

The Role of Institutional Repositories in Enhancing Open Access to Scholarly Resources

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Abstract: Institutional repositories (IRs) are essential digital infrastructures for managing, disseminating, and preserving the intellectual output of academic and research institutions. As key pillars of the open access (OA) movement, they provide a platform for making scholarly work freely available to a global audience, thereby overcoming the financial barriers of traditional subscription-based publishing. This paper examines the evolving role of IRs, analyzing recent developments and comparing their implementation and impact across different geographical regions.

Evidence indicates that effectively managed repositories significantly enhance the visibility and discoverability of research, which can lead to a demonstrable citation advantage for deposited works. Furthermore, they provide a crucial function in guaranteeing the long-term preservation of digital scholarly assets. However, the success of an IR is not automatic; it is contingent upon strategic integration with broader institutional OA policies, the establishment of researcher incentives for participation, and the deployment of interoperable services that connect with larger scholarly networks. The use of analytics is also vital for demonstrating value and guiding development. This analysis, drawing on contemporary policy reports and empirical studies, culminates in a series of practical, evidence-based recommendations. For universities aiming to maximize the OA potential of their repositories, these guidelines address critical areas such as policy alignment, user-friendly submission processes, and sustainable resource allocation. The objective is to empower academic libraries and institutions to transform their IRs into more dynamic and effective agents within the global scholarly communication ecosystem.

Keywords: Open Access, Institutional Repositories, Academic Libraries, Scholarly Communication, Research Impact, Digital Preservation.

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I. INTRODUCTION

Institutional Repositories (IRs) are cornerstone infrastructures within the Open Access (OA) ecosystem, providing a library-managed, "green" OA pathway that bypasses the price and permission barriers of traditional publishing. By hosting an institution's diverse intellectual output—from faculty articles and theses to datasets and grey

literature—IRs democratize access to knowledge, a principle championed by global bodies like UNESCO. They are increasingly recognized as vital components for fulfilling both national and institutional OA mandates. However, the promise of IRs is tempered by persistent challenges. A critical barrier remains low faculty deposit rates, often stemming from a lack of awareness, perceived administrative burden, or concerns about publisher policies. Furthermore, the effectiveness of IRs

is hampered by inconsistent metadata quality, which limits discoverability, and poor interoperability, which isolates repositories from the broader scholarly web. The absence of clear, mandatory institutional policies often exacerbates these issues, leaving IRs underpopulated and underutilized.

Recent analyses (2022-2025) reveal a stark contrast in regional maturation. In Europe, the strong, top-down policy framework of Plan S, coupled with initiatives like the European Open Science Cloud (EOSC), has propelled IRs into a networked, policy-aligned system. Studies by Borrego et al. (2023) highlight how national mandates in the UK and Netherlands have successfully driven content into IRs. In contrast, India's approach, as examined by Sharma & Singh

(2024), is more fragmented. While the INFLIBNET platform provides a national backbone, implementation is uneven, often relying on individual librarian advocacy rather than cohesive institutional policy, leading to challenges in content recruitment and standardization. A pragmatic roadmap for strengthening IRs must therefore be multi-faceted. It requires integrating IRs with research information management systems (CRIS) to automate population, adopting standardized metadata schemas for improved interoperability, and developing clear, institution-wide OA policies that mandate deposit. As a recent COAR (2023) report emphasizes, the future lies in evolving IRs from static silos into dynamic nodes within a global open knowledge network.



Fig 1: A Framework for IR Success

This pyramid illustrates "A Framework for IR Success" (Institutional Repository).

- Essential Foundation (Base): Policy and mandates.
- Enabling Layer (Middle): Technology (Interoperability, CRIS, User Interface).
- Value Demonstration (Apex): Engagement (Incentives, Altmetrics, Impact).

The framework shows that policy supports technology, which drives impact, creating Evidence for Reinforcing Policy in a cycle.

II. RECENT EVIDENCE AND COMPARATIVE LANDSCAPE

Recent international initiatives, such as those by OpenAIRE and the IMPACT-REPO project, advocate for a strategic repositioning of Institutional Repositories (IRs). They are no longer viewed as standalone library services but as fundamental pillars of a global open science infrastructure. The consensus is that to maximize their value, IRs must achieve robust interoperability, integrate with institutional and funder open access mandates, and employ reliable analytics to demonstrate impact (OpenAIRE, 2023; IMPACT-REPO, 2024). Empirical evidence solidifies the value proposition of well-maintained IRs. Studies consistently show that research deposited in repositories enjoys significantly enhanced discoverability, leading to increased readership and a measurable citation advantage. This impact, however, is not uniform; it is contingent upon factors like the timeliness of deposit, the version of the work (e.g., accepted manuscript), and disciplinary practices. Crucially, the benefit is maximized when repositories expose rich, standardized metadata and are seamlessly harvested by major aggregators like Google Scholar, BASE, and CORE (Borrett, 2023).

A regional comparison between Europe and India reveals distinct stages of IR maturation. Europe benefits from a coordinated, policy-driven approach. Strategic investments in networks like OpenAIRE and national aggregators have created a well-integrated ecosystem. The implementation of frameworks like the IMPACT-REPO action plan provides European institutions with clear, practical guidance on governance, metrics, and service design, leading to advanced cross-repository capabilities (LIBER Europe, 2024). In contrast, India's landscape is characterized by heterogeneity and grassroots development. While platforms like INFLIBNET provide a strong national framework, implementation is uneven. Evaluative studies (e.g., Das & Mishra, 2024) note a significant divide: a number of universities operate mature IRs, but many colleges and private institutions struggle with limited resources, a lack of specialized staff, and the absence of mandatory deposit policies. The primary challenges in the Indian context remain raising awareness, standardizing metadata practices, and large-scale capacity building.

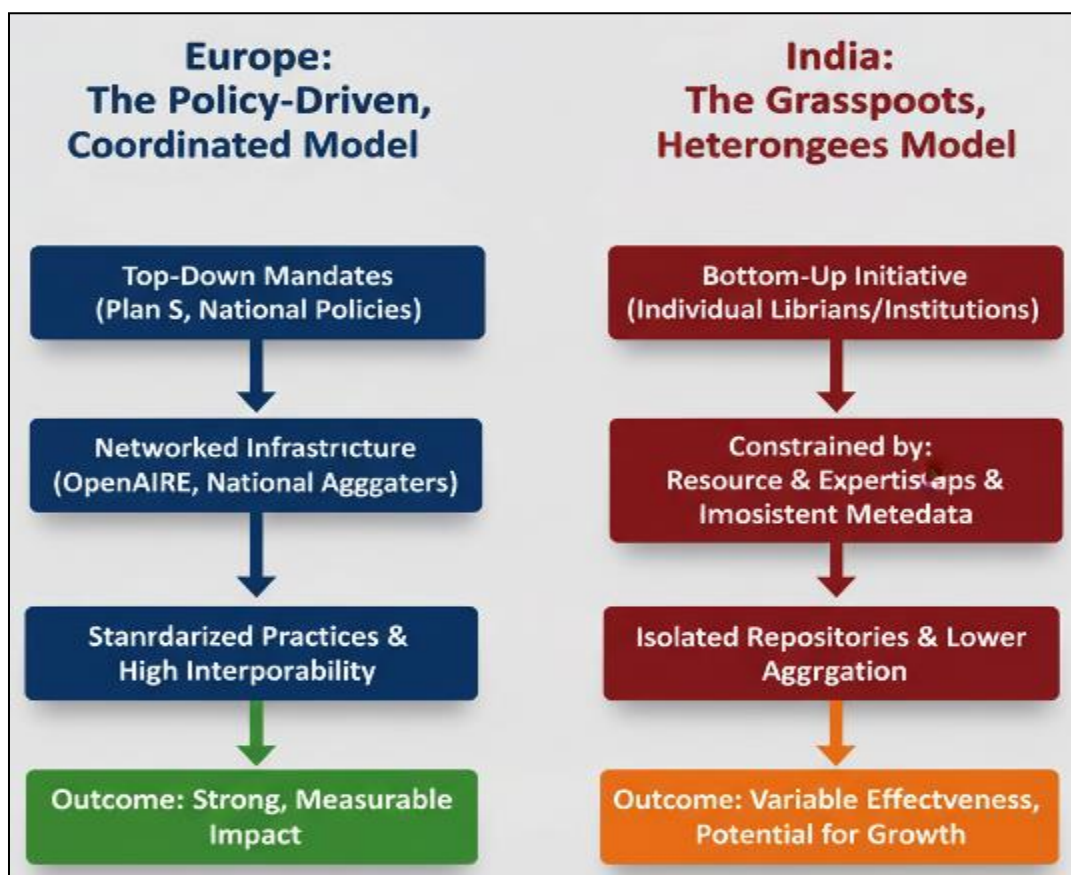


Fig 2: Institutional Repository (IR) Development Models

This flowchart contrasts two Institutional Repository (IR) development models.

- The Europe model is Policy-Driven (Plan S), leading to Networked Infrastructure (OpenAIRE), standardized practices, and Strong Impact.
- The India model is Grassroots, driven by individual efforts, constrained by resources, resulting in Isolated Repositories, and Variable Effectiveness with growth potential.

III. FUNCTIONS OF A SUCCESSFUL INSTITUTIONAL REPOSITORY

A successful Institutional Repository (IR) has evolved from a simple digital archive into a dynamic, multi-service platform central to the scholarly workflow. Its core functions are interdependent, requiring robust technological infrastructure supported by strategic institutional governance. The primary function remains open dissemination and discovery. A high-performing IR provides immediate, unrestricted access to a wide range of scholarly outputs, from preprints and theses to reports. Its impact is multiplied by ensuring rich, standardized metadata is harvested by global aggregators like Google Scholar, BASE, and OpenAIRE, dramatically increasing research visibility.

Complementing dissemination is the critical role of long-term digital preservation. This involves more than mere storage; it requires active digital curation through policies and technical

measures like checksums for file integrity and format migration plans. This function guarantees that scholarly work remains accessible and usable for future generations, safeguarding the institutional memory.

To demonstrate value, IRs must provide research assessment and analytics. They generate essential data on downloads, views, and altmetrics, which support institutional reporting, funder compliance, and help researchers evidence their impact beyond traditional citations. A defining feature of a modern IR is seamless integration into the researcher's workflow. This is achieved through APIs, synchronization with Current Research Information Systems (CRIS), and ORCID integration, which reduce the burden of manual deposit. As emphasized by COAR (2023), such integrations are vital for connecting publications to underlying data and code, upholding FAIR principles. Finally, to fully represent an institution's scholarship, the IR must support diverse research outputs. This includes hosting datasets, conference posters, teaching materials, and policy briefs, moving beyond the traditional focus on journal articles to capture the full spectrum of intellectual activity. Critically, these technical functions cannot thrive without a foundation of strong governance. This includes clear deposit mandates, expert copyright guidance, dedicated staff roles, and tangible incentives for researchers to participate. As Ferguson et al. (2024) argue, the most technologically advanced repository will fail without the policy and human support systems to sustain it.

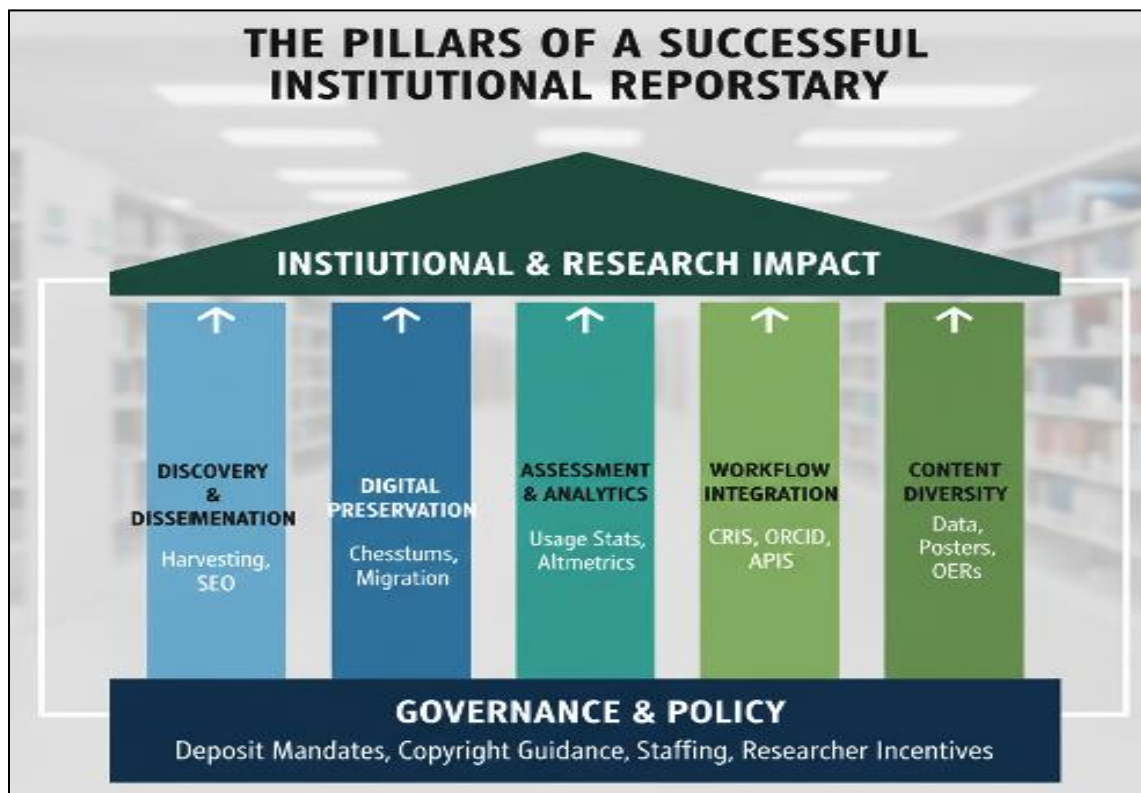


Fig 3: The Pillars of a Successful Institutional Repository

This diagram illustrates "The Pillars of a Successful Institutional Repository." The Foundation is Governance & Policy (mandates, staffing). Five Pillars covering Discovery, Preservation, Assessment, Workflow Integration, and Content Diversity support the Roof, which represents the ultimate goal: Institutional & Research Impact.

IV. BARRIERS TO IR EFFECTIVENESS AND LESSONS FROM RECENT STUDIES

Despite their strategic importance, Institutional Repositories (IRs) frequently encounter systemic barriers that limit their reach and impact. Recent empirical studies and comparative analyses consistently identify four interconnected challenges, alongside evidence-based strategies to overcome them. A primary obstacle is chronically low author engagement. In the absence of mandates or tangible incentives, faculty self-archiving rates remain low. Studies by Chen et al. (2024) confirm that reliance on voluntary deposit is ineffective. The solution lies in proactive mediation: librarian-assisted deposit services, automated workflows that ingest publications from CRIS, and integration with promotion and tenure criteria have been shown to significantly increase participation.

A second critical barrier is deficient metadata and poor interoperability. Inconsistent or sparse metadata renders content

virtually invisible to global aggregators and search engines, negating the core function of an IR. Research from the CORE initiative (2023) demonstrates that aligning metadata with established guidelines (e.g., OpenAIRE) and consistently employing persistent identifiers (DOIs for items, ORCIDs for authors) dramatically improves discoverability and harvesting, yielding a high return on investment.

Many institutions, particularly smaller colleges, face severe resource constraints. Maintaining a sustainable IR requires dedicated staffing and technical expertise, which are often the first casualties of tight budgets. The emerging lesson, as documented in consortial studies from India and the Global South, is that shared services or consortial platforms can pool resources, reduce costs, and create a more robust technical infrastructure than any single institution could support alone. Finally, fragmented or absent open access policies create a governance vacuum. A study by the Science Communication Institute (2024) found that "policy misalignment" is a root cause of low compliance. Evidence indicates that institutions achieve far higher deposit rates when they implement clear, institution-wide OA mandates. These policies must be backed by technical support and integrated into research administration workflows to be effective.

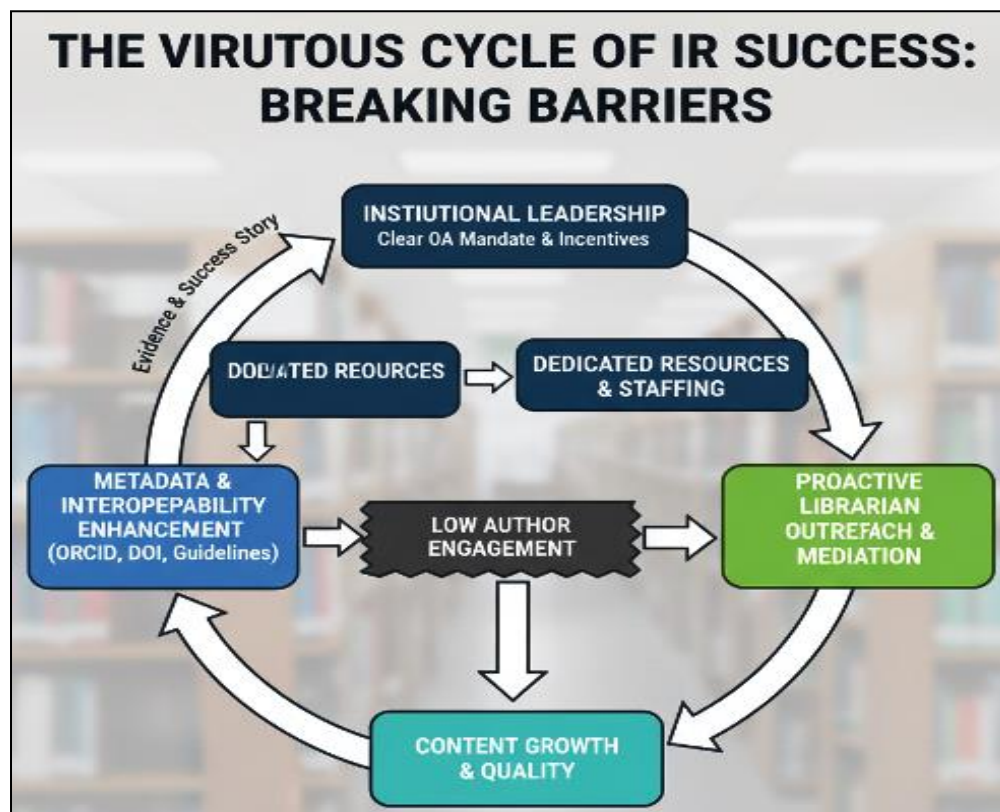


Fig 4: Virtuous Cycle of IR Success

Institutional Leadership with mandates secures Resources, which fund Interoperability and Librarian Outreach. These efforts overcome Low Author Engagement, leading to Content Growth. This success generates Evidence that feeds back to leadership, reinforcing the cycle and ensuring sustained support.

V. RECOMMENDATIONS: A PRAGMATIC ROADMAP FOR INSTITUTIONS

Based on a synthesis of global evidence and comparative studies, institutions can maximize the impact of their repositories by adopting a pragmatic, multi-stage roadmap. The following evidence-based recommendations provide a structured path from foundational policy to advanced open science practice.

- First, adopt an evidence-based Open Access policy. A clear mandate requiring deposit of accepted manuscripts, coupled with defined embargo rules and copyright guidance, is the most significant predictor of content growth. As confirmed by the Science Communication Institute (2024), such policies should be integrated into research evaluation frameworks while providing transparent opt-out pathways to ensure researcher buy-in.
- Second, prioritize user-centric deposit workflows. Seamless integration is key. This involves implementing single-sign-on, ORCID synchronization, and automated imports from CRIS or email alerts to minimize researcher effort. The

Iowa State Digital Press (2023) model demonstrates that offering a mediated deposit service as a parallel option is crucial for engaging time-pressed faculty.

- Third, strategically invest in metadata and interoperability. Adhering to community metadata profiles (e.g., OpenAIRE Guidelines) and assigning persistent identifiers (DOIs) are not technical details but essential investments. Registering the repository with major aggregators like BASE and CORE ensures global discoverability and amplifies research impact.
- Fourth, secure dedicated funding and staff expertise. Sustainable repositories require skilled personnel for outreach, quality control, and curation. Allocating seed grants for open dissemination incentivizes researchers, while consortial or shared service models, as successfully implemented in some Indian states, offer a viable solution for resource-constrained institutions.
- Fifth, leverage analytics to demonstrate value. Regularly publishing reports on downloads, geographical reach, and deposit growth translates repository activity into tangible benefits that resonate with both faculty and administrators, justifying ongoing investment.
- Finally, evolve towards supporting open scholarship by promoting the deposit and licensing of datasets, code, and educational resources in line with FAIR principles, thereby transforming the IR into a hub for the entire research lifecycle.

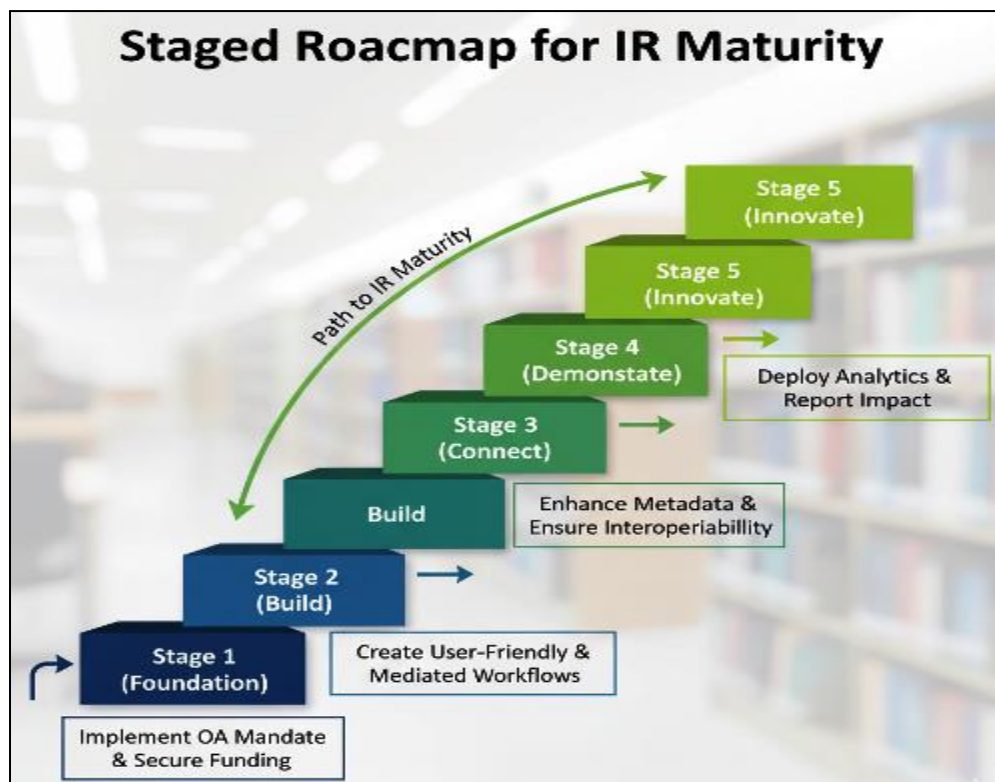


Fig 5: Staged Roadmap for IR Maturity

Fig5 It shows an ascending 5-Stage path: starting with Foundation (Policy/Funding) and Build (Workflows), moving to Connect (Interoperability) and Demonstrate (Analytics/Impact), and finally reaching Innovate (Open Science/FAIR Data) to achieve full Institutional Repository (IR) maturity.

VI. CONCLUSION

Institutional repositories represent a foundational pillar of the modern open science ecosystem. Their true potential is realized not when they function as isolated digital archives, but when they are strategically positioned and resourced as core research infrastructure. Evidence from leading international initiatives and empirical studies consistently demonstrates that the transformation of an IR from a passive repository into a dynamic engine of scholarly discovery hinges on a synergistic combination of key elements. This transformation is driven by the implementation of clear institutional open access policies that mandate deposit, providing the necessary framework for participation. This must be coupled with technically robust and user-friendly deposit workflows that minimize barriers for researchers, thereby encouraging consistent engagement. Furthermore, a commitment to high-quality metadata and interoperability standards is non-negotiable; it is this technical foundation that allows repository content to be seamlessly harvested by global aggregators, maximizing its visibility and impact. Finally, the ability to generate and share demonstrable analytics—tracking downloads, citations, and geographical reach provides the crucial feedback loop that proves the value of the repository to both administrators and researchers, justifying ongoing investment.

For institutions operating with limited resources, this model remains attainable through pragmatic adaptation. The path forward often lies in collaborative, cost-effective strategies such as participating in shared services or consortial platforms, which pool expertise and infrastructure. Complementing this, a focus on targeted researcher incentives and proactive, librarian-led mediation can drive content growth effectively, even without a large dedicated team. Ultimately, by embracing this integrated approach merging strategic policy, intuitive technology, and human-centric support universities can leverage their institutional repositories to not only expand open access but also to amplify the global reach and influence of their scholarly output.

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