
Preserving Knowledge in a Click: The Strategic Impact of Institutional Repository Software on Modern Libraries

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Abstract

Institutional repository (IR) software is crucial for libraries as it provides a centralised platform for managing, storing, and disseminating digital content. This research explores the role of IR software in the digital age, analyzing scholarly publications from databases like Scopus, Web of Science, Taylor & Francis, and Google Scholar. IR software enhances open access initiatives, research visibility, and institutional branding. However, challenges like limited technical expertise, funding constraints, metadata quality issues, and faculty engagement hinder its adoption. The study suggests a multi-stakeholder approach for the effective implementation of IR systems.

Keywords

Institutional Repository; Digital Library Software;
Digital Libraries
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1. Introduction

In the contemporary, rapidly evolving digital environment, libraries have experienced a profound transformation, transitioning from traditional custodians of physical books and journals to dynamic, technology-driven knowledge hubs. This transformation has been significantly propelled by the increasing demand for open access, digital preservation, and the dissemination of scholarly outputs. A pivotal advancement in this evolution is the adoption of Institutional Repository (IR) software, which has redefined the roles of libraries by facilitating open access to academic works, enhancing research visibility, and supporting long-term digital preservation initiatives (Mooketsi, 2020). Institutional repositories function as digital archives that collect, store, manage, and provide access to the intellectual output of an institution, encompassing research articles, theses, dissertations, conference papers, datasets, and other scholarly content (Nemati-Anaraki & Tavassoli-Farahi, 2018). These repositories are designed to benefit both the academic community and the general public, playing a critical role in ensuring that valuable research remains accessible, discoverable, and preserved for future generations. Through the implementation of IR software, libraries are actively engaging with the open science movement, working to eliminate access barriers, and promoting the democratisation of information, thereby fostering equity in knowledge dissemination across diverse geographic and economic divides.

Technological advancements have led to the development of robust IR platforms, including DSpace, EPrints and Greenstone. These systems provide a wide range of functionalities, such as metadata management, content indexing, interoperability with other systems, and compliance with global standards (Sivasubramanian & Gomathi, 2018). By utilising these IRS, libraries can more effectively organise institutional knowledge, foster collaboration among researchers, and enhance their institution's academic reputation. Moreover, institutional repositories serve as essential tools for research assessment and institutional branding. By prominently showcasing faculty publications, research projects, and student theses in a centralized digital space, libraries contribute to enhancing the visibility and impact of institutional research. This increased visibility, in turn, supports university rankings, attracts funding opportunities, and encourages academic collaboration on a global

scale(Marsh, 2015). The role of librarians has also undergone significant transformation within this new context. No longer solely custodians of physical materials, they have evolved into digital curators, metadata specialists, and advocates for open access. Their involvement in managing IR software encompasses policy development, content curation, the application of metadata standards, user training and rights management responsibilities that are crucial for the success and sustainability of these digital repositories. This paper explores the multifaceted role of institutional repository software across various library types in the digital age. It examines the benefits, challenges, and best practices associated with the deployment of IRS and highlights how libraries can effectively utilise these tools to promote knowledge sharing, enhance research impact, and ensure successful digital preservation in the current scenario.

2. Objectives

1. To examine the evolution and importance of IR software in the context of modern libraries.
2. To explore the key features and functionalities of IR software used in academic and research libraries.
3. To determine how IR software contributes to knowledge preservation, open access, and scholarly communication.
4. To analyze the impact of IR systems on library services, workflows, and user engagement in the digital era.
5. To identify the challenges faced by libraries in implementing IR software and suggest measures to overcome.

3. Methodology

The methodology employed in this research comprised a literature review that examined the role of IR software within libraries, particularly in the context of the digital era. This review encompassed peer-reviewed articles and scholarly publications dated from 2015 to 2025, obtained from esteemed databases including Scopus, Web of Science, Taylor & Francis, and Google Scholar. A thorough search strategy was implemented, utilising keywords such as “institutional repository software,” “library digitisation,” “digital libraries,” and “open access repositories.” The inclusion criteria were restricted to articles published in English, specifically focusing on academic, public, or special libraries that utilise IR software for the management and dissemination of

digital content. Articles that did not pertain to library science or that lacked substantial discourse on IR software were excluded from consideration. The selection of relevant articles was conducted through a two-phase screening process i.e. an initial review of titles and abstracts followed by a comprehensive full-text analysis. Data extraction and thematic analysis were conducted to identify recurring trends, challenges, benefits, and the evolving role of IR software in enhancing library services within the digital age. The methodology ensured a balanced representation of global perspectives and technological advancements, thereby providing a robust framework for assessing how libraries employ IR tools to facilitate knowledge preservation, access, and scholarly communication.

4. Institutional Repositories

IRS serve as a digital archives that collect, preserve, and disseminate the intellectual output of institutions, predominantly those engaged in academic or research endeavours. These repositories typically include a diverse array of content, such as theses, dissertations, research articles, conference papers, datasets, and various other scholarly materials produced by faculty, students, and staff. By providing open access to this content, IRs promote the principles of knowledge sharing, academic transparency, and enhanced visibility of research(Chukwueke et al., 2020). They play a critical role in preserving the institutional memory and ensuring long-term access to scholarly work, particularly that which may be unavailable through conventional publishing channels. Furthermore, IRs extend the global reach of an institution's research by rendering it discoverable through search engines and academic databases. They also assist in compliance with funding mandates that require open access to publicly funded research(Demetres et al., 2020). Usually managed by university libraries or research departments, these repositories adhere to established metadata standards and preservation practices to ensure reliability and accessibility. Overall, institutional repositories are indispensable tools in the dynamic landscape of scholarly communication, bridging the gap between knowledge creators and users while fostering a more open and collaborative academic environment.

5. Institutional Repository Software

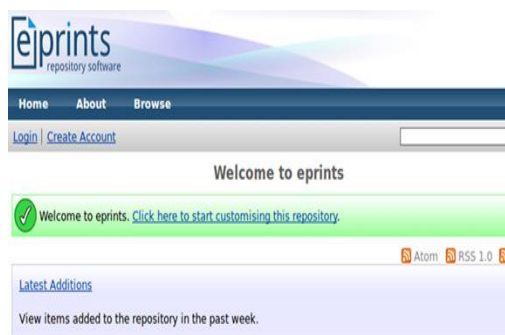


Figure 1. IR Software – Eprints, Greenstone and DSpace

The evolution of IR software commenced in the early 2000s as a response to the increasing demand for open access to scholarly materials (Tzoc, 2016). DSpace, developed collaboratively by the Massachusetts Institute of Technology (MIT) and HP Labs in 2002, emerged as one of the earliest and most influential IR systems, offering a scalable and flexible solution for managing digital content (Bajpai & Lohiya, 2018). Concurrently, EPrints, created at the University of Southampton, became the inaugural software specifically designed for open-access archives. These platforms enabled institutions to manage various digital content types, ranging from research articles and theses to datasets and multimedia files (Ukwoma & Okafor, 2017). Over time, additional repository solutions such as Fedora Commons, Islandora, and Invenio were developed, each introducing unique features such as linked data support, modularity, or integration with content management systems (Khan & Sheikh, 2022). More recently, open-source platforms like Samvera,

formerly known as Hydra and Dataverse, have made significant contributions to the evolution of repository infrastructure, focusing on collaboration, interoperability, and long-term digital preservation (Cariani & Green, 2020). Currently, IR software plays a vital role in scholarly communication, facilitating global access to academic resources while promoting institutional visibility and compliance with open-access mandates.

5.1 Types of IR Software

IR software can be classified into Open Source, Commercial/Proprietary, Cloud-Based or Hosted Services, and Hybrid or Integrated Systems, each presenting distinct features tailored to address varying institutional requirements (Nayak & Mohapatra, 2021). Open-Source IR Software includes platforms such as DSpace, developed by MIT and HP, which is widely utilised for managing academic content with robust metadata support, and EPrints, created at the University of Southampton, recognised for its configurability and advocacy for open access (Kumar & Amsaveni, 2021). Commercial or Proprietary IR Software offers professional support and seamless integration. Notable examples include Digital Commons by bepress, which provides an easy-to-use hosted platform with editorial workflows, and Ex Libris Esploro, which integrates with library systems to manage research outputs (Cho, 2022). Cloud-Based or Hosted Services diminish IT overhead and foster collaboration. Zenodo, developed by CERN, is a free platform that promotes open science, while the Open Science Framework (OSF) assists research teams in managing and sharing projects throughout the research lifecycle (Sinhbabu et al., 2022). Hybrid or Integrated Systems merge repository functionalities with broader research management. Pure and Converis are CRIS platforms that integrate research output tracking with repository capabilities, frequently employed in Europe (Fernandes, 2018). Each category of IR software caters to differing institutional objectives, encompassing open access, compliance, collaboration, and extensive data integration.

5.2 Features of IR Software

IR software encompasses a comprehensive array of features designed to effectively manage, preserve, and disseminate scholarly content. Central to its functionality is robust content management, which facilitates submission workflows, batch uploads, and the handling of multiple content types, including

articles, theses, datasets, and multimedia resources, along with version control. The management of metadata is enhanced through compatibility with various schemas, such as Dublin Core and MARC, alongside metadata harvesting capabilities via OAI-PMH and the implementation of authority control to standardize author names and subjects (Kar & Das, 2020). The software ensures secure access through customizable user roles, embargo options, and integration with authentication systems such as LDAP and Shibboleth. In terms of discoverability, it incorporates advanced and full-text search functionalities, filtering options, and search engine optimisation (SEO) strategies that improve user access and visibility on platforms like Google Scholar (Marsh, 2015). The software adheres to global interoperability standards by providing DOI and ORCID integration and enabling citation exports in multiple formats. Furthermore, embedded analytics tools facilitate the tracking of usage statistics and the generation of custom reports for stakeholders (Kouis et al., 2021). To secure long-term access, the software supports digital preservation practices, including bitstream integrity checks and integrations with LOCKSS or Archivematica. Customization features permit institutional branding and multilingual support, enabling adaptation to institutional identity and user requirements (Barrueco & Termens, 2022). Ultimately, IR systems integrate seamlessly with external platforms such as library catalogs, Current Research Information Systems (CRIS) like PURE, and learning management systems, thereby reinforcing their role as a central hub within academic ecosystems.

5.3 Requirements for Integration of IR Software

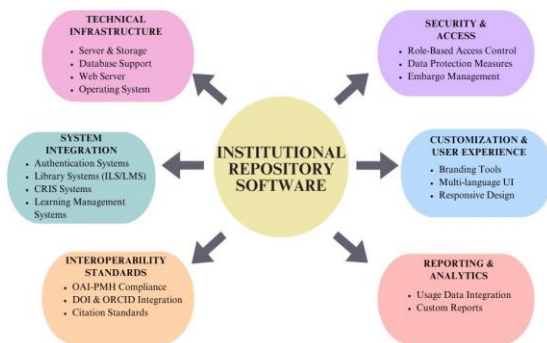


Figure 2. Requirements for Integration of IR Software

The integration of IR software within an academic or research environment necessitates a clearly defined set of technical, functional, and user-oriented requirements. At the foundation is a robust technical infrastructure, which entails reliable servers, scalable storage solutions, compatible databases such as Postgresql or Mysql, and web servers like Apache or Nginx, preferably hosted on Linux systems (Eromosele, 2019). Effective system integration is paramount, requiring seamless connectivity with authentication systems such as LDAP or Single Sign-On (SSO), library systems for MARC exports, CRIS platforms such as PURE, and learning management systems like Moodle or Blackboard (Mattigiri et al., 2025). Adherence to interoperability standards is essential for achieving global reach, including OAI-PMH for metadata harvesting, DOI and ORCID for persistent identification, and support for standard citation formats such as BibTeX and EndNote (Awan et al., 2022). Furthermore, strong security measures and access control provisions are necessary, featuring role-based access, SSL encryption, secure backups, and embargo functionalities. Additionally, IR software should offer customisation options, including institutional branding, multilingual support, and responsive interfaces that are mobile-friendly to enhance accessibility and user engagement. At last, robust analytics and reporting tools, including integration with platforms like Google Analytics and features for customised reporting, empower administrators and departments to effectively track usage and impact (O'Brien et al., 2017). These comprehensive requirements ensure that the repository operates as a secure, interoperable, and user-centric platform for scholarly communication.

6. Role of IR Software in Libraries

IR software acts as a centralized system for archiving scholarly materials, including research articles, theses, dissertations, conference papers, datasets, and multimedia resources. Consequently, they support open access initiatives while enhancing the global visibility of academic work (Sivasubramanian & Gomathi, 2018). Software solutions such as DSpace, EPrints, and Greenstone offer robust features for metadata management, long-term digital preservation, interoperability with external systems, and accommodation of multiple content types. These functionalities position them as essential tools for libraries seeking to improve access to institutional

knowledge. For instance, the libraries at Eastern University, Sri Lanka, utilise DSpace to manage and provide open access to the institution's digital content, promoting global research visibility (Navirathan & Jeyakanathan, 2018). Similarly, the University of Glasgow uses EPrints to archive and share academic publications, supporting its open access policy (McCutcheon & Eadie, 2016). By adopting these platforms, libraries not only preserve academic heritage but also engage actively in the research lifecycle, fostering scholarly communication and increasing citation rates through wider dissemination. Moreover, IRs contribute to institutional branding by showcasing faculty and student work, thereby reinforcing the academic reputation of the institution. Additionally, IRs align with global trends in open science and data sharing, rendering them indispensable for promoting transparency, collaboration, and innovation in research (Tzanova, 2020). As libraries evolve into digital information hubs, IR software plays a transformative role, enabling them to transcend traditional resource curation functions and become active contributors to the production and dissemination of academic knowledge (Ranavagol et al., 2024). In this context, IRs represent not only technological tools but also strategic assets in fulfilling the mission of libraries within the digital scholarly ecosystem.

6.1 Role of IR Software in Various Library Types

IR software significantly enhances information management across different types of libraries, including national, public, academic, special, and industrial libraries. In national libraries, IR software enables the centralized archiving and dissemination of a nation's cultural heritage, research outputs, and official documents, thereby supporting national digital preservation efforts. For public libraries, IR software promotes community engagement by providing open access to local collections, educational resources, and governmental data, thus facilitating social inclusion (Vassilakaki & Moniarou-Papaconstantinou, 2015). In academic libraries, IR systems streamline the management and sharing of scholarly work, research publications, and student theses, thereby supporting open access and enhancing institutional visibility. Special libraries, which serve specific research sectors, benefit from IR software by effectively organising specialised collections, facilitating knowledge sharing, and ensuring the preservation of proprietary information (Joo et al.,

2019). In industrial libraries, IR software supports the management of technical documentation, patents, and research data, thereby fostering innovation and improving knowledge transfer within organizations (Tait et al., 2016). IR software optimises repository management, promotes accessibility, and encourages knowledge sharing across diverse library environments, each catering to unique user needs and organisational objectives.

6.2 The Impact of IR Software on Libraries

IR software has emerged as an essential tool in promoting open access and increasing the visibility of institutional research outputs. Traditionally regarded as custodians of physical resources, libraries have adapted to become digital content curators, utilizing IR platforms to archive theses, dissertations, articles, and datasets. These tools support the academic missions of institutions by facilitating long-term preservation and accessibility, thereby aligning with the evolving practices of research dissemination (Demetres et al., 2020). Furthermore, IR platforms have empowered libraries to assume an active role in scholarly communication by fostering collaboration among librarians, faculty, and researchers. The adoption of IR software has also compelled libraries to cultivate new competencies in metadata creation, copyright management, and digital preservation. Nonetheless, institutional repositories encounter several challenges, including low levels of faculty participation, sustainability concerns, and the necessity for robust technical infrastructure (Gul & Bano, 2019). The success of an IR frequently depends on the commitment of the institution and the strategic integration of repository initiatives into broader library services. Consequently, libraries must balance the technical demands of managing IR software with advocacy and outreach efforts to encourage content submission and usage (Marsh, 2015). The impact of IR software on libraries is multifaceted, promoting a shift toward digital scholarship while concurrently redefining the library's role in knowledge production and access.

7. Challenges in the Adoption of IR Systems in Libraries

The implementation of IR software within libraries presents numerous challenges that inhibit its widespread adoption and optimal functionality. A primary concern is the lack of technical expertise among library personnel, which adversely affects the management and maintenance of IR platforms. Many

libraries, particularly those in developing countries, face additional difficulties related to inadequate funding and insufficient infrastructure, such as unreliable internet connectivity and limited access to modern computing systems (Joo et al., 2019). Furthermore, resistance to change among staff and faculty complicates the implementation process, as some individuals exhibit reluctance to deposit materials due to apprehensions regarding copyright, plagiarism, and the perceived value of open access. The absence of clear institutional policies and mandates for content submission further hinders consistent content growth within repositories (Yang & Li, 2015). Additionally, challenges associated with metadata creation and quality control are significant, as poor metadata can restrict discoverability and interoperability with other systems. Sustainability issues, encompassing long-term preservation and software upgrades, also pose ongoing obstacles for libraries striving to maintain robust IR systems (Mosha & Ngulube, 2023). The literature underscores the complex nature of challenges faced in IR implementation, highlighting the necessity for a holistic approach that integrates technical, organizational, and cultural solutions to ensure the successful deployment and sustainability of institutional repositories within library environments.

8. Recommendations

The integration of IR software in libraries has increasingly garnered attention due to its potential to enhance scholarly communication. Studies emphasize the importance of strategic collaboration among librarians, institutions, and policymakers to facilitate successful IR implementation. Effective integration necessitates not only robust technological infrastructure but also strong institutional commitment, user engagement, and the development of comprehensive policies. Librarians serve a critical role as facilitators and require ongoing training and support to effectively manage metadata, address copyright issues, and ensure digital preservation (Esse & Haliso, 2024). Institutions must prioritise funding and infrastructure while fostering a culture that promotes self-archiving and open access. Policymakers are encouraged to establish national mandates and incentives that align with global movements towards open access (Asadi et al., 2019). Barriers such as lack of awareness, resistance to change, and insufficient technical skills must be addressed through coordinated policies and awareness programs. Overall, a multi-stakeholder approach involving clear policies, advocacy, and

sustainable technical support is essential for the effective adoption of IR software within academic libraries (Ezema & Okafor, 2015).

9. Conclusion

IR software enhances the visibility and impact of research, supports open access initiatives, and reinforces the academic reputation of institutions by offering a centralized platform for the storage and access of digital content. Libraries, functioning as facilitators of knowledge, have adopted IR systems to fulfil their evolving responsibilities in digital preservation and scholarly communication. Despite challenges such as limited technical expertise and resource constraints, the continued development and adoption of user-friendly, interoperable IR platforms have the potential to strengthen digital infrastructure within libraries globally. Looking forward, this study highlights the prospects for IR software to integrate with emerging technologies, such as artificial intelligence, linked data, and cloud computing, thereby providing more dynamic and personalised user experiences. Furthermore, future research may investigate the role of IRs in supporting data curation, assessing research impact, and fostering collaboration across institutions. As the academic landscape increasingly transitions to a digital and data-driven paradigm, institutional repositories will play a critical role in shaping the future of scholarly communication and ensuring sustained access to knowledge within the library ecosystem.

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