

Digital Archiving in Higher Education: The Role of Institutional Repositories in Maharashtra's State Universities

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Abstract

Digital archiving plays a pivotal role in the preservation, organization, and dissemination of scholarly materials in the landscape of higher education. With the exponential growth of digital content and the increasing need for open access, institutional repositories (IRs) have emerged as essential platforms for ensuring the long-term accessibility, security, and visibility of academic resources. These repositories facilitate seamless academic collaboration, improve the discoverability of research outputs, and enhance the overall impact of scholarly work. Institutional repositories store and manage a wide array of digital assets, including peer-reviewed research papers, doctoral theses, dissertations, conference proceedings, datasets, institutional reports, and historical archives that reflect the intellectual output of academic institutions. This research work investigates the role of institutional repositories in state universities of Maharashtra, India. It examines how these repositories contribute to academic excellence by preserving institutional memory, supporting research visibility, and promoting knowledge sharing among scholars and researchers. Furthermore, the study explores the strategies adopted for the development and maintenance of these repositories, as well as the technological frameworks and software platforms employed (such as DSpace and EPrints). The study also addresses the challenges faced in implementation, including infrastructure limitations, policy issues, lack of skilled manpower, and low awareness among stakeholders. Through the analysis of existing repositories, case studies from selected universities, and a review of best practices, the research aims to assess the current status and propose recommendations for enhancing the effectiveness of digital archiving. The findings underscore the potential of institutional repositories to serve as powerful tools for digital preservation, academic collaboration, and sustainable knowledge management in the evolving higher education environment.

Keywords: Digital archiving, institutional repositories, higher education, Maharashtra, state universities, open access

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INTRODUCTION

Higher education institutions generate vast amounts of scholarly content, including research papers, theses, conference proceedings, instructional materials, and other academic resources. With the growing emphasis on open access and digital scholarship, there is an increasing need for efficient mechanisms to store, manage, and disseminate these resources. Institutional repositories (IRs) have emerged as crucial tools for ensuring that scholarly content is not only preserved but also made widely accessible to researchers, students, and the public.

Maharashtra, home to several prestigious state universities, has been at the forefront of adopting digital archiving practices to enhance knowledge accessibility. Universities such as Savitribai Phule Pune University, University of Mumbai, and Shivaji University have developed institutional repositories that serve as digital libraries for preserving and sharing research. These repositories offer a range of benefits, including increased citation impact, compliance with open-access mandates, and long-term knowledge preservation. However, their implementation comes with various challenges, including technological barriers, financial constraints, and issues related to intellectual property rights [1–3].

The rapid advancement of information and communication technologies has further transformed the landscape of academic archiving. With the integration of artificial intelligence (AI) and machine learning, institutional repositories are evolving to provide smarter search functionalities, automated metadata tagging, and predictive analytics for research trends. Additionally, emerging technologies like blockchain hold the potential to enhance the security and authenticity of digital archives, ensuring the reliability of stored information.

This study aims to explore the current state of institutional repositories in Maharashtra's state universities, analysing their role in digital preservation, scholarly communication, and academic resource management. It also identifies key challenges that hinder the effective adoption of IRs and proposes best practices for improving their functionality. By providing a comprehensive analysis, this research contributes to the growing discourse on the importance of digital archiving in higher education and highlights the need for strategic policy interventions to enhance the sustainability of institutional repositories.

CONCEPT OF INSTITUTIONAL REPOSITORIES INSTITUTIONAL REPOSITORIES (IRS)

Specialized digital platforms designed to collect, store, manage, preserve, and provide open access to the scholarly output of an academic institution. These repositories serve as a centralized hub for research publications, theses, conference proceedings, datasets, and other digital resources, ensuring their long-term accessibility and visibility.

The significance of IRs lies in their ability to bridge the gap between academic research and its wider dissemination. By providing unrestricted access to institutional research outputs, they promote knowledge sharing, foster academic collaboration, and increase the impact of scholarly contributions. In addition to preserving institutional knowledge, IRs also support compliance with funding agencies' open-access mandates and facilitate interdisciplinary research by enabling easy retrieval of archived content [4, 5]. The primary objectives of IRs include:

- Enhancing visibility and accessibility of academic research.
- Supporting open access initiatives and ensuring compliance with funding mandates.
- Preserving institutional knowledge and scholarly heritage.
- Facilitating academic collaboration, knowledge dissemination, and innovation.
- Enhancing visibility and accessibility of academic research.
- Supporting open access initiatives.
- Preserving institutional knowledge.
- Facilitating academic collaboration and innovation.

OBJECTIVES

- *Preserve academic knowledge:* Ensure long-term access to scholarly works produced within universities in Maharashtra.
- *Enhance research visibility:* Improve the accessibility and dissemination of research outputs from state universities.
- *Support open access:* Foster the sharing of academic resources for global academic communities and future generations.

- *Promote collaboration:* Facilitate collaboration among academic institutions through shared repositories of knowledge.

INSTITUTIONAL REPOSITORIES IN MAHARASHTRA'S STATE UNIVERSITIES: ENHANCING DIGITAL ARCHIVING AND OPEN ACCESS

Institutional Repositories in Maharashtra's State Universities Institutional repositories (IRs) in Maharashtra's state universities play a crucial role in preserving, managing, and disseminating digital scholarly resources. These repositories ensure that valuable academic content, including research publications, dissertations, conference proceedings, and other scholarly materials, remains accessible for future generations. Universities across Maharashtra have recognized the importance of digital archiving and have established repositories to support open access, enhance academic collaboration, and increase the visibility of research output. Several state universities in Maharashtra have developed institutional repositories tailored to their academic and research needs. These include:

- *Savitribai Phule Pune University (SPPU):* The university's IR, "Shodhganga", serves as a comprehensive digital archive for doctoral theses, research papers, and faculty publications. It contributes to knowledge dissemination and enhances accessibility for scholars worldwide.
- *University of Mumbai:* The institution has implemented a digital repository initiative aimed at preserving research publications, institutional reports, and historical documents. This repository plays a significant role in academic resource management and supports open-access initiatives.
- *Shivaji University, Kolhapur:* Its digital repository offers access to research articles, faculty publications, and historical archives, ensuring that scholarly contributions are preserved and accessible to the academic community.

These universities employ advanced repository platforms such as DSpace, EPrints, and Fedora to manage and maintain their digital collections effectively. The adoption of these technologies enables universities to structure and categorize digital content efficiently, providing seamless access to researchers, students, and faculty members. Additionally, these repositories facilitate global academic exchange, allowing researchers from different parts of the world to engage with the scholarly output of Maharashtra's universities [6].

Despite the progress made, institutional repositories in Maharashtra still face challenges such as limited funding, technical constraints, and awareness gaps among faculty and researchers. Addressing these challenges through increased institutional support, technological advancements, and policy interventions can further enhance the effectiveness and sustainability of digital archiving efforts in higher education institutions.

IMPORTANCE OF DIGITAL ARCHIVING IN HIGHER EDUCATION

Digital archiving is crucial for preserving academic materials and ensuring their long-term accessibility. Key benefits include:

- *Preservation of institutional knowledge:* Institutional Repositories (IRs) play a crucial role in preserving institutional knowledge by digitally storing research outputs, ensuring their protection from physical degradation or loss over time. As digital archives, IRs provide secure, long-term storage, making academic work accessible for future generations of scholars and researchers, even as physical copies deteriorate.
- *Increased research impact:* Open access repositories significantly boost research impact by making academic work freely available to a global audience. This increased accessibility encourages more scholars to engage with the research, leading to higher citation rates. As research is shared widely, it gains greater visibility, which enhances the reputation of both the authors and their institutions in the global academic community.
- *Cost-effective access:* Institutional Repositories (IRs) offer cost-effective access by providing free, open access to academic materials, eliminating the need for expensive journal subscriptions

or paywalls. This significantly reduces the financial burden on students and researchers, particularly those from underfunded institutions or developing regions. By centralizing scholarly work in easily accessible digital formats, IRs ensure that academic resources are available to all, fostering a more inclusive and equitable research environment.

- *Compliance with open access mandates:* Many funding agencies now mandate that research outputs be made openly accessible to promote transparency and the sharing of knowledge. Institutional Repositories (IRs) ensure compliance with these requirements by offering a platform for storing and disseminating research findings to the public. This openness not only meets regulatory standards but also aligns with the growing global movement toward accessible research, facilitating broader academic collaboration and knowledge dissemination.

CHALLENGES IN IMPLEMENTING INSTITUTIONAL REPOSITORIES IN MAHARASHTRA'S STATE UNIVERSITIES

Despite their advantages, the implementation of IRs in Maharashtra's state universities faces several challenges:

- *Technical issues:* Many universities face limitations in their IT infrastructure, including inadequate storage capacity, outdated software, and insufficient technical expertise. These factors hinder effective management and smooth operation of IRs. Regular software maintenance and ensuring compatibility with newer technologies also present ongoing challenges.
- *Funding constraints:* Setting up and maintaining IRs requires significant financial investment. Many state universities struggle with budgetary constraints, which can impact the establishment of a robust repository. Ongoing operational costs, including server upkeep and software upgrades, may also pose barriers to long-term sustainability.
- *Lack of awareness:* One of the critical challenges is the lack of awareness among faculty members and researchers about the benefits of IRs. Without a clear understanding of how IRs can enhance their visibility and impact, researchers may be hesitant to upload their work, resulting in low participation and underutilization of the repository.
- *Copyright and licensing issues:* Intellectual property rights are a complex issue when it comes to digital archiving. Ensuring that research materials comply with copyright laws, and obtaining the necessary permissions for open access distribution, can be difficult. Universities need clear policies on copyright and licensing to avoid legal challenges and conflicts.
- *Sustainability and long-term maintenance:* IRs require continuous updates, technical support, and regular content additions to remain relevant. Ensuring the long-term sustainability of the repository, both financially and in terms of human resources, presents a significant challenge. Without proper planning for future maintenance, IRs may become obsolete or underused over time.

Addressing these challenges is critical for the successful implementation and continued growth of Institutional Repositories in Maharashtra's state universities [7, 8].

BEST PRACTICES AND STRATEGIES FOR ENHANCING THE EFFECTIVENESS OF DIGITAL ARCHIVING IN INSTITUTIONAL REPOSITORIES

- *Standardized metadata management:* Utilizing widely accepted metadata standards, such as Dublin Core, ensures consistent, accurate indexing and easy retrieval of digital content. This facilitates efficient searching and improves discoverability of research materials. Adhering to standardized metadata practices makes the repository more interoperable, allowing it to integrate with other systems and repositories.
- *Collaborations with national and international repositories:* Partnering with well-established national and international repositories like OpenDOAR and ROAR enhances the visibility and reach of university research. These collaborations help improve the exposure of research outputs on a global scale, promote knowledge sharing, and increase the repository's credibility within the academic community.

- *User training and awareness programs:* Conducting workshops and training sessions for faculty members, researchers, and students is essential to increase awareness about the benefits of IRs. These programs should cover the advantages of open access, the process of depositing research, and the tools available for maximizing impact. Building a strong understanding of IRs helps drive participation and engagement among university members.
- *Adoption of open-source repository software:* Using open-source platforms like DSpace and EPrints offers a cost-effective solution for managing IRs. These software solutions are flexible, customizable, and widely supported by the academic community. Open-source software reduces financial strain while providing robust features for digital archiving, making it accessible for universities with limited resources.
- *Regular system updates and maintenance:* To ensure the repository remains functional, secure, and up to date, regular system updates and technical maintenance are essential. This includes software upgrades, security patches, and system backups to protect against data loss and cyber threats. Regular monitoring and proactive management ensure that the repository can accommodate evolving technological needs and remain a reliable resource.

FUTURE PROSPECTS OF INSTITUTIONAL REPOSITORIES IN MAHARASHTRA'S STATE UNIVERSITIES

The future of Institutional Repositories (IRs) in Maharashtra's state universities is marked by several exciting developments that promise to enhance the efficiency, sustainability, and impact of these repositories. Key prospects include:

- *Integration of artificial intelligence (AI):* AI has the potential to revolutionize the way IRs function. By incorporating AI-based indexing and retrieval systems, IRs can become more efficient in organizing vast amounts of research data. AI can assist in automatic metadata tagging, improve search algorithms, and provide intelligent recommendations for users. These advancements would not only save time but also make the repository more user-friendly, enhancing the discoverability of research outputs.
- *Blockchain for secure archiving:* Blockchain technology can play a significant role in ensuring the security and authenticity of digital archives. By creating a decentralized, tamper-proof ledger, blockchain can guarantee that academic materials are preserved without any alterations or loss of data. This ensures transparency, integrity, and trust in the repository, which is particularly important for academic research, where intellectual property and data integrity are vital.
- *Government initiatives and policies:* The government is likely to strengthen its support for digital preservation by introducing policies that promote the creation, management, and accessibility of IRs in state universities. These policies may include funding for infrastructure development, guidelines for best practices, and mandates for making research publicly accessible. Government initiatives would also help standardize practices across universities, ensuring consistency and quality in digital archiving efforts throughout Maharashtra.
- *Increased funding and collaboration:* The future of IRs will benefit from public-private partnerships, which can offer both financial support and technological expertise. Collaborations between universities, government bodies, and private entities can lead to more sustainable and innovative repository solutions. Increased funding would allow universities to improve their infrastructure, enhance user services, and implement new technologies, ensuring that IRs remain functional, accessible, and continuously updated.

By embracing these developments, Maharashtra's state universities can create more robust, secure, and effective Institutional Repositories that benefit researchers, students, and the broader academic community, while contributing to the global movement for open access and digital preservation [9, 10].

CONCLUSION

Institutional repositories are indispensable for digital archiving in higher education. In Maharashtra's state universities, IRs facilitate the preservation, accessibility, and dissemination of scholarly content.

While challenges exist, adopting best practices and leveraging emerging technologies can enhance their effectiveness. Strengthening institutional policies and increasing awareness will further promote the role of IRs in advancing academic research and knowledge sharing.

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