Université Cheikh Anta Diop de Dakar

IFAN Ch. A. Diop

Semaine de l'Open Access à l'UCAD

Title of the presentation: ***CHALLENGES OF BUILDING DIGITAL REPOSITORIES IN AFRICA***

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Outline

- Contexte et justification du libre accès
- Eléments de définition
- Les différents modèles de libre accès
- Open Access Support
- Quels enjeux pour la recherche en Afrique?

Contexte et justification du libre accès

- **Context and justification of Open access**
- Formerly vehicled by the Church and private circles, knowledge was selfishly guarded in traditional areas and the first French journal of scholarly status, "*Journal des Sçavans*" is said to appear at Paris in 1665 and its british equivalent, "*The Philosophical transactions of the Royal Society*" in the same date.
- With the development of printing, access to knowledge was democratized and there was an explosion of new subjects and ever increasing need of specialists to evaluate scholarly works. This obliged publishing committees to settle peer-review system as a standard to control the quality of scholarly publications.
- "Journal des Sçavans" http://www.goubik.info/sciences/spip.php?article165
- The Philosophical Transactions of the Royal Society
- http://fr.wikipedia.org/wiki/Philosophical_Transactions_of_the_Royal_Society

Contexte et justification du libre accès

- The cost induced by articles published in printed format by big specialized publishers, particularly in Science, Technology and Medicine and more recently allowing subscription to their equivalent electronic format created price crisis and a monopoly. This situation make inflation rise in such a state that the wealthiest academic institutions can no longer afford to continue subscriptions for their libraries, because reviews prices from big publishers like Elsevier, Blackwell and Springer encumber their budget while reducing drastically their catalogue.
- A political and ideological lobbying against excessive profit making by publishers was engaged, justified by the principle that the funding of research is generally public, then supported by tax-payers. Alternative solutions begin to emerge to break the restrictive dualism identifying scholarly elitism exclusively to financial elitism

Contexte et justification du libre accès

- The tremendous explosion of scientific publications these last twenty years has given birth to the emergence of alternative solutions based on open and free access to information. Welcomed as a new breath in libraries, and backed by international organizations, the private sector, academic institutions, libraries, researchers and professional associations, open access initiatives are then turned into a worldwide militantism with declarations of intent and actual facts.

Eléments de définition

- **Libre Accès**

"L'accès libre est la mise à disposition gratuite sur l'Internet public, permettant à tout un chacun de lire, télécharger, copier, transmettre, imprimer, chercher ou faire un lien vers le texte intégral de ces articles, les disséquer pour les indexer, s'en servir de données pour un logiciel, ou s'en servir à toute autre fin légale, sans barrière financière, légale ou technique autre que celles indissociables de l'accès et l'utilisation d'Internet. La seule contrainte sur la reproduction et la distribution, et le seul rôle du copyright dans ce domaine devrait être de garantir aux auteurs un contrôle sur l'intégrité de leurs travaux et le droit à être correctement reconnus et cités." (Initiative de Budapest pour l'Accès Ouvert (2001)

Eléments de définition

- Pour lever tout équivoque le terme anglais « open access » est plus utilisé à la place de « free access » qui ne signifie pas « accès gratuit ». Le qualificatif « Open » traduit plutôt une philosophie, une volonté manifeste de libérer l information des barrières infrastructurelles et techniques basées avec le développement d outils « Open Source » par opposition aux programmes propriétaires.
- Etant donné que les barrières financières ne sont pas les seules contraintes limitant l’ accès a l information, dans le cas ou l information était libre et gratuite, les principes d éthique et de justice protégerait l’ auteur d'attaques mal intentionnées et diffamatoires par une mauvaise utilisation de l information

Eléments de définition

Référentiel terminologique à maitriser (liste non exhaustive)

- Termes juridiques :Droit d'Auteur, Copyright, Copyleft, Creative Commons, Embargo (barrière mobile)
- Evaluation par les pairs (Validation scientifique) : Peer Review, Impact Factor
- Archive ouverte, Archive disciplinaire, Archive institutionnelle (Institutional Repository
- Serveur OAI, Data Provider, Service Provider, Métadonnées Dublin Core, Protocole OAI-PMH, Format XML

Les différents modèles de l Open access

- In addition to strong international lobbying and protest, alternative solutions emerge. Among them: eBooks, digital libraries, and community virtual space for knowledge sharing: blogs, wikis, video and audio podcasts, discussion forums, social networks of scientists, etc.
- Even if the primary concern of OA is access to journal articles, concern for safeguarding and valorizing the scholarly production of academic institutions through self-archiving in institutional repositories become another challenge. OA therefore distinguishes two major contents: OA journals called “gold OA” and OA repositories, referred to as “green OA”.

Les différents modèles de l Open access

- **OA journals or "gold OA"** (OA Publishing ou revues alternatives)
- "The Author pays"
- Advocating the principle of free access to knowledge but caring also for quality papers, OA journals use standards like subscription-based journals, among which peer-review. Huge investments are then made to remove the false idea identifying free OA articles with poor quality. In this respect, the most successful achievements are Plos (Public Library of Science), BMC (Biomed Central) providing free access to peer-reviewed and valuable scientific contents in Physics, Chemistry, Medicine, Biology, etc.
- OA journals do really induce production costs even if they are lower than subscription-based journals providing articles in electronic and /or printed format. To enable free access, publications fees are generally supported by the author's sponsor: his university, research institute, funding agency, etc.

Les différents modèles de l Open access

- **OA Repositories or ”green OA”**
- This OA content production system is based on self-archiving for safeguarding and also enabling online free access. Entertained by a group of scholarly interest (i.e. scientific community per discipline) and academic institutions (universities, laboratories, faculties, etc,), its contents include preprints, postprints, thesis, dissertations, reports, and many other valuable scientific materials in various format : textual, iconographic, audiovisual, multimedia, sound records, etc.
- The cost of implementing and sustaining OA repositories are supported by institutions themselves or funders. They run policies to organize access with authors, and publishers if the permission of these ones is required to transfer copyright. A literature review shows that some non-OA publishers support OA initiatives and that there are various experiences in building OA repositories. Policies depend on the actors of the discipline, the academic institution hosting the repository, copyright law, the culture, achievements, and impact of OA in the national and regional scholarly area.

Open Access Support

Political and ideological support

The control of scholarly publications market by big publishers, imposing their titles in package and not enabling libraries to make savings for other acquisitions has become a professional reality worldwide. This threat for the development of knowledge accelerates international protest and causes a stir strengthened by political and ideological backing:

Advocacy and lobbying at an international level

Dependent on the progress made in ICT, the market of scholarly publications, research needs and new challenges, a variety of projects in support of OA emerge. This creates mutations leading to the implementation of policies to reorganize investments in information access and retrieval and the valorization of research outputs. Therefore, many organizations caring for the freedom of access to information and the future of research rise their voices through strong statements to support OA: Declarations of IFLA (Berlin Open Access), OCDE, UNESCO, etc.

Open Access Support

- **Advocacy and lobbying at an international level**

- **Europeana** :The catalyst for Europeana was a letter sent by Jacques Chirac, President of France, together with the premiers of Germany, Spain, Italy, Poland and Hungary to the President of the European Commission, José Manuel Durão Barroso, in April 2005. The letter recommended the creation of a virtual European library, to make Europe's cultural heritage accessible for all. Europeana gives access to different types of content from different types of heritage institutions. The digital objects that users can find in Europeana are not stored on a central computer, but remain with the cultural institution and are hosted on their networks. Europeana collects contextual information – or metadata – about the items, including a small picture. Users search this contextual information.
- Once they find what they are looking for, if they want to access the full content of the item, they can click through to the original site that holds the content.

Open Access Support

- **Commitment at a national level**

- In many countries, public policies militating in favor of OA become famous with concrete results. Among them the CCDS (Centre pour la Communication Scientifique Directe) of the CNRS in France, with its successful multidisciplinary server (HAL), providing free access to scholarly contents from the main French academic institutions. Ceci a été possible grâce à la signature d'un Protocole d'Accord Inter-établissement, pour la mise en place d'une plateforme commune de dépôt d'écrits scientifiques associant l'ensemble des universités françaises, des grandes écoles et d'organismes de recherche : CEMAGREF, CIRAD, CNRS, INRA, INRIA, INSERM, l'Institut Pasteur et l'IRD
- The RCUK ("Research Council") in The United Kingdom, where OA debate was brought to Parliament in 2004.

Open Access Support

Economic support

- Despite international plea of OA activists for boycotting excessive subscription prices of big publishers, the market of scientific information is still lucrative. They continue to monopolize the production of famous traditional journals, particularly in Science, Technology and Medicine like *Science*, *Nature*, etc.
- The alternative consists of implementing an OA scholarly publishing based on a peer-reviewed system. To support financially this model, it is the "author who pays". Either he pays himself per article to be published, either his university, research institute or funding agency pays on behalf of him. Because, to make the reader access freely to articles, funds should be raised upfront to pay reviewers, to publish and always maintain technological infrastructure.

Open Access Support

Juridical support

- Achievements to improve scholarly communication would not be really useful without copyright policies placing the author in the centre of the system. Even if legislations differ from one country to another, an open-minded view towards copyright law created a dynamic and such a solidarity that **actors agree to focus no longer on patrimonial right, but to the author's authorization, permission to make his work accessed and used freely.** In proposing OA peer-reviewed journals and institutional repositories, actors implement simultaneously alternative juridical solutions to impede copyright law restrictions upon scholarly contents.
- To accelerate the process of research production and knowledge sharing, there was an **international commitment, since 2002,** through BOAI, Bethesda and Berlin statements. They define the characteristics of an OA content and the permission of the user to "copy, use, distribute, transmit and display the work publicly and to make and distribute derivative works, in any digital medium for any responsible purpose, subject to proper attribution of authorship…" (Bethesda Declaration on Open Access http://www.earlham.edu/~peters/fos/bethesda.htm)

Open Access Support

- **Juridical support**
- Then, to organize access to OA scholarly content, protect the ownership of the author, and the use of his work for research and education purpose, **Creative Commons** was created in 2002.
- It is a license focusing on permission barriers for users in informing them what they are allowed to do and not to do with contents. Then authors willing to publish their work in an OA system understand they must be the copyright holder. In doing this, they gain total freedom to release their work in a volunteering manner without worrying about infringement. The concern being in trust, and larger audience using their work, then the rise of citations impact and visibility.

Open Access Support

Juridical Support

- Among the most **famous OA scholarly journals,** Plos (Public library of Science), specialized in Biology, Medicine, Genetics, Tropical Diseases, etc., the author pays per article to be published.
- Another model, advocated by the Washington DC Declaration, enables to release recent articles and archives only after an **“embargo period”** negotiated with the publisher and lasting from 6 months to 2 years.
- In removing access barriers and making OA scholarly contents costless to the reader, actors (authors, academic institutions and funding agencies) accept to bear the costs.
- Washington D.C. Principles for Free Access to Science : http://www.dcprinciples.org/statement.pdf

Open Access Support

Scientific and technical support

- OA movement would not be successful and evolutive without **emblematic figures** who are the precursors and continue to develop a fertile scientific and technical production to sustain its achievements. The most famous by their vital contribution:
- **Richard Stallman**, the founder of the free software and President of the FSF (Free Sofware Foundation). Based on an ethical view, his work "*Why software should not have owners*" is a reference.
- **Peter Suber**, a big specialist, whose work "*A Very Brief Introduction to Open Access*" is available in a dozen of languages. In addition, his "*Open Access Overview*" (focusing in open access peer-review articles) dives into details in explaining all issues related to the implementation of an OA journal.
- **Eric Raymond**, co-author of the concept "*open source*" and founder of the *Open Source Initiative*. His great interest in open source softwares and concern for the future of the computer industry are explained in his book "*The Cathedral and the Bazaar*".

- Stallman, Richard. Why software should not have owners http://www.gnu.org/philosophy/why-free.en.html
- Suber, Peter. A Very Brief Introduction to Open Accesshttp://www.earlham.edu/~peters/fos/brief.htm
- Suber, Peter. Open Access Overview. Focusing on open access to peer-reviewed research articles and their preprints http://www.earlham.edu/~peters/fos/overview.htm
- Raymond, Eric S. The Cathedral and the Bazaar http://www.catb.org/~esr/writings/cathedral-bazaar/cathedral-bazaar/

Open Access Support

Scientific and technical support

- **Jean Claude Guédon,** another fertile contributor to OA movement by his writings. Among the most famous "*In Oldenburg's Long Shadow: Librarians, Research Scientits, Publishers, and the Control of Scientific Publishing*".(http://www.arl.org/resources/pubs/mmproceedings/138guedon.shtml)
- In addition to **key scientific production from great figures,** there are **technical achievements** in the task of creating a scientific common regarding OA literature.
- The **DOAJ** (Directory of Open Access Journals) which provides a list of OA journals in all fields and many languages;
- The **DOAR** (Directory of Open Access Repositories) which is a showcase of repositories providing OA contents throughout the world;
- Web sites, like **SPARC** (Scholarly Publishing and Academic Resource Coalition) which provides new developments of OA through papers, discussions and position of actors.

Open Access Support

- **Scientific and technical support**
- To build an OA system enabling access and retrieval of information while being able to communicate, send request and retrieve information from other OA content providers (i.e. OA institutional repositories, OA journals) **technical tools based on open source applications** have been devised. Like "**eprints**", the first and most famous open source software to implement an OA system provider, and also **Dspace.**
- But, to make OA servers operate on a common technical basis, there was a need to settle standards to manage the web contents of repositories. In this respect, basic technical standards in support of OA movement were developed:

Open Access Support

- **Scientific and technical support**
- **The OAI-PMH** (Open Archives Initiative Protocol for Metadata Harvesting), which is a mechanism for a data provider (i.e. an OA repository) to display structured metadata.
- This technical protocol serves two purposes. It enables, on one hand, a service provider to send request, by mean of a harvester, to a data provider in order to obtain metadata and value-added services. On the other hand, it enables **interoperability.** It means the fact of making OA servers communicate and exchange through tools that are able to go around repositories and harvest contents wherever they are located.

Open Access Support

- **Scientific and technical support**
- **The Dublin Core Metadata,** which is chosen as a simple and common metadata format to facilitate and standardize the harvest of service providers. It was over simplified and reduced to its fifteen elements or "unqualified Dublin Core" as a minimum basis.
- **XML format:** the OAI-PMH operates with XML, as a standard format.

Open Access Support

- **Pour résumer**
- Considered as a big revolution in scholarly communication, open access is defined as the free availability in Internet of scientific contents. An emblematic figure of open access, Peter Suber, describes it in these terms: "*Open access (OA) literature is digital, online, free of charge, and free of most copyright and licensing restrictions. OA removes price barriers (subscriptions, licensing fees, pay-per-view fees) and permission barriers (most copyright and licensing restrictions).*"
- Suber, Peter. A Very Brief Introduction to Open Access
- http://www.earlham.edu/~peters/fos/brief.htm

Information Dissemination /Sharing

- The development of ICT has settled a digital environment and enabled a so current social use and management of digital information that automation of library activities have become compulsory.

- Libraries and the homogeneous notion of collections are now delocalized and dematerialized, and the link between the content of a document and its support disrupted.

- Consequently digitization brings solutions to the limits of printed documents, in providing endless copies and an instant and broad sharing through networks. Works that would be unknown, particularly orphan works and those in the public domain, usually shelved in libraries as treasures, can now be safeguarded for the posterity and released for the benefit of pedagogy and research worldwide.

Information Dissemination /Sharing

- Digitization then serves the concept "***Education for All***" by increasing opportunities of learning and training, and therefore impacting positively on the quality of educational practices by reducing socio-economic barriers to information access;

- When they are applied to learning, building digital libraries, can contribute to maintain sustainability in developing capacities with regard to local challenges. In this respect, new trends in African universities are to settle Elearning training programs (i.e. Professional Master Degrees) to cope with shortage of expertise in key economic and technological sectors.

- In this respect, providing digital content is no longer a choice, but an obligation for libraries to perform their mission in meeting the user's need in an innovative and endless moving digital context.

The impact of African digital libraries on research and sustainable development

Impact on the dissemination of information

- African libraries deal with real hardships to survive : crucial problems related to shortages in financial means to run adequate policies regarding their collections from acquisition to delivery, generally the smallest percentage of the budget in their institution and sometimes, no budget at all.
- But it is obvious that the inexistence of substantial financial means does not prevent African libraries from struggling to build new capacities and be creative in front of the scarceness of resources
- They are taking advantages of the opportunities of digitization and open source tools to position themselves. Open source tools enable them to display their catalogue online, use social media, implement virtual libraries in compiling selective up-to-date open access contents per discipline, and direct researchers towards open access journals. They also enable them to build institutional repositories.

Impact on the dissemination of information

- Libraries should therefore encourage digitization programs and the current use and appropriation of digital content within their scholarly and professional environment. And at a wider scale, in the global contents production system, be key actors and build new abilities, both theoretical and practical, to survive professionally.

Impact on research

- Very few researchers in low-income countries can follow current subscriptions to research journals because for-profit journal publishers barred access to key scientific information, except for those who can afford to pay.

- Tough, there is a **big social disproportion between the North and the South**, and at a regional level, achievements of many digitization projects in Africa demonstrate that, with a strong political will, financial backing and managerial abilities, it is possible for the continent to contribute efficiently to the construction of a better world.

Impact on research

- Many initiatives in support to researchers from the South are of paramount importance. In this respect, The World Health Organization and the World Organization for Food and Agriculture, in partnership with publishers decide to provide free access to research outputs for developing countries through programs like HINARI, AGORA and OARE. This is also of measurable impact, because according to the 2010 UNESCO World Report,"… the developing world's share of articles in science, medicine and engineering rose from 30 % in 2002 to 38% in 2010." **(UNESCO Science Report 2010)**

- But, however valuable scholarly contents coming from the North may be, the challenges of African digital libraries are most significant with research performed in the continent. The historical, cultural and socio-economic context in which the African researcher is immersed endows him with other abilities to address local problems successfully.

Impact on research

- Even if Africa is poorly represented in the world scientific community, all is not bleak in the continent. In new trends related to information access, librarians and researchers are conscious they should develop capacities to adapt to innovative changes;

- But, however valuable scholarly contents coming from the North may be, **the challenges of African digital libraries are most significant with research performed in the continent**, because the historical, cultural and socio-economic context in which the African researcher is immersed endows him with other abilities to address local problems successfully.

Impact on research

- The greatest challenge is that the latent demand for research information and the unexplored potential offer of the rich African scholarly capital in terms of contents and expertise could be met :
- Training librarians in self-archiving to develop digital repositories;
- persuading African researchers to give instant worldwide visibility to their work;
- training them to the use and appropriation of open source tools and standards in order to build progressively, through collaboration, an authentic African scientific common.
- Backing from decisions-makers and substantial investments from governments and funding agencies, targeted to build and sustain local capacities in science and technology in all sectors are vital.

Impact on sustainable development

- Generally based on free and open source software, and using Internet as a powerful technology to share knowledge instantly worldwide, digital repositories are not so expensive to build and sustain :
- information access being most crucial in developing countries, providing online access to African scholarly contents can narrow the gap of ”knowledge divide”;
- making Science and Technology research outputs freely available, especially in the African context ensure a measurable quality-based and value-added sustainable well-being;

Impact on sustainable development

- empowering universities to provide more knowledge and knowhow and libraries facilitate information access and sharing,

- advocating towards African decision-makers to equip them with an adequate technological environment and enable them to build managerial abilities in ICT, will contribute to a better collaboration between research, industry, business communities, and other informal sectors developing innovative activities to fight against poverty.

Impact on sustainable development

- The unprecedented opportunities in knowledge dissemination, nourished and entertained by awareness regarding the wealth symbolized by the African scholarly heritage, vehicled and sustained by open source technical support, are hopeful for the continent.
- they accelerate the endless process of knowledge production, transfer, dissemination and use, in a moving educational context where eLearning has proven almost compulsory.

Conclusion

- Les différentes alternatives au système figé et généralement discriminatoire du monde de la publication scientifique, comme le développement des logiciels libres et des dépôts institutionnels ont quand même réussi à fonder la Société de l'Information sur des principes d'égalité.
- En s'imposant par des innovations difficilement maîtrisables, aussi performantes les une que les autres, ces modèles de communication soutenus par les formats ouverts n'ont pas fini de convaincre d'investir ce créneau, surtout par les pays en développement.
- Les Technologies de l'Information et de la Communication n'étant pas une fin, mais uniquement un moyen, on parle désormais "Content Divide" , de fracture au niveau des connaissances et de moins en moins de fracture numérique.
- En effet, l'enjeu se situe sur des investissements à long terme à l'endroit de systèmes éducatifs performants pour faire de l'utilisation de l'Informatique un usage social courant et les outils techniques et logiciels libres, des instruments de travail au service de la performance et de la créativité.

Merci de votre attention