REPRESENTATION AND INCLUSION IN OPEN SCIENCE: WORKING TOWARDS A GLOBAL DIGITAL COMMONS

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DANS

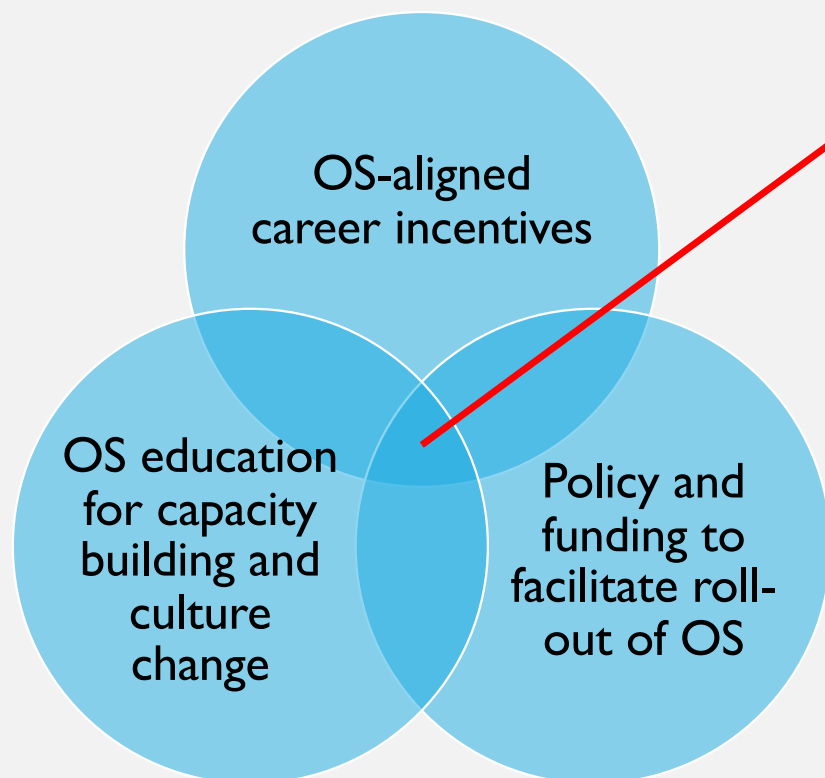Cotonou, 26 October 2022

OPENNESS IN RESEARCH

- Open Science/Research (OS) is changing the way that research is being conducted
- OS is commonly defined as a movement aiming to enable:
- *The products of scientific research to be <u>freely</u> available to everyone to use and republish as they wish, without restrictions from copyright, patents or other mechanisms of control*

- Characterised by
    - New ways of doing (ie. FAIR data standards)
    - New technological, disciplinary and social interconnectedness
    - New ways of framing responsibility, transparency and reproducibility

- Cultural as well as technical/practical movement
    - Change in community values and priorities recognized as key
    - Much of the work in OS continues to be done by volunteers – requires commitment to OS values
    - Compliance with policy, endorsement of infrastructures and changes in work practices requires research to *see value* in the openness
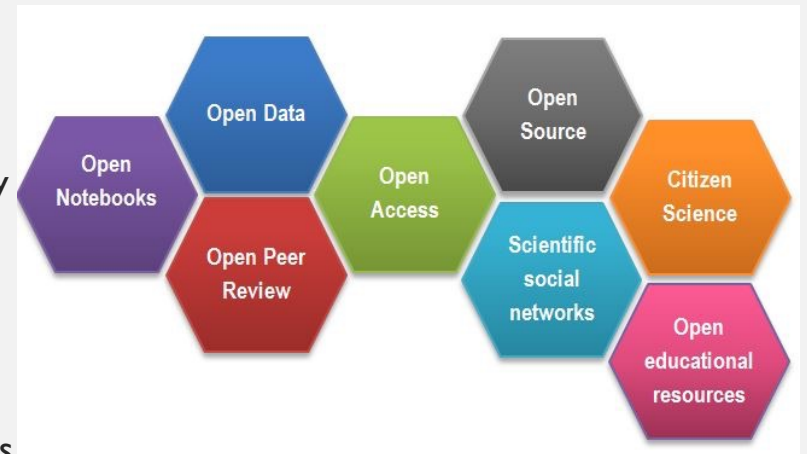
AIMING FOR GLOBAL OS

- Changing community values requires capacity building and education
- OS education usually foregrounds the common good of openness, and the potential for science in service of society

- These strongly aspirational approaches are characterised by a number of issues:
    - Focus on the potential of OS to yield a globally accessible research resources – digital asset focus
    - Foreground the responsibilities of individual researchers to contribute and safeguard digital assets
    - Promoting shared community values and practices promotes idea of a truly global OS community

- Recognized concerns of/barriers to OS tend to focus on buy-in from researchers
    - Cost
    - Community concerns
    - Fragmented policy and the need for alignment of legislation, values and practices
    - Existing monopolies (ie. OA) and lack of willingness to change the *status quo*
- Conversations are starting around incentivisation and rewards as well as developments in funding and policy requirements as a means of driving OS agenda forward

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WILL INCENTIVES AND EDUCATION LEAD TO A DIGITAL COMMONS?

OS-aligned career incentives

OS education for capacity building and culture change

Policy and funding to facilitate roll-out of OS

- **Global Digital Commons (?)**
- Digital resources free from access restrictions – *shared ownership* of research resources
- *Communal management* of resources
- Unlimited nature of digital resources means that there are no restrictions on users
- Development of OS community practices and values will safeguard abuse of resources and ensure global usability

- *Question: can the current OS movement support the evolution of a future global digital commons?*

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DRIVING THE OPEN SCIENCE MOVEMENT FORWARD

- OS is a *dynamic socio-technical landscape* as well as a cultural movement

  - Continually evolving technical infrastructures

  - (Re)categorization of knowledge structures

  - Community selections and preferences of infrastructural elements shape enactment of openness

- Recognizing the dynamic nature of the OS socio-technical infrastructure should raise some important concerns for our current approaches to capacity building:

  - Focusing on aspirational/desired end-points (ie. digital commons) can detract from critical assessments of current infrastructures

  - Intentions of open research products being "for everyone" may not necessarily translate into actuality

  - Enthusiasm of, and for, speed of transformation can mean that compromises can be made in roll-out of technical landscape

# SCRUTINIZING THE SOCIO-TECHNICAL OS LANDSCAPE

- So, if we look more closely at the OS socio-technical landscape, what do we see?
- OS was initially a reaction to the problems inherent in traditional/"closed" research – "bottom-up" movement
  - Design of elements reflected preferences and needs of "bottom up" communities involved – not necessarily the best solutions for the global research community more broadly
- OS is an umbrella term for a lot of different activities – despite overarching theoretical commitments and overlaps
  - Evolution can be seen as disjointed, unstructured and compartmentalised
- Until recently, funding was extremely varied
  - Elements that were funded reflected priorities of communities and funders, as well as geographic location
- Institutional OS depended largely on champions and supportive leadership … and budget!
  - Case studies and "best practices" not necessarily representative of global research community
- Digital nature of OS activities reinforced assumptions of global applicability
  - Little (initial) critical reflection on whether systems would work for globally distributed research communities

# LESSER-DISCUSSED AREAS FOR CONCERN

- Need more critical discussions about the development of the OS socio-technical landscape

- Assumption of commonality of values and challenges together with a self-imposed (frantic) speed of change means that elements of the OS landscape often elude scrutiny

- Need to question whether these are really elements that truly reflect the ideal of a global digital commons

- Key issues to discuss include:

  - What are the implications of having a mixture of community led, academic and commercial investments in the technical landscape of OS?

  - Can we be sure that scientific communities around the world and different user communities are equally represented in OS discussions and decision-making?

  - What happens to openness when it is not possible to separate OS movement from geo-political-economic contexts?

1. MIXING BUSINESS AND OS

- Increasing number of commercial companies providing OS infrastructure or tools

- Definite positive elements to the inclusion of business – resources and expertise

- However, there are also issues that need continual monitoring:

  - Commercial companies are beholden to shareholders and are profit-oriented – these can conflict

    with OS values

  - Commercial companies are dependent on market forces

    - urgent need to build user communities could lead to dominance of "biggest instead of best"

    - failure of company (for whatever reason) can disrupt OS landscape

  - Common "freemium" models of business can cause exclusions of researchers for whom

    - subscription fees are beyond reach (ie. low-resourced researchers and early career researchers)
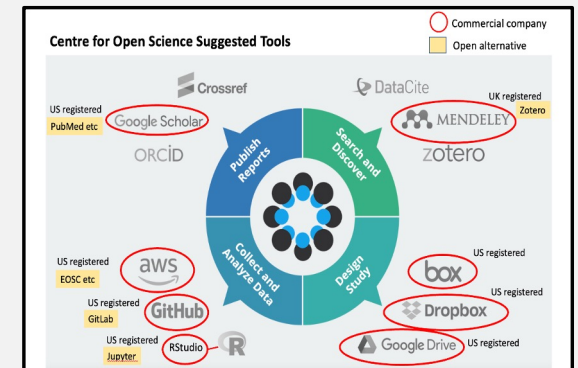
Dominance of commercial companies in COS recommendations
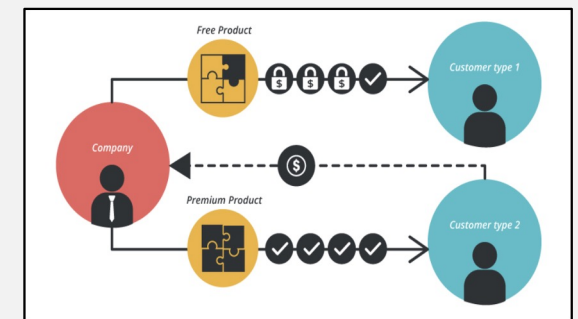
Freemium models and membership fees

2. GETTING THE RIGHT PEOPLE AT THE TABLE

- Researchers from low/middle-income countries (LMICs) continue to be under-represented in OS discussions and communities

- Considerable implications for the evolution of the OS technical landscape

  - Technical innovations may not represent needs and requirements of LMIC researchers

  - Technical innovations may be exclusionary due to socio-economic contexts (ie. cost of data, speed of bandwidth)

  - Lack of contrasting dialogue can lead to a tendency to import solutions "wholesale" to LMICs without appropriate adapting or redesign

  - Destructively can frame many OS discussions on LMIC involvement in terms of "catching up" rather than co-development


Differing technical systems

| Overall Rank	Country	Average price of 1GB (USD)
155	🇲🇼 Malawi	$27.41
154	🇧🇯 Benin	$27.22
153	🇹🇩 Chad	$23.33
152	🇾🇪 Yemen	$15.98
151	🇧🇼 Botswana	$13.87

Cost of data and bandwidth speed

3. PRESERVING OPEN SCIENCE AS AN APOLITICAL ZONE

- OS technical infrastructure dominated by US, UK and EU

- Recent studies have highlighted discrepancies in access that can be linked to financial sanctions

- Commercial and government-funded resources in countries holding financial sanctions can be geoblocked to researchers in the under-sanction country

- As financial sanction regimes are continually changing (ie. Russia) this can lead to rolling inequalities within the OS landscape

- Complexities of legal and financial legislation makes it difficult to sort out these issues and debate the imposition of politics on the OS landscape

GithubUserContent Is Blocked In Iran!
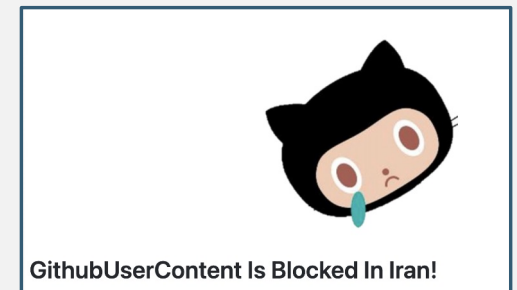
Sanctions and geo-blocking
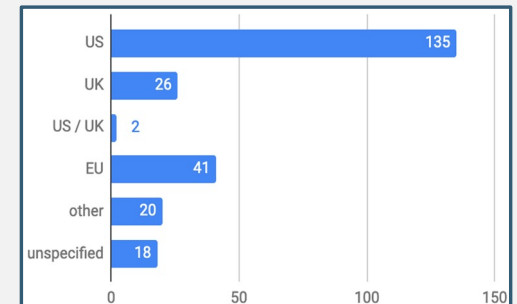
Shanahan and Bezuidenhout 2022

4. TAKING INCLUSIVITY SERIOUSLY

- As the OS landscape evolves, there will be a more diverse pool of users

- Accessibility
  - Considerable resources available to make research products accessible to users with impaired vision or hearing, and cognitive challenges such as dyslexia
  - Poorly integrated into current OS activities
  - Need proper commitments to true inclusivity

- Language
  - Dominance of English within research and OS should not drive out efforts to diversify linguistic availability of resources
  - FAIR data needs linguistic diversity for metadata and controlled vocabularies to enable multi-lingual, accurate searching

- Science literacy
  - Rise in citizen science communities
  - Can't be reliant on science literacy, familiarity with research data management or access to ICTs
  - Need to rethink how information are presented, packaged and made available for reuse

USER EXPERIENCE

THE POTENTIAL OF OS IS AFFECTED BY THE STRUCTURES THAT UNDERPIN IT

- Uncritical expansion of the OS landscape can (unintentionally) introduce biases and exclusions that do not reflect the values of OS or the possibility of a true digital commons

- Accessible data does not necessarily mean equal access and reusability

- Need to educate researchers to scrutinize OS structures and productively mediate future development

- Exciting times to start these conversations

www.openuphub.eu/component/k2/item/610-101-innovations-in-scholarly-communications
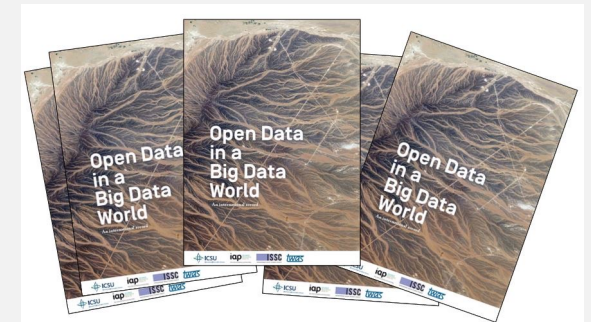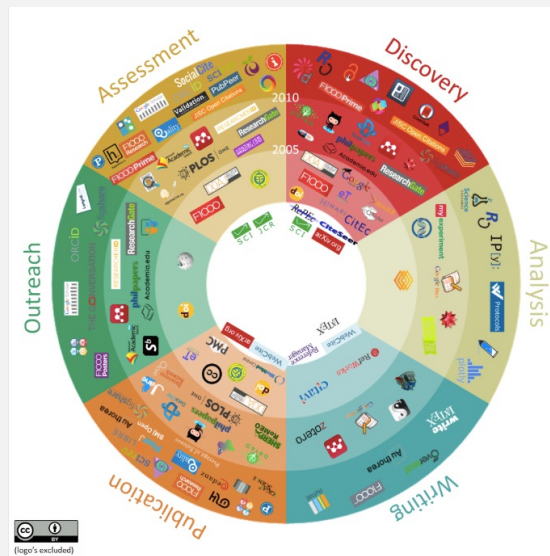
OPPORTUNITIES FOR AFRICAN RESEARCH

- Not just "catching up"

- Need more African researchers in OS conversations – particularly in global research communities such as RDA

- Historical precedent for Open Science in LMICs that can be capitalized on

- Opportunities to build new infrastructure from scratch(ish) means that these key issues can be properly scrutinized and addressed

- Observing challenges of HIC Open Science initiatives and infrastructures can highlight areas to address
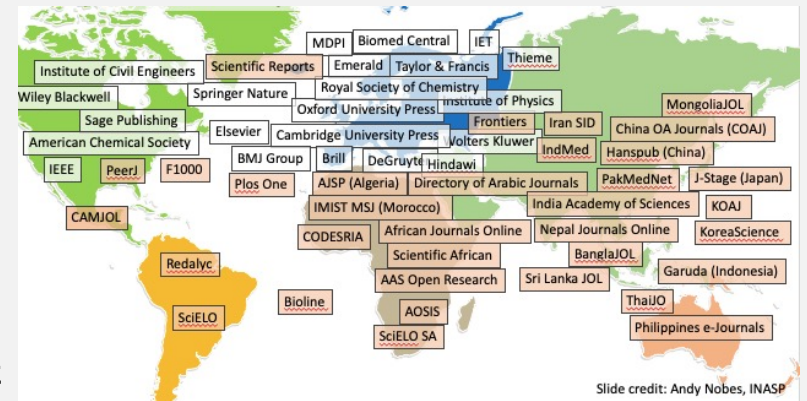
Slide credit: Andy Nobes, INASP

Image credit: Andy Nobes

OS IN THE FUTURE: A TRUE DIGITAL COMMONS

- Timely scrutiny of the OS landscape that we are building and committing to can ensure that the OS movement does indeed support a future digital commons

- Digital commons discussions around OS continue to lack diversity in framings of community of users

- By increasing the number of people critiquing the systems being developed we stand a better chance to ensure that the OS structures being built do not reinforce (or introduce) marginalization, power inequalities and exclusions

- Researchers need to realise that they are in control of this future

- *Key challenge: how best to build OS infrastructures – globally and in Africa – that support inclusion and epistemic justice*

THANK YOU

- Thank you for your attention
- Please feel free to contact me at louise.bezuidenhout@dans.knaw.nl or @loubezuidenhout on Twitter
- Thanks to my collaborator Prof Hugh Shanahan for the work on sanctions and access restrictions
- Thanks to DANS and EOSC Synergy for support