

**Institutional Repositories:
Time for African universities to consolidate the digital divide**

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Current State of Research and Development in African Universities:

Access to scholarly information is the biggest problem in African Universities. The dearth of Research and Development programs in African universities, access barriers to high priced scholarly literature and lack of quality research infrastructures have dampened the research spirit in African Universities. The west-centred scholarly paradigm and the high costs of scholarly literature, such as journals and books, have kept the intellectual output of Africa under constant check. A close look at the costs of journals in major scientific fields will clearly portray the fact that access to a single journal in a particular field itself is very hard to obtain, while procuring enough scholarly information in that particular field remains highly impossible. For example an institutional subscription to a bundle of seven science journals including *Brain Research* is charged at US\$ 20,000, which is almost equivalent to a year's journal budget for most of the African libraries. With the current price structure of scholarly publications and the amount of scholarly literature published worldwide, even the wealthiest institutions cannot purchase access to all the information that their researchers require. Statistics show that during the 15 year period ending at 2001, journal prices rose by 215 percent, while during the same period most of the African libraries experienced steep decrease in their library budgets. Most of the African currencies also depreciated during this period resulting in higher currency exchange rate. The situation worsened to such an extent that projects such as "Protect the African Library"¹ had to be initiated to keep the African libraries alive.

The technological divide further aggravated the research capabilities of African universities. The fundamental principle of research is that wide dissemination of research results is vital for validating these results and advancing the field of knowledge. Unfortunately in African universities dissemination of one's research findings is also a

¹ <http://www.acu.ac.uk/lowcostjournals/>

major concern mainly because of publishing and access inabilities. Most scholars who follow the “publish or perish” motto, mainly because of their academic professional advancement, try to publish their research findings in a well circulated and highly reputed periodical. Because of this rush to publish in highly reputed core journals, most of the African scholarship is either unpublished or delayed. Apart from the research, the visibility of African scholarship is also kept to the minimum, mainly because of these access and publishing inabilities. All these handicaps contribute to the minimal research activities in African universities. These problems are not unique to Africa alone, for, the scholarly publishing industry with its monopoly and elitist system of journals and publishers have created a world of “intellectual haves and have-nots”.

Institutional Repositories - Genesis:

The disappointment and inability created by the closed access to scholarly literature and the anomalies in journal publishing paradigm in the areas of pricing, access, copyright and host of other monopolies, paved way for Open Access Initiatives. The core essence of Open Access Initiatives is to “make research articles in all academic fields freely available on the internet”.² Notable among these initiatives are the working models of Open Access Journals and Institutional Repositories. These initiatives were directed to rescue the obliterated research world with the sole aim to provide a complimentary role by reforming the current scholarly communication impasse and to re-assert control over scholarship by the academia and to provide increased and uniform visibility of its researchers. While the Open Access Journal models were experimented in the publisher and organizational level, Institutional Repositories were experimented by the Educational Institutions and more notably the universities. Universities with its numerous intellectual activities in its scientific and scholarly arena, and the most affected party in the closed and profit oriented publishing scenario, grabbed this opportunity to build the Repositories and eventually succeeded in its endeavour. With the mandate to bring together and preserve the intellectual output of individual institutions, many universities came forward to experiment this new flame.

² <http://www.soros.org/openaccess/>

In these experiments, unlike the traditional expectations of resistance from the publishing monopolies, the strong resistance came from within the institution's faculties, mainly because of its inexperience with the open archiving and open access concepts and the further copyright commitments with the publishers. While the academia feared over the uncertainty of intellectual theft, the administrators feared the exposure of their institution's intellectual scarcity. With its initial resistance from the conservatives, slowly the academia learnt the benefits of Open Access and many came forward to publish their works in their institution's servers. This marked the significant success of the Institutional Repository model of scholarly publishing towards creating a world of free and open access scholarly society. As of today there are hundreds of Institutional Repositories scattered all over the world. University of Michigan's metadata harvester, OAIster,³ provides an enviable list of close to 700 institutions which provide close to a million scholarly articles from their repositories.

Institutional Repositories - An Introduction:

Institutional Repositories are broadly described as the "collection of digital material hosted, owned and controlled or disseminated by an institution". More specifically Institutional Repositories are the "digital archives of the intellectual product created by the faculty, research staff and students of an institution and accessible to end-users both within and outside of the institution". The important function of the institutional repository is to capture and preserve the original research and other intellectual property generated by an institution while disseminating the content open and interoperable, keeping the content cumulative and perpetual and at the same time preserve and make accessible those digital contents on a long-term basis. At the most fundamental level the Institutional Repositories are envisaged to collate the intellectual life and scholarship of an institution with the primary commitment to preserve them for distribution and dissemination on a long-term basis.

The immediate benefit of the Institutional Repository is that all the research outputs which are collected and stored in its repository are unconditionally made available to its

³ See: <http://oaister.umdl.umich.edu/o/oaister/>

faculty and to all other members who are associated with it. Apart from easy and open access to scholarly information, for universities the repositories are good marketing tools to communicate the capabilities and quality of that institution by showcasing the faculty and student research and other intellectual activities of the institution. Institutional Repositories are good indicators of an institution's collective intellectual capital because it collects, preserves and disseminates the entire institution's intellectual output. As Rick Johnson, SPARC's enterprise director, observes "Institutional Repositories are a practical, cost-effective, and strategic means for institutions to build partnerships with their faculty to advance scholarly communication".

It's a common misconception amongst authors and administrators that the advent of Institutional Repositories around the globe has undermined the current system of scholarly journal publishing. Raym Crow observes that "Institutional Repositories will not and cannot, by themselves, eliminate the roles currently served by scholarly publishers, nor should they aspire to do so". On the other hand "institutional repositories provide a critical component in an alternative system of scholarly communication and publishing that delivers considerable benefits for the practice and economics of scholarly communication". One should bear in mind that the Open Access publishing tries to address not only the cost issue but also the barriers that the traditional subscription model impose between reader and research. Thus institutional repositories are recognised as complements to, rather than replacements for, traditional journals.

Institutional Repositories and African Institutions:

With the current status of Scholarly communication in general and the African Research status in particular and the advantages of Institutional Repositories the need to establish such repositories in African Universities is highly essential. The advantages and success of Institutional Repositories around the globe clearly ignites the case for initiating such repositories in African Institutions also. With access and availability of scholarly information on the downside and with the visibility of African scholarship also too low, it becomes imperative that the institutional repositories are the only possible remedies for these institutions. The main role of these repositories will be to collect all the intellectual

outputs of each institution and publish them in their respective servers and preserve them for long-term usage and dissemination. There is no doubt that with Africa being a vast and diversified land, with promises of high research potential, it will certainly gain in leaps and bounds once the research outlets are opened through the initiations of these institutional repositories.

Once institutional repositories are established in each institution the next step is to form a network of these repositories across the continent which will further enhance the academic and research capabilities of the continent. With the number of repositories inter-connected in gathering, evaluating, enriching, utilizing, sharing and disseminating scholarly communication there is no doubt that the research and development capabilities of African universities will gain momentum. Such a consortium of repositories will not only serve for better research capabilities, it will also open the visibility of African scholarship to global level and stand as a suitable response to the existing digital divide.

Network of Institutional Repositories – Benefits:

Once a network of Institutional Repositories in African Academic Institutions is established it will pave way for better access to quality scholarly literature which will become freely available because of the open access mode of these repositories. Another major benefit will be the reduction of time and cost in acquiring scholarly material for the researchers because of the local availability of the content. Hence a network of repositories will not only provide scholarly literature, but will provide the same at a lesser cost which will be a major boost for the cash-strapped African libraries.

A consortium of repositories will also result in the increase of research and teaching tools for African researchers and lecturers. With every institution publishing its intellectual output into their respective repository servers the chances of duplication in research in a specific field among the institution and across the continent will become less. At the same time research in a particular field in different geographical, ethnical, cultural and intellectual environment will also become a possibility. All these different dimensions to

research will result in the increase of research output which will eventually result in quality research and development projects in Africa.

Another major benefit of such a consortium of repositories will be the visibility of African scholarship as a whole and the visibility of each and every individual institution's intellectual output in particular. Current closed access publishing models doesn't' portray the quality and quantity of research done in African universities and by African scholars. The visibility and integrity of each institution will be determined by the work reflected in their repositories hence a network of repositories will not only produce qualitative research work, it will produce in quantity because the prestige of each institution will be at stake in terms of quality and numbers.

Network of Institutional Repositories - Key Issues to consider:

There are a number of key issues to be addressed in forming the network of Institutional Repositories. The key issues range from scope of such a project with issues of rules, the access and accessibility criteria, the policies and procedures and so on. But the foremost issue to be addressed is the establishment of these repositories. There is a need to sensitize each and every institution to acknowledge the need to establish its own repository. Universities with its defined academic structure and library as its light house of information, it becomes imperative that the focal point of such a repository shifts to the university library of each and every institution. The institutional repositories can flourish smoothly in terms of collecting and disseminating information, and in terms of utilising them, once this structure is observed. Once such structure is formed it becomes essential that the scope of the participants with their roles for gathering, evaluating, enriching, utilizing and disseminating information are spelt out clearly.

Once the basic infrastructure is formed then the standards are to be derived. The open access initiatives which fuelled the idea of free and unrestricted access to the scholarly literature, comply with the Open Archiving standards⁴. The Open Archiving Initiatives have developed a set of inter-operability standards called the Open Access Initiatives

⁴ See: <http://www.openarchives.org>

Protocol for Metadata Harvesting (OAI-PMH), which allows the open access initiatives to create metadata and store them in their respective servers so as to enable others to access them. The idea behind the OAI-PMH standards is to provide comprehensive metadata harvesting from a single focal point. It becomes essential for a consortium of inter-connected repositories to follow these standards. The OAI protocol requires that the open access initiatives follow and offer the basic 15 core metadata elements defined in the Dublin Core⁵ metadata scheme. Following these standards will make sure that uniformity is maintained in the consortium and at the same time searching and harvesting the metadata becomes smooth.

From Standardization the next key factor to consider is the access levels, for, the repositories spill from the boundaries of the institution to the entire nation and further cross the boundaries of the nation in to the entire continent and to the whole world. With a number of such universities playing part in the consortium it becomes inevitable to define the access and control strategies. Access and control strategies are to be carefully looked into, because sometimes it will touch into the copyright related legal exponentials also. Sometimes there may be legal implications of using culturally and heritage important material in the repositories. If there are limits on disseminating sensitive, selective and highly important material then, either new ways to limit or safeguard integrities of such material, or software solutions are to be formulated. Keeping different groups of people who will be working and using the repository even access levels and group restrictions need to be addressed.

Another important issue to be addressed is the sustainability of the repositories, for, the success of the consortium of repositories depends mainly on the survival of these repositories. By bringing these repositories into the academic institutional mainstream, these repositories will get its due recognition and life. Sustainability also refers to long term preservation, where digital archiving should be made mandatory in each repository. Long term preservation depends on adapting to changing technologies and acclimatizing to those new technologies. Above all the real threat for these repositories will come in the form of contributions. Unless it is made mandatory that every published article from an

⁵ See: <http://dublincore.org/documents/usageguide>

institution is made available in these repositories the collection development will be a major setback. A basic reward based publishing setup interlinked with academic advancement programs will ensure that the scholarly publications are duly submitted to the institutional repositories.

Institutional Repositories – The Future:

With the latest developments around the globe there seems to be more awareness especially in areas of open access and open content. The recent UK House of Commons, Science and Technology Committee report⁶ urges the government to allocate funds to each and every university to start institutional repositories and ensure long term preservation of digital scholarship emanating from these digital repositories. The U.S. House of Representatives Committee on Appropriations followed suit with the recommendation of all NIH funded research to be archived in PubMed Central, 6 months after publication⁷. Recently in June 2006, the Research Council of UK (RCUK) issued the long awaited open access policy directing all its research to be published in Open Access⁸. The Federal Research Public Access Act of 2006 in the US Senate⁹ is yet another milestone in the Open Access to Research literature. Similar proposals are being discussed in various other countries like Canada, Scotland, Australia, Norway and India. Such strong commitments from our African counterparts will certainly go a long way in creating and maintaining the Institutional Repositories in African universities. With these developments there is no doubt that the scholarly communications are poised for an exciting future. The increasing awareness among the authors and researchers is a very good sign for the future of scholarly publications. If Africa can follow suit and try to emulate their peers and governments, it will go a long way in establishing an intellectual network of scholarly information sources, which will certainly fuel the intellectual renaissance in Africa Universities. This will go a long way in consolidating the existing digital divide.

⁶ See: <http://www.publications.parliament.uk/pa/cm200304/cmselect/cmsctech/399/399.pdf>

⁷ See: <http://www.arl.org/info/publicaccess/index.html>

⁸ See: <http://www.rcuk.ac.uk/access/index.asp>

⁹ See: <http://cornyn.senate.gov/index.asp?f=record&lid=1&rid=237171>