Establishing a Health Informatics Research Lab in South Africa

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Deshendran Moodley¹,², Anban W Pillay³, Richard Gakuba⁴ and Christopher J Seebregts²,⁴,⁵,⁶

Presenter: Dr Richard Gakuba; richard.gakuba@jembi.org

¹ Department of Computer Science, University of Cape Town
² Centre for Artificial Intelligence Research, South Africa
³ School of Mathematics, Statistics and Computer Science, University of KwaZulu-Natal
⁴ Jembi Health Systems NPC, South Africa, Mozambique, Rwanda, Zambia
⁵ School of Public Health and Family Medicine, University of Cape Town
⁶ Jembi - SAMRC Collaborating Centre for Digital Health Innovation
Background

● Research Question:
  ○ "Can an applied Computer Science research lab in a sub-Saharan African university facilitate and enable local capacity development and sustainable innovation of relevant health information technologies?"

● Objectives
  ○ Establish a Health Architecture Laboratory (HeAL), reflect on and learn about the structure, governance, outputs and influence of the HeAL project at different levels (organizational, national, regional and global)
  ○ Conduct world class research into the application of enterprise architecture, interoperability of the components of a health information system and health informatics in low resource settings
  ○ Train highly skilled postgraduate students in Computer Science with a specialization in health informatics
  ○ Identify technology gaps in health information systems and develop new and relevant technologies and architectures for application in field sites through "living labs".
Methodology

● Developed a research agenda to guide and focus the activities of the HEAL and formulate selection criteria for research projects.

● Created a capacity development plan for recruiting and training highly skilled graduates and researchers in this area, which also informed the research agenda and vice versa.

● Developed a governance structure for the HEAL, including selection criteria, roles and guiding principles for the Student Selection Committee and the Scientific Steering Committee (SSC).

● Evaluated the operation and processes of the HEAL.

● Evaluated the research and training of the HEAL.

● Translated and transferred knowledge produced by the HEAL to appropriate communities.

● Established an outreach and collaboration strategy.
HeAL Innovation and Development Ecosystem (IDE)
Develop Technology Demonstrators (few examples)

1. OpenHIM - multiple production deployments (Jembi)
2. A prediction tool for HIV antiretroviral drug resistance from clinical data - completed research prototype, contributed community software component (Jembi and the Africa Centre for Health and Population Studies)
3. An ontology and knowledge based repository for structuring (TB) treatment adherence knowledge, research prototype (HeAL in-house project)
4. An eHealth regulation ontology, research prototype (Jembi and HeAL in-house project)
5. A framework for selecting and adopting an appropriate NHIS architectural approach in a sub-Saharan Africa country (HeAL in-house project)
Produce Research and Academic Papers


An Architecture and Reference Implementation of an Open Health Information Mediator: Enabling Interoperability in the Rwandan Health Information Exchange

Ryan Crichton¹,², Deshendran Moodley¹, Anban Pillay¹, Richard Gakuba³, and Christopher J. Seebrégots¹,²,⁴

¹ Health Architecture Laboratory, Centre for Artificial Intelligence Research, University of KwaZulu-Natal and Council for Scientific and Industrial Research, Durban, South Africa
² Jembé Health Systems, Cape Town and Durban, South Africa
³ eHealth Coordination Unit, Ministry of Health, Rwanda
⁴ Medical Research Council, Cape Town, South Africa
MomConnect: an exemplar implementation of the Health Normative Standards Framework in South Africa

Authors:
Christopher Seebregts, Peter Barron, Gaurang Tanna, Peter Benjamin, Thomas Fogwill

Designing for scale: optimising the health information system architecture for mobile maternal health messaging in South Africa (MomConnect)

Analysis
Results

- The HeAL project was highly successful in meeting its overall aim and major objectives.
- It successfully established an applied Computer Science research lab at UKZN.
- HeAL is now embedded in the Centre for Artificial Intelligence Research which ensures its sustainability and exposes it to new partners and elevates its potential influence and impact in South Africa.
- It successfully introduced and evolved an innovation ecosystem which harnesses and coordinates the strengths of academic, research and implementation partners to create a sustainable system for rapid innovation for health information technologies in Africa.
- Its key technology output, the OpenHIM, is deployed at multiple sites in Rwanda and South Africa and is recognized as one of the foremost solutions for interoperability for health information exchange in Africa.
- In terms of capacity development it graduated two highly specialised and talented postgraduate students who are playing leadership roles in the health information space.
Conclusions

- "Can an applied Computer Science research lab in a sub-Saharan African university facilitate and enable local capacity development and sustainable innovation of relevant health information technologies?"
- Our findings show that despite several challenges this is not only possible but integral for a sustainable system of innovation for health information technologies in Africa.
- A key output of the lab, the HeAL innovation ecosystem, has already been used to deliver and deploy an integral technology solution for interoperability.
Current and Future Directions
Developing Expertise in Interoperability and National Health Information Systems
Next Steps: Syndicating the HeAL

MoUs set up with Future Labs

- University of Eduardo Mondlane, Mozambique - CRVS Systems
  - Civil Registration and Vital Statistics
- University of Rwanda
  - Health Information Exchange
- University of Limpopo, South Africa
  - Electronic Medical Records
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Contact Details
richard.gakuba@jembi.org | chris.seebregts@jembi.org