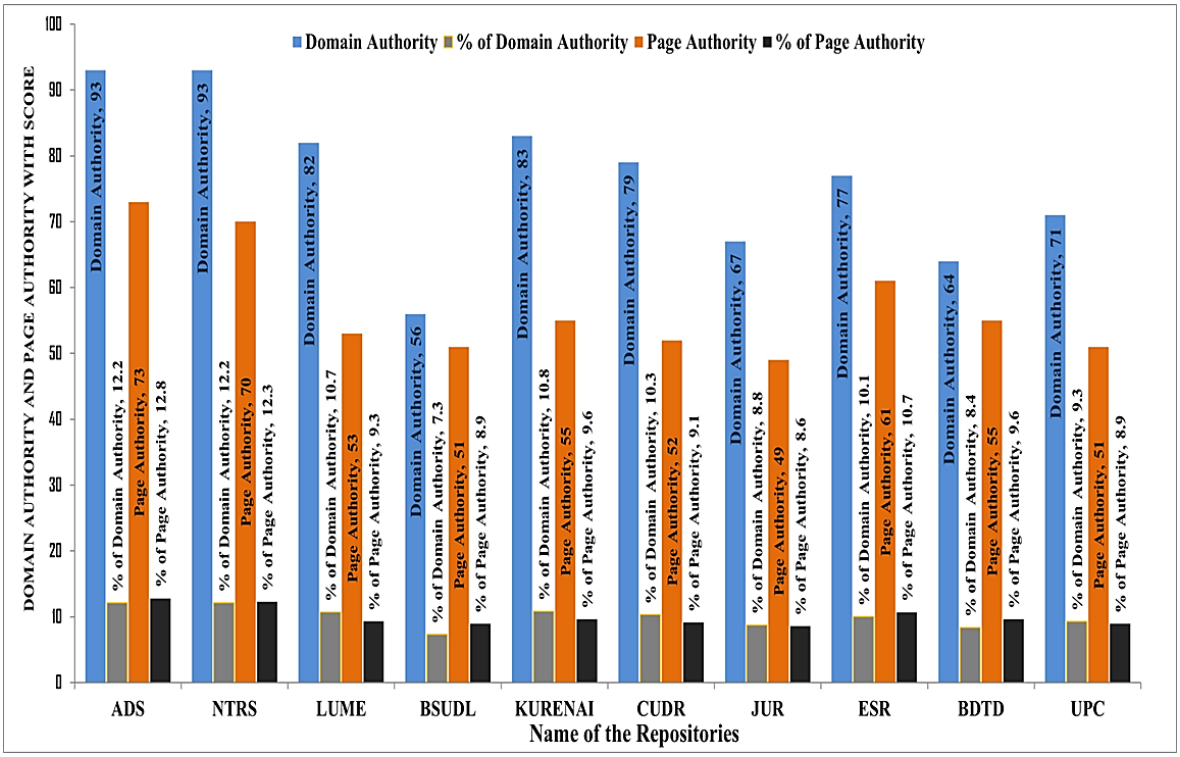

Figure 1: DA and PA Scores of the Prominent Global repositories

Analysis of Link Structures of Prominent repositories in the world

Table 2 highlights the link structure analysis of prominent repositories worldwide, encompassing webpages, internal links, external links and total links to assess their structural web presence. The results show that the ADS leads with the highest number of webpages (10.5 million) and total links (67.2 million), making it the most dominant repository in terms of scale. ESR repository ranks second overall, recording the highest number of internal links (319 million), which strengthens its structural visibility. The BSUDL also ranks among the top three with 61.2 million total links, though

most are internal. In terms of external connectivity, NTRS (7.9 million), BDTD (8.0 million) and ESR (3.6 million) emerge as the top three, reflecting stronger global linkages. By contrast, repositories such as JUR and Charles University Digital Repository (CUDR) show modest external link counts, limiting their wider visibility. Overall, ADS, ESR and BSUDL dominate the link structure, while NTRS and Biblioteca Digital Brasileira de Teses e Dissertações (BDTD) strengthen their positions through external connections.

Table 2: Distribution of Web Pages and Link Structures (Internal Links, External Links and Total Links)

Acronym	Total Webpages	Internal Links	External Links	Total Links
ADS	10,500,000	28,793,272	38,501,776	67,295,048
NTRS	793,000	861,798	7,902,541	8,764,339
LUME	1,810,000	10,615,038	853,508	11,468,546
BSUDL	2,030,000	60,917,826	370,664	61,288,490
KURENAI	5,420,000	1,465,363	210,984	1,676,347
CUDR	341,000	2,149,165	95,438	2,244,603
JUR	346,000	3,987,405	45,070	4,032,475
ESR	1,800,000	319,034,105	3,670,672	322,704,777
BDTD	1,830,000	49,945,232	8,070,673	58,015,905
UPC	915,000	26,503,985	401,567	26,905,552

Top Individualized Root Domains of the Prominent Repositories of the World

Table 3 illustrates the top individualized root domains of prominent repositories worldwide, highlighting their Domain Authority (DA) and the number of linking domains to assess their credibility and global web presence. The findings reveal that among the prominent global repositories, the NTRS and the ESR emerge as the most influential, with the highest DA [100] and the largest number of linking domains (over 27 million), indicating strong credibility and extensive web visibility. Other repositories such as the ADS, LUME, BSUDL, KURENAI, CUDR and the UPC exhibit high DA values [97–99)]and moderate numbers of linking domains, reflecting robust authority but relatively lower global outreach. Other repositories, such as the JUR and the BDTD, also demonstrate strong DA [97–96] but have fewer linking domains, suggesting limited international visibility despite their academic relevance. Common root domains linking to these repositories, including en.wikipedia.org, youtube.com, googleusercontent.com, microsoft.com and github.com, contribute significantly to their authority and online presence. Overall, DA highlights credibility, while the number of linking domains indicates broader web impact, with the NTRS and the ESR clearly leading in both measures.

Table 3: Key Linking Web Domains of Top Global Repositories

Acronym	Root Domain 1	Root Domain 2	DA 1	DA 2	Linking Domain 1	Linking Domain 2
ADS	wordpress.org	googleusercontent.com	99	99	13,588,755	15,911,472
NTRS	youtube.com	cloudflare.com	100	99	27,290,159	11,227,818
LUME	en.wikipedia.org	es.wikipedia.org	97	96	7,390,693	3,830,560
BSUDL	en.wikipedia.org	github.com	97	96	7,390,693	3,830,560
KURENAI	microsoft.com	en.wikipedia.org	98	97	5,983,982	7,390,693
CUDR	en.wikipedia.org	github.com	97	96	7,390,693	3,830,560
JUR	en.wikipedia.org	es.wikipedia.org	97	96	7,390,693	1,006,220
ESR	youtube.com	googleusercontent.com	100	99	27,288,481	15,909,964
BDTD	en.wikipedia.org	pt.wikipedia.org	97	96	7,390,599	430,683
UPC	docs.google.com	microsoft.com	98	98	4,156,692	5,983,978

Internal Equity-Passing Links, External Equity-Passing Links and Total Equity-Passing Links

Table 4 presents the distribution of internal, external and total equity-passing links among prominent global repository websites, offering a comparative assessment of their link equity and overall web authority. The analysis unveils the

dominance of ESR in internal equity-passing links with 64.14% and the total equity-passing links with 60.24%, reflecting its extensive web presence and strong global visibility. BSUDL leads with 11.47% of total equity, followed by BDTD with 9.62% and ADS with 8.59%, demonstrating substantial authority and influence within the web ecosystem. UPC contributes 4.95%, while LUME accounts for 2.14%, indicating moderate but stable link equity. Repositories such as NTRS (1.51%), CUDR (0.42%), KURENAI (0.31%) and JUR (0.75%) exhibit comparatively lower shares of total equity-passing links, suggesting more limited web reach. Overall, the findings highlight a highly uneven distribution of link equity, with a small number of repositories accounting for the majority of total equity-passing links, underscoring their dominant role in global scholarly web visibility.

Table 4: Comparison of Internal Links, External Links and Total Link Equity

Acronym	Internal Equity-Passing Links	External Equity-Passing Links	Total Equity-Passing Links
ADS	28,793,262	17,075,588	45,868,850
	(5.79%)	(46.62%)	(8.59%)
NTRS	861,370	7,185,426	8,046,796
	(0.17%)	(19.62%)	(1.51%)
LUME	10,615,038	802,678	11,417,716
	(2.13%)	(2.19%)	(2.14%)
BSUDL	60,917,800	355,668	61,273,468
	(12.25%)	(0.97%)	(11.47%)
KURENAI	1,465,281	171,270	1,636,551
	(0.29%)	(0.47%)	(0.31%)
CUDR	2,149,164	71,056	2,220,220
	(0.43%)	(0.19%)	(0.42%)
JUR	3,987,405	19,215	4,006,620
	(0.80%)	(0.05%)	(0.75%)
ESR	319,034,103	2,687,784	321,721,887
	(64.14%)	(7.34%)	(60.24%)
BDTD	43,322,052	8,055,034	51,377,086
	(8.71%)	(21.99%)	(9.62%)
UPC	26,225,812	205,921	26,431,733
	(5.27%)	(0.56%)	(4.95%)
	497,371,287	**36,629,640**	**534,000,927**

Web Visibility Analysis of the Prominent Global Repositories

Table 5 provides the web visibility analysis of prominent global repositories, examining their total linking root domains and followed linking domains to evaluate their academic reach and online influence. The findings demonstrate a set of internationally recognized academic repositories along with their link-based visibility indicators, including total linking root domains and followed linking domains. Among them, ESR shows the highest web visibility, with 53,814 total linking domains and 44,404 followed linking domains, reflecting its strong global academic reach. NTRS and ADS exhibit high link popularity, with 38,607 and 29,747 total linking domains, respectively, signaling their extensive use in scholarly research. UPC [9,785], KURENAI [5,987] and LUME [3,426] demonstrate moderate web presence with substantial academic engagement. Meanwhile, BDTD [2,756], BSUDL [2,281], CUDR [3,790] and JUR [2,246] show comparatively lower, yet notable, linking metrics, indicating their role as important institutional sources of theses, dissertations and academic publications. Overall, the data highlight the varying degrees of visibility and impact of these repositories across the global academic web ecosystem.

Table 5: Web Visibility Analysis of Prominent International Repositories

Acronym	Total linking Root domains	Followed linking Domain
ADS	29,747	23,798
NTRS	38,607	30,593
LUME	3,426	2,612

BSUDL	2,281	1,529
KURENAI	5,987	4,657
CUDR	3,790	2,989
JUR	2,246	1,409
ESR	53,814	44,404
BDTD	2,756	2,375
UPC	9,785	7,898

Comparative Analysis of SWIF, IWIF and EWIF Across the Repositories

Table 6 presents a comparative analysis of the SWIF, IWIF and EWIF across the selected repositories, offering insights into their internal connectivity and external web recognition The findings indicate notable variations across the three webometric indicators. ESR exhibits an exceptionally high SWIF [179.28] and IWIF [177.24], underscoring its dense internal connectivity and strong link structure. NTRS demonstrates the highest EWIF [9.96], indicating comparatively greater external visibility and recognition within the broader web environment. Repositories such as BSUDL, BDTD and UPC register relatively strong SWIF and IWIF values, yet their external impact remains marginal. Conversely, KURENAI reflects the weakest performance across all measures, highlighting a minimal digital footprint. Overall, it can be inferred that while robust internal structures characterize most repositories, they lack proportional external visibility, with NTRS emerging as the notable exception.

Table 6: Comparative Webometric Indicators of Prominent Repositories

Acronym	SWIF	IWIF	EWIF
ADS	6.409	2.742	3.667
NTRS	11.052	1.087	9.965
LUME	6.336	5.865	0.472
BSUDL	30.191	30.009	0.183
KURENAI	0.309	0.27	0.039
CUDR	6.582	6.303	0.28
JUR	11.655	11.524	0.13
ESR	179.28	177.241	2.039
BDTD	31.703	27.292	4.41
UPC	29.405	28.966	0.439

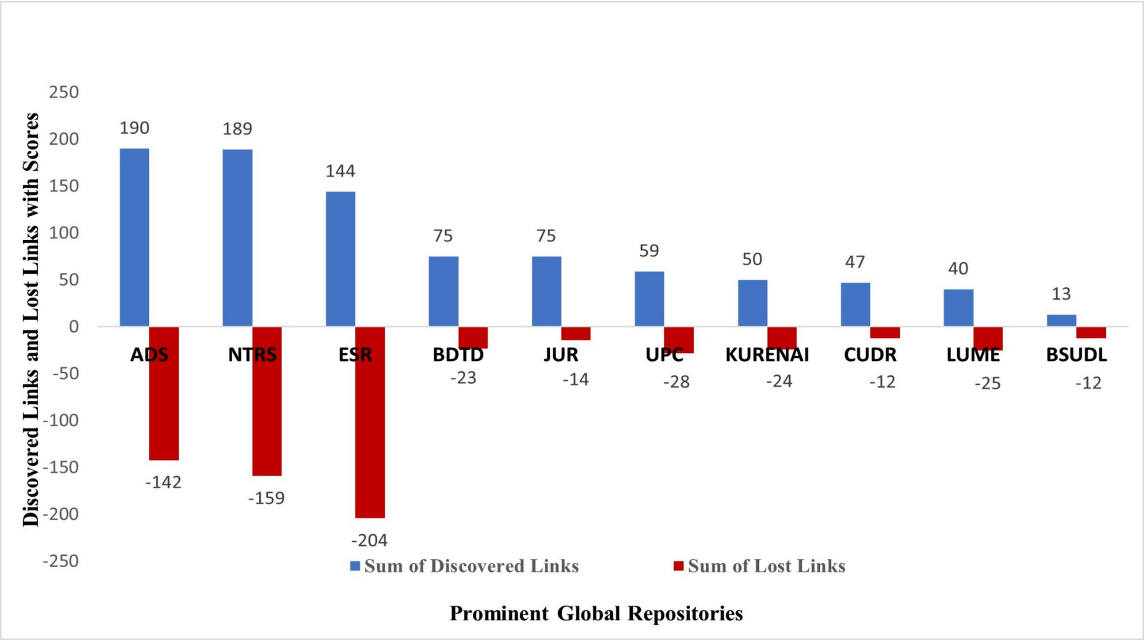

Figure 2: Dynamics of Discovered and Lost Links

Discovered and Lost Links

Figure 2 summarizes the analytical results of discovered and lost links across the selected repositories, providing a comparative overview of their web visibility and link dynamics. The results show significant variations in their web visibility and stability. Among the repositories, ADS, NTRS and ESR recorded the highest numbers of newly discovered links (190, 189 and 144, respectively), reflecting their strong online presence and influence. However, these repositories also experienced substantial link losses: ESR lost 204 links, NTRS 159 and ADS 142. This indicates that although their visibility is high, it remains unstable due to rapid link turnover.

In contrast, mid-tier repositories such as BDTD and JUR demonstrated more balanced growth, each gaining 75 new links while losing only 23 and 14, respectively, suggesting steadier engagement with relatively lower attrition. Similarly, UPC, KURENAI, CUDR and LUME showed moderate increases in discovered links accompanied by manageable losses, highlighting their consistent yet gradual expansion. At the lower end, BSUDL recorded the least link activity (13 gained and 12 lost), suggesting limited visibility and weaker web impact.

Network Visualization of the Prominent Global Repositories

Figure 3 outlines the integration analysis of selected repositories with major global scholarly platforms, illustrating the extent of their connectivity and academic dissemination across the web. The analysis highlights the strong integration of repositories with major global scholarly platforms, namely Google Scholar, Mendeley, ResearchGate, Academia.edu, IEEE Xplore and ScienceDirect. Google Scholar, Research Gate. Mendeley demonstrates wide-spread connectivity, linking with almost all repositories in the network, including UPC, KURENAI, ESR, BDTD, LUME, CUDR, ADS, BSUDL, JUR and NTRS. This extensive linkage underscores their role as universal indexing and citation platforms that enhance the global visibility of repositories. ResearchGate, in contrast, not only maintains broad connectivity but also reveals the strongest linkages, particularly with JUR, BSUDL, LUME and NTRS, indicating its pivotal function as a collaborative academic hub where repository content finds extensive engagement.

Academia.edu, IEEE Xplore and ScienceDirect also connect widely across repositories such as ADS, JUR, ESR, CUDR, LUME, UPC, NTRS, KURENAI, BDTD and BSUDL, reflecting their importance as secondary but influential dissemination channels. The consistency of these connections suggests that repositories rely heavily on such academic platforms for extending their reach beyond institutional or regional boundaries (31).

Web content and features of the Prominent Global Repositories in the world

Table 7 shows the web content and feature analysis of ten prominent global repositories, evaluating their functional offerings and usability attributes to assess the comprehensiveness of their digital infrastructure. The evaluation reveals differences in feature availability across the selected repositories. Repositories such as UPC, KURENAI and ESR offer a wide range of features that enhance usability and transparency. In contrast, repositories such as JUR, ADS and the NASA STI Repository provide fewer features, focusing primarily on core functionalities. None of the repositories achieved the maximum possible score. All repository websites include information on Contact Us, Search Options, Authority, About Repository, Navigation and Links, Web 2.0 and Publications. None of the repositories provides an Awards feature. Most repositories offer Statistics, Preservation Policy and Customer Service, while fewer provide Copyright, FAQ, blog, or Submission Guidelines.

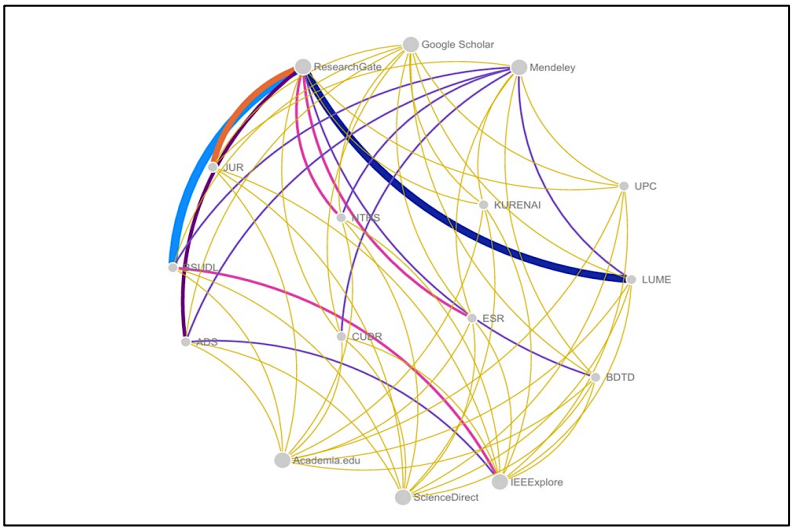

Figure 3: Network Visualization of the Prominent Repositories in the World

Table 7: Web Content Analysis

	Name of the Repositories										
Criterion	**ADS**	**NTRS**	**LUME**	**BSUDL**	**KURENAI**	**CUDR**	**JUR**	**ESR**	**BDTD**	**UPC**	**Total Score out of 10**
Contact Us	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	10(100%)
Search Options	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	10(100%)
Authority	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	10(100%)
About Repository	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	10(100%)
Navigation and Links	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	10(100%)
Customer Service	N	Y	Y	N	Y	N	N	Y	Y	Y	6 (60%)
Copyright	N	N	N	N	Y	N	N	Y	Y	Y	3 (30%)
Submission Guidelines	N	N	N	N	N	N	N	N	Y	Y	2 (20%)
Sitemap	N	N	Y	N	Y	Y	N	Y	N	Y	5 (50%)
FAQ	N	N	N	N	Y	N	N	Y	N	Y	3 (30%)
Web 2.0	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	10 (100%)
Statistics	N	Y	Y	Y	N	Y	N	Y	Y	Y	7(70%)
Blog	Y	N	N	N	N	N	N	N	N	N	1 (10%)
Grants and Fellowship	N	N	N	N	N	N	N	N	N	N	0
Awards	N	N	N	N	N	N	N	N	N	N	0
Publications	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	10 (100%)
Metadata policy	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	9(90%)
Preservation Policy	N	N	Y	N	Y	Y	N	Y	Y	Y	6(60%)
Last update	N	Y	N	N	N	N	N	N	N	N	1 (10%)
Score (out of 19)	9	10	12	9	13	11	8	14	13	15	

Note: Y indicates the presence of the feature on the website. N indicates the absence of the feature on the website.

Discussion

The present study provides a comprehensive evaluation of the web presence and linking behaviour of selected global repository platforms, revealing substantial variation in their structural characteristics and visibility strategies. Differences in domain configurations reflect institutional policies and technical frameworks, which in turn influence how repositories are indexed, linked and accessed within the broader web environment. The predominance of internal linking observed across several repositories indicates a strong focus on internal content organization and navigational efficiency. However, repositories exhibiting relatively higher levels of external connectivity appear to benefit from enhanced scholarly exposure, reinforcing the importance of outward link networks in strengthening web visibility (32). The limited number of repositories achieving simultaneously high Domain Authority and Page Authority scores suggests that maintaining balanced authority across both domain-level and page-level metrics remains a challenge. This imbalance indicates that strong institutional presence does not automatically translate into uniformly influential individual web pages. The recurring prominence of widely used knowledge and multimedia platforms among frequently linked external domains further illustrates the evolving landscape of scholarly communication, where repositories increasingly intersect with non-traditional platforms to extend their reach and engagement (20).

Considerable variability in Web Impact Factor values across repositories highlights the absence of standardized growth patterns in institutional web ecosystems. Such variation can be attributed to differences in content volume, linking practices and maintenance strategies. Persistent shortcomings related to the lack of visible update information continue to undermine transparency and may affect user trust and long-term credibility. Similar concerns have been documented in previous webometric studies, emphasizing the need for consistent content maintenance and disclosure practices within repository environments (33-35). Differences in the distribution of internal and external equity-passing links suggest that repositories adopt distinct strategic orientations. While repositories emphasizing internal equity may strengthen structural cohesion and user navigation, those prioritizing external equity gain broader scholarly recognition and connectivity. Achieving an optimal balance between these approaches is essential for sustaining digital visibility and academic influence, a pattern consistent with findings reported in earlier webometric research (11). Evaluation of usability and user-oriented features reveals notable limitations across the repositories. The restricted availability of update indicators, frequently asked questions, submission guidelines and interactive discussion forums suggests that many repositories remain predominantly content-centric, with limited emphasis on user engagement and participatory functionality. Although improvements are evident in the inclusion of navigational aids such as sitemaps, the overall absence of interactive and guidance-based features may constrain user participation and content contribution. Similar deficiencies have been highlighted in prior assessments of institutional web platforms, indicating a persistent gap between technical infrastructure and user-centred design (36, 37).

The integration of repositories with major global scholarly platforms represents a significant strength, positioning them within the broader academic communication ecosystem. Platforms that support discovery and citation serve as essential gateways for enhancing academic visibility, while interactive platforms facilitate scholarly networking and engagement. Despite these advantages, such integration alone does not fully offset challenges related to link stability, transparency and user support mechanisms. Overall, the findings indicate that while global repositories have achieved substantial online recognition, sustained improvement in technical consistency, transparency and user engagement is critical. Mid-tier repositories demonstrate comparatively stable growth patterns, whereas smaller repositories require targeted digital strategies to strengthen their long-term web presence and scholarly impact.

Conclusion

The present study provides a systematic assessment of the web performance of ten prominent global repository websites, revealing notable differences in visibility, authority and linking behaviour. Among the repositories

analyzed, ADS consistently delivers superior web performance, achieving the highest DA and PA scores. This finding reinforces earlier evidence identifying ADS as a leading global repository in terms of web presence and content availability. Despite generally strong internal and external linking structures across repositories, the relatively low Page Authority scores observed in several cases indicate the need for further optimization at the individual webpage level.

Effective repository performance in the digital environment depends not only on content volume but also on website quality, usability and functional efficiency. Enhancing user engagement through interactive features, such as blogs and real-time communication tools, can improve visibility and user retention. The cautious adoption of advanced web technologies, including Web 3.0 tools, may further support improved content management, enhance transparency and strengthen trust in repository platforms.

From a practical perspective, while the findings are specific to the repositories examined in this study, they suggest several measures that repository administrators and institutional managers may consider to strengthen repository web presence. Priority may be given to expanding high-quality scholarly content, maintaining optimized web architecture and improving internal navigation structures to enhance DA, PA and Internal Equity-Passing Links. Addressing gaps in user-oriented features identified in the web content analysis, such as submission guidelines, FAQs and informational sections on awards, grants and fellowships, may further improve usability and user engagement. Developing authoritative external backlinks and strengthening integration with major global scholarly platforms, alongside regular monitoring of webometric indicators, including WIF, DA and PA, may support evidence-based management and sustained improvement in repository visibility and global web impact. Furthermore, repository administrators may consider integrating artificial intelligence–supported approaches, such as metadata enrichment, AI-assisted content classification and indexing optimization, as a potential enhancement to enhance discoverability and strengthen web visibility.

While MOZ enabled consistent comparative webometric evaluation, reliance on a single analytical tool represents a limitation; future studies may incorporate multiple backlink analysis platforms (e.g., Ahrefs and Majestic) for cross-validation.

Overall, the study underscores the importance of sustained technical development and strategic web optimization in enhancing the long-term effectiveness and scholarly impact of repository websites.

Abbreviations

DA: Domain Authority, EWIF: External Web Impact Factor, FAQ: Frequently Asked Questions, HTTPS: Hypertext Transfer Protocol Secure, IWIF: Internal Web Impact Factor, PA: Page Authority, SEO: Search Engine Optimization, SWIF: Simple Web Impact Factor, URL: Uniform Resource Locator, WIF: Web Impact Factor.

Acknowledgement

The authors express sincere gratitude to the administrators and technical teams of the ten global repositories examined in this study for maintaining publicly accessible platforms that enabled this research. Special thanks to MOZ software developers for providing the analytical tools necessary for webometric evaluation.

Author Contributions

Abid Rasool: conceptualization, methodology, data collection, data analysis, initial drafting of the manuscript, Khusbu Thakur: review, final drafting of the manuscript, Suhail Nabi: manuscript review, proofreading, refinement.

Conflict of Interest

The authors declare no competing interests or conflicts that could influence the objectivity of this research.

Data Availability

The webometric data analysed in this study was collected from publicly accessible repositories using MOZ software.

Declaration of Generative AI and AI Assisted Technologies in the Writing Process

The author used AI tools to enhance language quality and refine the text, focusing on grammar and sentence structure.

Ethics Approval

This study analysed publicly available website data and did not involve human subjects, personal data collection, or sensitive information. Therefore, formal ethics approval was not required.

Funding

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

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How to Cite: Rasool A, Thakur K, Nabi S. A Webometric Study of Prominent Global Repositories. Int Res J Multidiscip Scope. 2026; 7(2): 1568-1581. DOI: 10.47857/irjms.2026.v07i02.09121