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BRIN Library in the Age of AI and Open Science

Institutional Strategies, Librarian Skills, and Digital Infrastructure

The National Research and Innovation Agency (BRIN) is Indonesia's national research institution that must adapt its library role to the current era of artificial intelligence (AI) and open science. The BRIN library has successfully developed an institutional repository, though there is still considerable room for improvement. In the future, with this repository, the library hopes to serve as a research partner for BRIN researchers, data managers, and a hub for digital scholarships.

This shift reflects a broader trend in academic and research libraries worldwide. The rapid development of AI technology and the global movement toward open, accessible, and collaborative science are challenging libraries to evolve beyond their traditional book storage functions. For libraries in developing countries, there is an urgent need to adapt swiftly and bridge gaps in infrastructure, capacity, and policy while ensuring that local researchers remain connected to the international scientific community.[1] The experience of the BRIN library shows a case of how an institution navigates this complex transformation.

Institutional Strategies for a New Era

The BRIN library's transformation covers a rethinking of its institutional mission. The library has aligned itself with Indonesia's national research ecosystem and the Sustainable Development Goals (SDGs). This alignment is realized through concrete strategies, such as preserving research data, expanding collaborative networks, and ensuring equitable access to information. Alignment with the SDGs is a fundamental step in library transformation.[2]

Indonesia's research environment has undergone significant changes in the past decade. The establishment of BRIN in 2019 consolidated multiple research institutions under one umbrella, creating new opportunities and challenges. For the BRIN library, this reorganization required a clear vision: How could the library support national research priorities while also responding to global shifts in science and technology?

To answer this, the library embraced a digital-first approach. Initiatives such as building comprehensive digital collections, acquiring electronic resources, and experimenting with AI tools were prioritized. Importantly, the library adopted the research life cycle framework, recognizing that support for researchers must span the entire process—from idea generation and data collection to publication and long-term preservation.

By positioning itself as a digital research library, BRIN is also contributing to Indonesia's rising profile in the Global Innovation Index. While rankings alone do not capture the full

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picture, they indicate that the library's efforts are part of a broader national push toward innovation-driven development.

Another critical institutional strategy has been advocacy. BRIN library actively communicates its value to policymakers and funders, emphasizing its role in fostering open access, digital inclusion, and data-driven research. Such advocacy is essential in resource-constrained environments, where libraries must compete for attention and investment alongside other priorities.[3]

Building Librarian Skills

Technology alone cannot transform a library—people remain at the center of change. Recognizing this, BRIN library has invested heavily in developing the skills and competencies of its librarians.

The rapid rise of AI tools has generated both excitement and anxiety among library professionals worldwide. At BRIN, librarians are being trained to use tools such as ChatGPT, Scispace, Grammarly, iThenticate, and Catchii. These tools help them assist researchers in managing data, checking originality, refining academic writing, and conducting literature reviews.

But skill development goes beyond mastering software. BRIN librarians are encouraged to participate in workshops, webinars, and collaborative projects that enhance their understanding of research methodologies, bibliometrics, and knowledge management. By fostering peer-to-peer learning and knowledge sharing, the library is building a culture of continuous professional growth. Importantly, BRIN emphasizes that librarians are not passive service providers. Instead, they are seen as strategic partners in research. By collaborating directly with scientists, librarians contribute to shaping research agendas, improving publication quality, and ensuring compliance with open science mandates. This approach reframes librarians as agents of change. Rather than fearing displacement by technology, they are empowered to harness it in ways that expand their professional roles and strengthen the research ecosystem.

Digital Infrastructure for Research

Infrastructural readiness is another cornerstone of BRIN library's transformation. The library has prioritized investments that make services more accessible, secure, and impactful. One notable innovation is the introduction of twenty-four-hour online services. Researchers can now access collections, consult with librarians, and use digital tools at any time. This flexibility is particularly valuable in a country as geographically diverse as Indonesia, where researchers may be spread across multiple islands and time zones.

The library has also integrated AI-driven platforms to improve research productivity and quality. Subscriptions to tools like ChatGPT and iThenticate provide practical support for writing, originality checking, and data analysis. Tableau-based data visualization helps researchers interpret complex datasets and communicate findings more effectively.

Security is another priority. The BRIN library has strengthened its digital infrastructure by adopting secure repository systems and exploring the development of security operations centers. Such measures ensure that sensitive research data is preserved responsibly and remain accessible for future use.

Looking ahead, the library plans to implement Copilot applications for document management and expand training in systematic literature reviews and bibliometrics. These initiatives

demonstrate a commitment to staying ahead of technological trends while addressing the specific needs of BRIN's research community.

Moving toward Digital Scholarship

Among the BRIN library's most challenging projects is its digital scholarship (DS) program, currently in development. *Digital scholarship* refers to the integration of digital tools, methodologies, and platforms into research and scholarly communication.[4] For BRIN, DS represents both a challenge and an opportunity: how to create services that not only support research but also actively shape it. The program is closely tied to the research life cycle concept. By embedding library services into every stage of research—from data planning and collection to dissemination and preservation—the library seeks to become an indispensable partner in scholarly work.

A key component of this initiative is the National Scientific Repository (RIN). Managed by BRIN, RIN serves as a secure platform for storing and sharing research data. Researchers are encouraged to deposit datasets, particularly those from government-funded projects.[5] Over time, RIN could evolve into a national hub for open data, supporting transparency, reproducibility, and collaboration.

The digital scholarship program also reflects a broader cultural shift. Traditionally, libraries were viewed as service providers operating at the margins of research. Today, BRIN is reimagining its library as an active participant in knowledge production, one that contributes to shaping scholarly norms and practices in the digital age.

Challenges Ahead

Despite these advances, BRIN library faces significant challenges. One major issue is the need for institutional recognition. Although the digital scholarship program is promising, it has not yet been fully integrated into BRIN's official vision and mission. Without this recognition, it may be difficult to secure long-term funding, staffing, and infrastructure support.

Another challenge is sustainability. Implementing new technologies and training programs requires continuous investment. In developing countries, budgetary constraints can threaten the continuity of innovative initiatives. For BRIN library, maintaining momentum will depend on strong advocacy and strategic partnerships.

Finally, there is the challenge of cultural adaptation. Encouraging researchers to share data, adopt open science practices, and embrace AI tools requires more than infrastructure—it requires building trust, changing habits, and fostering a culture of openness. This cultural dimension may prove to be the most difficult yet most rewarding aspect of the transformation.

Lessons for Librarians Worldwide

While BRIN library's context is unique, its experience offers valuable lessons for librarians elsewhere. Three insights stand out:

1. Integration is key.
   Libraries cannot afford to treat AI, open science, or DS as separate initiatives. They must be integrated into institutional strategies, daily practices, and long-term visions.

2. People matter as much as technology.
   Investment in digital infrastructure must be matched by investment in human capacity. Librarians who are confident, skilled, and innovative can turn technology into meaningful services.
3. Advocacy ensures sustainability.
   In resource-limited environments, demonstrating the value of libraries to policymakers and funders is critical. Data on library impacts, compelling narratives, and evidence of contributions to national goals can secure the necessary support.

Conclusion

BRIN library's journey illustrates both the possibilities and complexities of reimagining a research library in the age of AI and open science. Through institutional strategies, capacity building, and technological innovation, the library has positioned itself as a forward-looking partner in Indonesia's research ecosystem.

Ensuring sustainability, embedding digital scholarship into institutional frameworks, and fostering a culture of openness will be ongoing challenges. For librarians worldwide, BRIN's experience serves as a reminder that libraries, regardless of context, must be adaptable, innovative, and proactive to remain relevant in a rapidly changing scholarly landscape. By embracing both the opportunities and the challenges of the digital age, BRIN library is not only supporting national research priorities but also contributing to the global conversation on the future of libraries.

Notes

1. Alan Hopkinson, "Library Automation in Developing Countries: The Last 25 Years," *Information Development* 25, no. 4 (2009): 304–12, doi: 10.1177/0266666909349678.

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4. Baiyang Li, Yaqian Song, Xinyu Lu, and Lihong Zhou, "Making the Digital Turn: Identifying the User Requirements of Digital Scholarship Services in University Libraries," *The Journal of Academic Librarianship* 46, no. 2 (2020): 102135, doi:10.1016/j.acalib.2020.102135.

5. Ambar Yoganingrum et al., "Strategies to Encourage Data Owners to Self-Archive Data Sets," Library Hi Tech News (2024), doi:10.1108/LHTN-03-2025-0044.