Towards a common Vision on Open Science: FAIR-Data Culture and National Data Infrastructure in Ethiopia

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20 November 2018 – e-IRG Special Edition Workshop – Vienna (Austria)
Outline

• Introductory considerations

• e-Infrastructure projects in Africa

• The Sci-GaIA project and its legacy

• The National Academic Digital Repository of Ethiopia (NADRE)

• Summary and conclusions
“My” e-Infrastructure projects “vs. time”

- International (FP6, FP7, H2020)
- National (PON, POR, PRIN, ...)

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<tr>
<th>Year</th>
<th>International</th>
<th>National</th>
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<tr>
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“My” e-Infrastructure projects “vs. space” (outside Europe)
Consideration #1: Some global “connections”

Challenge: Make African science and scientists more visible to the world

Opportunity: Uptake e-Infrastructure and the Open Science paradigm to do that
Consideration #2: Open Data availability

Open Data Barometer (2016 Report)

The Open Data Barometer
A global measure of how governments are publishing and using open data for accountability, innovation and social impact.
Consideration #2: Open Data availability

Global Open Data Index

Action #1: Foster FAIR data infrastructures in Africa
Consideration #3: The Triangle of Knowledge

Building e-Infrastructures is a waste if we don’t “build”, at the same time, their users. Along with e-Infrastructures, t-Infrastructures and training programmes are also needed, as Open Education Resources (OERs).

Action #2: Train a new generation of Open Science Champions

Research & Development

Innovation

Education & Training

Infrastructure
(Some) e-Infrastructure-related projects in Africa

- FEAST Project
  - 2008
- GLOBAL
  - 2008
- euroafrica-ict
  - 2008
- el-Africa
  - 2006
- EUMEDGrid
  - Support
- EPIKH
- The EuroAfrica-ICT/P8 Initiative
  - Strengthening ICT research & policy links under the 8th Strategic Partnership
- Sci-GaIA
  - Enabling Scientific Endeavor through Science Gateways and e-Infrastructures in Africa
The Sci-GaIA Project
(www.sci-gaia.eu)

• **Energising Scientific Endeavour through Science Gateways and e-Infrastructures in Africa**

• Research Infrastructures – Coordination & Support Action

• Grant Agreement no. 654237

• EC contribution: ~1.4 MEuro

• Start date: 1 May 2015

• Duration: 24 Months
The Sci-GaIA Federated Platform for an Open Science Commons in Africa

www.sci-gaia.eu/osp/
# Sci-GaIA Training & Educational Material

(www.sci-gaia.eu/materials)

## Lecture #1
- **Content:**
  - Sci-GaIA Project
  - INDIGO DataCloud Project

## Lecture #2
- **Content:**
  - The Future Gateway framework
  - Overview - APIs - Tutorial

## Lecture #3
- **Content:**
  - The gLibrary framework

## Lecture #4
- **Content:**
  - Programmatic interaction with Open Access Repositories

## Lecture #5
- **Content:**
  - The Onedata platform

## Lecture #6
- **Content:**
  - The Ophidia platform

## Lecture #7
- **Content:**
  - The Kepler workflow manager

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**Section 1 - Science Gateway**

**Section 2 - e-Infrastructure**

**Section 3 - Science Gateway**

**Section 4 - e-Infrastructure**
“FAIR” Open Educational Resources
(www.sci-gaia.eu/materials)

- Textbook, virtual appliance and video-lessons (on OAR)

Virtual appliance for assignments and hands-ons

Slides

Each Open Educational Resource has a DOI

Video-lessons
The Platform for MOOCs
(courses.sci-gaia.eu)
The e-Research Hackfest Model
(www.sci-gaia.eu/summer-hackfest)

• Day 1 and 2
  • Presentation of the technologies/tools

• Day 3
  • Presentation of the use cases (with indication of the technologies/tools adopted)

• Other days
  • Implementation of the use cases

• Locations:
  • Catania (Italy, twice)
  • Lagos (Nigeria)
  • Addis Ababa (Ethiopia)
The e-Research Hackfest Model
(www.sci-gaia.eu/summer-hackfest)
Evaluation of Sci-GaIA Hackfest for Educational Purpose

Conclusion

⇒ The Horizon 2020 Project Sci-GaIA introduces a Hackfest approach that fulfills the requirements of courses in formal education.

⇒ Sci-GaIA Hackfests build on the cognitive domains (analysis, synthesis and evaluation) and allow to describe the objectives, activities, methodology and the evaluation process in a syllabus. Teaching and learning methodologies are set out based on cognitive domains as problem-solving and research-oriented methodology. Subject for assessment is the result achieved and students’ competence.

⇒ Working with ‘big data’ is seen in Sci-GaIA Hackfest as the starting point for an innovative idea.
The 35 Sci-GaIA “champions”
(www.sci-gaia.eu/champions)
The Sci-GaIA "champions"

Use Case Description

Kenya National Public Health Gateway

The use case aims to develop a National Public Health Gateway for the National Public Health of motorcycle-related accidents and their effects on the economy. The use case involves the collaboration of Public Health experts, motorcycle-related accident experts, and the motorcycle industry to address the challenges of motorcycle-related accidents and their effects on the economy. The collaboration involves the development of a platform for data sharing, analysis, and visualization to support evidence-based decision-making in the public health sector.

References

Presentation 1 - Presentation 2 - Poster

BACK TO ALL CHAMPIONS
“Bird’s eye view” of the CoPs supported by the Sci-GaIA project
(www.sci-gaia.eu/community)
“5 stars”(*) Linked Open Data Federation

LOD Federation

Semantic Enrichment

Open Data Repository

Standard interface

Case study

https://5stardata.info/en/
The e-Infrastructure Knowledge Base and the Semantic Search Engine

> 4,000 repositories
> $3 \times 10^7$ docs/datasets/OERs
Everything is... FAIR
• In January 2017, an agreement was established between UNICT and the Conference of Italian University Rectors (CRUI) to extend the possibility to provide DOI-prefixes to all African organisations wishing to deploy an institutional Open Access Repository

• 5 DOI prefixes released so far:
  • The African Population and Health Research Centre (KE and Intl.)
  • The Eko-Konnect Research and Education Initiative (NG)
  • The Ministry of Education of Ethiopia, through EthERNet
  • The Ubuntunet Alliance (MW and Intl.)
DOI prefix for Ethiopia was requested (and approved) at very high political level
GrIDP Identity Federation as official member of eduGAIN inter-federation
(https://gridp.garr.it)

- Since the 26th of August 2016

First non-country-based Identity Federation
First Identity Federation not operated by an NREN
Gathers several Identity Providers and Service Providers in Africa
Provides SAML based Federated AuthN and «social» SSO services to «homeless» users
The Knowledge Workflow
(to enable a Knowledge Society)
The Knowledge “Nexi”
(to enable a Knowledge Society)
A little bit of history after the end of Sci-GaIA

- **November 2017** – EthERNet hosts the UbuntuNet-Connect 2017 conference; the special workshop *Towards an African Open Science Platform Infrastructure Framework* is held as side-event
  - Outcome: The Ministry of Education attends the workshops and announces later on the news the decision to create a *National Academic Digital Repository for Ethiopia* -> **NADRE concept starts**

- **February 2018** – The **NADRE Kick-off Conference** is hold in Addis Ababa with the participation of international experts
  - Outcome: in March, GIZ open a tender for a service provision for the “Implementation of the NADRE”

- **June 2018** – My team’s bid won the tender -> **the actual implementation of NADRE starts**

- **August 2018** – The workshop on *Research Data Stewardship and e-Infrastructure for Ethiopian Stakeholders* was held in Gondar as a NADRE side-event co-organized by ESC and the University of Vienna – Fulfilled needs emerged ay the Kick-off Conference
NADRE Mission

• The National Academic Digital Repository of Ethiopia (NADRE) intends to provide researchers, lecturers, students and stakeholders from outside of the academic world access to all research works published by Ethiopian universities and research institutions
• All public and private universities as well as research institutions will contribute to the NADRE and will provide all citizens access to it
• In order to complement and feed the NADRE each Ethiopian university is encouraged to build its own repository and to provide the Ethiopian Research and Education Network (EthERNet) access to that university repository in order to harvest and amalgamate publications from these repositories to a compiled National Academic Digital Repository of Ethiopia
• Those universities that are not currently able to establish their own repository will get support from EthERNet to deploy their own Institutional Academic Repository (ADR). However, each university will be responsible for the curation of contents stored its own ADR
Stakeholders

MoE

Policy

Funding

Ethiopian Universities

Stakeholders

MoE

Policy

Funding

Ethiopian Universities

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Ethiopian Universities
Objectives

1. To increase the access of academics and citizens in Ethiopia and worldwide to research works published by Ethiopian researchers at one of the Ethiopian universities or research institutions
2. To foster the dissemination of research outcomes and make them, as well as their authors, more visible inside and outside the country
3. To spread completed research to other corners of the country to allow other researchers to build on. For the time being, the NADRE will mainly include Master theses, dissertations, journals, articles, conference proceedings as well as all works published by researchers from Ethiopian universities and research institutions as well as from Ethiopian researcher living abroad. All artefacts will be published under Creative Commons licenses and will be tagged with Digital Object Identifiers (DOIs)
Responsibilities of universities and research institutions are the following:

- Those universities and research institutions with a repository will provide access to it in order to accommodate it within the NADRE repository.
- To disseminate among their researchers the standards necessary to accommodate research works to the NADRE repository.
- To promote the creation of ORCID IDs by their researchers.
- To manage the issuance of DOIs to tag research documents.
- To handle the license issue with their researchers.
- To run the plagiarism check, prior the research documents will be provided to the NADRE.
- To curate their ADR.

Responsibilities of EthERNet are the following:

- To provide the space on the cloud or server to host the NADRE and the ADRs of those universities and research institutions requesting them.
- To provides the technical support.
- To do the programming necessary for the NADRE to be fully accessible and in operation.
- To manage the creation of DOI sub-prefixes to those universities and research institutions requesting them.
- To inform universities and research institutions how to request and obtain a DOI prefix for their ADR.
- To train local IT staff to cope with the IT-related challenges arising during their ADR's operation and maintenance.

Responsibilities of ESC are the following:

- To coordinate between universities and research institutions and EthERNet.
- To advise users how to work with the NADRE, how to get an ORCID ID and how to link research works to the ORCID profiles of their author(s).
- To organize workshops and tutorials for digital librarians and curators of the local ADRs.
- To report towards the Ministry of Education.
Workplan (1/2)

A1 – Prepare and contribute to the implementation of the Conference, including the Pre- and Post-Conference Workshops

- The Terms of Reference for this series of venues describe the content and the output/outcome (**DONE**, check [this link](#))
- In the Pre-Conference workshop all participants have to become familiarized with DOIs and the ORCID IDs (**DONE**, check [this link](#))
- All researchers participating at the Conference should receive their ORCID IDs by the end of the Conference (**DONE**)  
- The Post-Conference workshop participants will get trained on how to use and maintain repositories (**DONE**, check [this link](#))

A2 – Elaborate a Training Plan

- The reports from the Conference workshops will structure the next steps in the training to implement and to use the university repositories and NADRE. Detailed training plans follow for cluster universities with session on remote and at place **DONE**: (i) the time plan of the NADRE Training Workshops has been defined and the agendas can be inspected [here](#), (ii) the time schedule of the NADRE Webinars has also been defined and it can be inspected [here](#)
A3 – Conduct a Workshop series
At 4-5 cluster universities workshops will take place. The agenda for the workshops will be structured in accordance to the needs of librarians and their ICT staff as discovered during the Conference Workshops and has been analysed in the Conference workshops (DONE, the agendas of the NADRE Training Workshops can be inspected here)

A4 – Establish a NADRE Website and Manual
A NADRE [Website](#) and [Manual](#) will compile the information necessary to use and maintain NADRE in an efficient and sustainable way for the users (researchers and students) and the NADRE experts (librarians and the ICT-staff). (DONE, both the [Website](#) and the [Manual](#) have been released)
About 330 Ethiopian users (researchers, teachers) and experts (librarians, IT staff) have been reached in 5 events across the country.
NADRE Website and Manual

https://nadreweb.ethernet.edu.et

https://nadreweb.ethernet.edu.et/doc/documentation
The NADRE Repository
(https://nadre.ethernet.edu.et)

OpenDOAR, ROAR, and WorldCat Digital Collection Gateway compliance checks are in progress - Core Trust Seal is planned.

About 100 new ORCID IDs have been created and «linked» to NADRE through DataCite DOIs.
Summary and conclusions

• Sci-GaIA legacy is surviving well beyond the end of the project and it’s having a durable impact on Africa

• Several Sci-GaIA Open Science Platform services have been used to build NADRE

• Besides its technical aspects – we are in the process of defining the automatic procedure to copy contents from institutional repositories to the central one - NADRE is triggering a discussion on an Ethiopian National Open Access/Data/Science Policy, which is currently in preparation

• NADRE services are FAIR and they can be “cloned & customized” wherever needed

• NADRE interest is actually going beyond the Ethiopian borders:
  • We are supporting the Rwanda Association of Local Government Authorities (RALGA) to deploy an e-library and an e-learning service for MOOCs based on NADRE ones
  • We have started discussion with the Human Resource Development Council in Botswana
Thank you!

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