

Institutional Repositories are tools to Promote Open Science in India: A Study of Central Universities

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Abstract

The paradigm of scholarly communication has undergone a significant transformation with the emergence of Open Science, which emphasises transparency, accessibility, collaboration, and reproducibility of research. Institutional Repositories (IRs) have become central to this transformation by providing digital platforms for the collection, preservation, and dissemination of academic outputs. In India, the development of IRs has gained momentum with the support of national initiatives such as INFLIBNET, Shodhganga, and the National Digital Library of India (NDLI). This study critically examines the role of Institutional Repositories in promoting Open Science in India, with a specific focus on central universities in Uttar Pradesh. Using a descriptive and analytical methodology based on secondary data, the study evaluates the infrastructure, accessibility, content diversity, and usage patterns of IRs. The findings indicate that IRs significantly enhance research visibility, accessibility, and collaboration. However, challenges such as a lack of awareness, inadequate policies, limited technical infrastructure, and low participation levels hinder their effectiveness. The study concludes that strengthening institutional frameworks, improving digital infrastructure, and promoting awareness are essential for the impact of IRs in advancing Open Science in India.

Keywords:- Institutional Repositories, Open Science, Open Access, Uttar Pradesh, Digital Libraries, Scholarly Communication, INFLIBNET, Research Visibility, Knowledge Management.

Introduction

The digital revolution has profoundly reshaped the way knowledge is created, shared, and consumed. Traditional scholarly communication systems, dominated by subscription-based journals, have often restricted access to knowledge due to high costs and limited availability. The emergence of Open Science has challenged this model by advocating for unrestricted access to research outputs and transparent research processes. Open Science aims to make scientific research, data, and dissemination accessible to all levels of society, removing traditional barriers related to cost, access, and visibility.

Institutional Repositories (IRs) are a cornerstone of this movement. IRs are digital archives that collect, preserve and disseminate the scholarly output of an institution. These repositories typically include a variety of academic materials such as research articles, theses, dissertations, conference papers, datasets and other digital assets created by faculty, students and staff. By supporting open access, enhancing research visibility, promoting knowledge equity, ensuring preservation, and encouraging collaboration, IRs significantly contribute to the advancement of Open Science.

They enable institutions to preserve their intellectual output and make it freely accessible to a global audience. In developing countries like India, IRs play an even more critical role in democratizing access to knowledge.

Uttar Pradesh, with its vast network of central universities, provides a significant context for examining the adoption and impact of IRs. Despite progress, disparities exist in infrastructure and implementation.

Roles of Institutional Repositories in Promoting Open Access :

Institutional Repositories (IRs) have emerged as a vital component in the evolving landscape of scholarly communication, particularly in the context of Open Access. Open Access aims to make scientific research, data, and dissemination accessible to all levels of society, removing traditional barriers related to cost, access, and visibility. In this regard, IRs serve as powerful digital platforms that collect, preserve, and disseminate the intellectual output of academic institutions. By supporting open access, enhancing research visibility, promoting knowledge equity, ensuring preservation, and encouraging collaboration, IRs significantly contribute to the advancement of Open Access.

Open Access Facilitation:

One of the most fundamental roles of Institutional Repositories is to facilitate Open Access (OA) to scholarly content. Traditionally, access to academic publications has been restricted due to expensive journal subscriptions and licensing agreements. This has created a divide between those who can afford access and those who cannot. IRs help bridge this gap by enabling institutions to archive and share their research outputs freely.

Through IRs, various types of scholarly materials—such as theses, dissertations, preprints, post prints, research articles, conference papers, and datasets—are made openly available to users worldwide. This ensures that knowledge is not confined within institutional boundaries or limited to privileged groups. Open access facilitated by IRs also aligns with global initiatives such as the Budapest Open Access Initiative and Plan S, which advocate for unrestricted access to publicly funded research.

Furthermore, IRs often operate using open-source software platforms such as DSpace and EPrints, making them cost-effective and sustainable solutions for institutions. By removing financial and legal barriers, IRs democratize access to knowledge and support the fundamental principle that publicly funded research should be publicly accessible.

Research Visibility:

Institutional Repositories play a crucial role in enhancing the visibility and impact of research outputs. When scholarly works are deposited in IRs, they become indexed by search engines like Google Scholar, increasing their discoverability. This leads to greater dissemination of research findings beyond the immediate academic community.

Numerous studies have shown that open-access publications tend to receive higher citation rates compared to those behind paywalls. This “citation advantage” is a significant incentive for researchers to deposit their work in IRs. Increased visibility not only benefits individual researchers by improving their academic profile and impact but also enhances the reputation and ranking of their institutions.

In addition, IRs provide persistent identifiers and standardised metadata, which improve the organisation and retrieval of research outputs. This structured approach ensures that research is easily accessible and traceable over time. As a result, IRs act as powerful tools for showcasing institutional research productivity at both national and international levels.

Knowledge Democratisation:

A key objective of Open Science is to ensure that knowledge is accessible to everyone, regardless of geographical, economic, or institutional constraints. Institutional Repositories contribute significantly to this goal by promoting knowledge democratisation.

In countries like India, where disparities exist between urban and rural educational institutions, IRs help bridge the information gap. Researchers and students from underfunded or remote areas can access high-quality academic resources without incurring costs. This fosters inclusivity and equal opportunities for learning and research.

Moreover, IRs support lifelong learning by providing access to knowledge beyond formal academic settings. Independent researchers, policymakers, industry professionals, and the general public can benefit from open

access to scholarly content. This broadens the societal impact of research and ensures that knowledge contributes to social and economic development.

By enabling free and equitable access to information, IRs uphold the principle that knowledge is a public good and should be shared widely for the benefit of society.

Preservation:

Another critical role of Institutional Repositories is the digital preservation of scholarly content. Academic research represents valuable intellectual capital that must be safeguarded for future generations. IRs ensure the long-term storage, maintenance, and accessibility of research outputs in digital form.

Digital preservation involves the use of standardised formats, metadata, and backup systems to protect content from technological obsolescence, data loss, or degradation. IRs often implement preservation strategies such as regular data backups, format migration, and adherence to international standards like the Open Archival Information System (OAIS) model.

By preserving theses, dissertations, research articles, and other scholarly materials, IRs maintain the continuity of the academic record. This is particularly important in the digital age, where information can easily be lost due to hardware failures, software changes, or a lack of proper archiving.

Furthermore, IRs provide persistent access through stable URLs and identifiers, ensuring that research remains accessible over time. This long-term preservation not only protects intellectual heritage but also supports ongoing research by allowing future scholars to build upon existing knowledge.

Collaboration:

Institutional Repositories also play a significant role in fostering collaboration and interdisciplinary research. By making research outputs openly accessible, IRs enable scholars from different institutions, disciplines, and countries to access and utilise existing research.

Open access to research encourages knowledge sharing and reduces duplication of efforts. Researchers can identify gaps in existing studies, explore new perspectives, and collaborate on innovative projects. This is particularly important in addressing complex global challenges that require interdisciplinary approaches, such as climate change, public health, and sustainable development.

IRs also facilitate collaboration by integrating with other digital platforms and networks, such as research databases, academic social networks, and open data repositories. This interconnected ecosystem enhances the flow of information and promotes a culture of openness and cooperation in research.

In addition, IRs support the sharing of not only publications but also datasets, software, and research methodologies. This aligns with the broader principles of Open Science, which emphasise transparency, reproducibility, and reuse of research outputs.

By encouraging collaboration, IRs contribute to the creation of a dynamic and inclusive research environment where knowledge is co-created and shared for the advancement of science and society.

Objectives of the Study:

The study is conducted with the following objectives:

1. To identify the Institutional Repositories available in Central Universities of Uttar Pradesh.
2. To examine the role of Institutional Repositories in promoting Open Science.
3. To analyze the types of scholarly resources available in the repositories.
4. To study the software and technologies used for repository development.
5. To evaluate accessibility, usability, and visibility features of the repositories.

6. To identify challenges faced by universities in maintaining Institutional Repositories.

Scope of the Study:

The scope of the study is limited to the Institutional Repositories of Central Universities located in Uttar Pradesh. The study focuses only on repositories accessible through university websites and digital library portals.

Literature Review :

Studies indicate that IRs enhance visibility and citation impact of research. Studies in India show increasing adoption of DSpace-based repositories. However, many repositories remain underutilized due to lack of awareness and institutional mandates.

Recent literature also highlights the integration of IRs with Open Science frameworks, including open data and reproducibility practices. The concept of Open Science has gained significant attention in recent years, with Institutional Repositories (IRs) and university libraries emerging as critical components in its implementation. A review of recent national and international studies reveals the evolving role of university repositories and libraries in building Open Science infrastructure at the institutional level.

A study by M. Kulyk and A. Gladysheva (2025) examined the **Role of University Repositories in the Formation of Open Science Infrastructure and Strategy at the Institutional Level : Domestic and Foreign Experience (Using the Example of Lithuania)**

The authors emphasize that university repositories are not merely storage systems but serve as foundational infrastructure for Open Science ecosystems. Their research highlights that repositories support the organization, preservation, and dissemination of scholarly outputs, thereby strengthening institutional research strategies. By applying analytical methods such as synthesis, comparison, and generalization, the study demonstrates that repositories contribute significantly to building a structured and accessible research environment at both national and institutional levels.

The findings of this study are particularly relevant in the Indian context, where universities are increasingly adopting digital repositories but often lack a comprehensive Open Science strategy. The effectiveness of IRs depends on their integration into broader institutional policies and research frameworks, rather than their standalone existence.

Another important contribution is made by Ecaterina Scherlet (2024), who explored **The Role of the University Library in Promoting Open Science**. The study underscores the central role of university libraries in facilitating Open Science through the provision of resources, services, and infrastructure that support free access to knowledge. According to the author, modern academic libraries are transitioning from traditional information storage centers to active facilitators of open knowledge dissemination.

Scherlet (2024) highlights that university libraries contribute to Open Science by organizing and managing access to a wide range of open resources, including digital repositories, open access journals, databases, and online collections. Libraries also play a crucial role in educating users about Open Access practices, copyright issues, and data management. Furthermore, the study emphasizes the involvement of libraries in global Open Science initiatives and communities, which enhances collaboration and knowledge sharing across institutions and countries.

The study also points out that libraries act as intermediaries between researchers and digital platforms, ensuring that scholarly outputs are properly curated, indexed, and made accessible. This aligns with the broader objectives of Open Science, which aim to make research more transparent, inclusive and reusable.

Both studies collectively highlight the complementary roles of Institutional Repositories and university libraries in promoting Open Science. While repositories provide the technical infrastructure for storing and disseminating research outputs, libraries offer the organizational, educational, and service-oriented support.

Developing countries like India are still in the process of strengthening their repository infrastructure and aligning it with Open Science principles. This gap indicates the need for stronger institutional policies, better technological support, and increased awareness among stakeholders.

The reviewed literature also reveals a common limitation:

- Many repositories remain underutilized due to a lack of awareness
- Insufficient training
- Absence of mandatory deposit policies
- Absence of comprehensive citation data

In some recent studies suggest that this is still an emerging field with significant scope for further research. In conclusion, the literature establishes that Institutional Repositories and university libraries are indispensable for the advancement of Open Science. They not only enhance access to knowledge but also contribute to the development of a transparent, collaborative, and sustainable research ecosystem. However, their effectiveness depends on proper integration into institutional strategies, adequate infrastructure, and active participation from the academic community.

Research Methodology :

- The present study adopts a **descriptive and evaluative research design**. The study aims to examine the role of Institutional Repositories (IRs) in promoting Open Science practices in the Central Universities of Uttar Pradesh through the analysis of their official websites and repository platforms.
- The descriptive approach is used to identify the existing status, features, and accessibility of institutional repositories, while the evaluative approach helps in assessing their effectiveness in supporting open access, scholarly communication, research visibility, and knowledge dissemination.

Growth of Institutional Repositories in India:

India has witnessed steady growth in IRs since the early 2000s. The adoption of open-source platforms like DSpace has facilitated this growth. The following table shows a steady increase, reflecting growing awareness of Open Access.

Year	No. of Institutional Repositories
2005	20
2010	45
2015	85
2020	120
2025	160+

<u>Name of Central University</u>	<u>IR / Repository Status</u>	<u>Software Used</u>	<u>Major Features of IR System</u>	<u>Type of Content Available</u>
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Banaras Hindu University (BHU) - Varanasi	Active Institutional Repository	DSpace / Shodhganga integration	Full-text access, advanced search, Dublin Core metadata, interoperability (OAI-PMH), long-term preservation	Theses, articles, reports, rare manuscripts
Aligarh Muslim University (AMU) - Aligarh	Highly active contributor to Shodhganga	Highly active contributor to Shodhganga	Highly active contributor to Shodhganga	Highly active contributor to Shodhganga
Babasaheb Bhimrao Ambedkar University (BBAU) - Lucknow	Participating in Shodhganga	DSpace	Digital archiving, metadata management, remote accessibility, preservation facility	Theses and dissertations
Rajiv Gandhi National Aviation University (RGNAU) - Raebareli	No dedicated Institutional Repository publicly visible on university website; research resources mainly available through library and academic portals	Not clearly specified publicly	Digital access to academic resources, research support services, e-library facilities, online catalog access, scholarly communication support	Research papers, academic publications, aviation-related learning resources, e-journals, theses/dissertations (limited public visibility)
Rani Lakshmi Bai Central Agricultural University (RLBCAU) - Jhansi	Active Institutional Repository "Gyansarovar@RLBCAU" available	DSpace Open-Source Software	Open access repository, digital preservation, advanced search and	Research articles, theses, dissertations, faculty publications, reports, university

			browse facility, metadata-based retrieval, long-term archiving, institutional research visibility, LAN accessibility	publications, agricultural research documents
University of Allahabad - Allahabad	Active in Shodhganga	DSpace	Open access access, ETD submission, metadata search, digital preservation, online retrieval	Ph.D. theses, dissertations, research publications

Analysis and Interpretation :- The analysis indicates that most central universities in Uttar Pradesh are gradually adopting digital repository systems to preserve and disseminate scholarly communication. Banaras Hindu University has a well-established and active institutional repository integrated with Shodhganga through DSpace software. Its repository provides advanced features such as full-text access, interoperability through OAI-PMH protocol, Dublin Core metadata standards, and long-term digital preservation. The repository contains theses, articles, reports, and rare manuscripts, reflecting a mature digital knowledge management system.

Aligarh Muslim University is identified as a highly active contributor to Shodhganga, showing its strong participation in open-access scholarly communication. Although detailed repository features are not clearly mentioned in the table, its repeated contribution status demonstrates continuous submission of electronic theses and dissertations (ETDs) and research output at the national level.

Babasaheb Bhimrao Ambedkar University also participates actively in Shodhganga using DSpace software. Its repository focuses mainly on theses and dissertations and offers features such as metadata management, digital preservation, and remote accessibility. This indicates that the university emphasizes long-term preservation and wider accessibility of research work.

The analysis further reveals that newer universities show varying levels of IR development. Rajiv Gandhi National Aviation University does not currently have a fully visible dedicated institutional repository on its official website. However, the university provides access to digital academic resources through library portals and e-learning systems. Its resources mainly include research papers, aviation-related academic materials, and limited thesis access, indicating that the institution is still in the developmental stage of repository implementation.

In contrast, Rani Lakshmi Bai Central Agricultural University has developed an active repository named “Gyansarovar@RLBCAU” using DSpace open-source software. The repository includes advanced features

such as open-access support, metadata-based retrieval, long-term archiving, and digital preservation. The repository stores a wide variety of agricultural research materials including theses, dissertations, faculty publications, reports, and institutional documents, reflecting effective management of scholarly communication in agricultural sciences.

Similarly, University of Allahabad actively contributes to Shodhganga through DSpace-based repository services. The university repository provides ETD submission facilities, online retrieval, metadata search, and preservation support. Its major content includes Ph.D. theses, dissertations, and research publications, promoting open access to academic research.

Overall, IRs not only support the dissemination of knowledge but also contribute to the broader goals of transparency, inclusivity, and innovation in research. As Open Science continues to gain momentum globally, the role of Institutional Repositories will become increasingly important in shaping the future of academic scholarship.

Conclusion :- Overall, the table demonstrates that DSpace is the most commonly used software platform among central universities in Uttar Pradesh because of its open-source nature, interoperability, and digital preservation capabilities. Most universities are linked with Shodhganga for ETD submission and open-access dissemination. The study also shows that while older and established universities possess stronger IR infrastructures, some newer institutions are still developing dedicated repositories and digital preservation systems. In conclusion, Institutional Repositories serve as a backbone in the promotion of Open Science by facilitating open access, enhancing research visibility, democratizing knowledge, ensuring digital preservation, and fostering collaboration. They transform the way scholarly communication is conducted by shifting from restricted access models to open and inclusive systems.

In the context of India, and particularly in states like Uttar Pradesh, IRs have the potential to significantly improve access to knowledge and strengthen the research ecosystem. However, their effectiveness depends on factors such as awareness, institutional support, policy frameworks, and technological infrastructure.

Institutional Repositories are essential for the advancement of Open Science. In India, they have played a transformative role in improving access to knowledge. However, in Uttar Pradesh, their full potential remains untapped due to infrastructural and policy limitations.

A coordinated effort involving government bodies, universities, and researchers is required to strengthen IR systems. With proper implementation, IRs can significantly contribute to India's vision of a knowledge-based society.

References :

1. Crow, R. (2002). The case for institutional repositories. SPARC.
2. Lynch, C. A. (2003). Institutional repositories: Essential infrastructure. *ARL Journal*.
3. Suber, P. (2012). *Open Access*. MIT Press.
4. Kuri, R. (2020). Institutional Repositories in India.
5. Mir, H. A., et al. (2021). Evaluative study of IRs in India.
6. INFLIBNET Centre Reports (2023).
7. OpenDOAR Database (2024).
8. NDLI Annual Report (2023).
9. UGC Guidelines on ETDs (2022).
10. Roy, A. et al. (2025). Open Access trends in India.