

From Research Data Management to Research Intelligence: Rethinking Research Infrastructure for Africa

Research Data Management (RDM) has become a cornerstone of modern research, providing the frameworks and infrastructure necessary to ensure that research data are collected, documented, stored, governed, shared, and preserved in accordance with best practices and the FAIR principles. These advances have significantly strengthened research integrity, reproducibility, and long-term data stewardship. However, despite these achievements, much of today's research ecosystem remains fragmented. Researchers continue to navigate multiple disconnected platforms for study design, data collection, statistical analysis, collaboration, scientific writing, publication, and data preservation, resulting in duplicated effort, workflow inefficiencies, and delayed translation of evidence into policy and practice.

We argue that the next evolution of research infrastructure should extend beyond Research Data Management towards Research Intelligence—a conceptual framework that integrates secure research infrastructure, advanced analytics, artificial intelligence, and collaborative digital workflows to support the entire research lifecycle. Research Intelligence is designed to augment human expertise by automating repetitive and administrative tasks while preserving scientific judgement, methodological rigour, transparency, and ethical oversight.

Using an integrated digital research platform as an illustrative case, we demonstrate how end-to-end research ecosystems can reduce fragmentation, improve efficiency, strengthen reproducibility, and accelerate the translation of research into policy and practice. We further discuss the opportunities such integrated infrastructure presents for African research institutions seeking to strengthen research capacity, foster interdisciplinary collaboration, and improve evidence-informed decision-making.

We conclude that while Research Data Management remains an essential foundation for responsible research, future research infrastructure should evolve to support not only the management of research data but also the generation of trustworthy knowledge and meaningful societal impact. We therefore propose Research Intelligence as a conceptual extension of Research Data Management that reflects the growing need for integrated, intelligent, and researcher-centred digital ecosystems capable of supporting the next generation of research across Africa.

Keywords: Research Data Management; Research Intelligence; Research Infrastructure; Artificial Intelligence; Digital Research Ecosystems; Africa.

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