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Developments in regional SADC Cyberinfrastructure to support Collaboration,Open Data and Open Science

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\begin{abstract}
There is a convergence of data and compute intensive paradigms and a proliferation of research, and projects in these areas and applications. There also is a global trend in developing distributed and federated high performance data cyberinfrastructure and e-infrastructures to support to research, encourage collaborations and to facilitate data sharing for open science. These cyberinfrastructures can also be used to share expensive instruments and resources including high performance computing (HPC) resources through connected research networks. These efforts are typically aimed at accelerating research and discovery across domains and countries often reinforcing National, Regional or Continental objectives or geopolitical objectives such as integration.

Regionally, the Southern African Development Community (SADC) countries have engaged and developed a regional collaborative Cyberinfrastructure Framework. The vision around the regional cyberinfrastructure is that of -

“An education, research and innovation environment that provides for human capital development and shared access to unique or distributed facilities to impact socio-economic development in the SADC region and promote knowledge based economy”

The Cyberinfrastructure proposed in the Framework will cover;

1. National Research Networks - Specialized broadband infrastructure networks and service providers for education, research and innovation ,
2. Computational Resources - Ranging from HPC to other computing capabilities ,
3. Data - tools and facilities (including repositories) to enable sharing and efficient data driven discoveries, technologies and innovations,
4. Policies - To enable optimal establishment and utilization of cyber-infrastructure, generation, analysis, transport as well as stewardship of information, and
5. Human Capital - To make effective use of the Cyberinfrastructure.

The Framework will seed and form a basis for a SADC Cyberinfrastructure Strategic Plan with the goal to promote high level quality education, research and innovation; accelerate technology transfer, commercialization and industrialization in SADC, and to promote shared cyberinfrastructure commons (i.e. infrastructure and capabilities).

It is also envisaged that once developed - the cyberinfrastructure will add value to scientific programmes, foster partnerships and collaborations
and develop regional Cyberinfrastructure networks through interconnecting HPC centers, scientists and research on regional priority challenges. For example, once fully developed, the infrastructure will also enable the region to address regional priority challenges in the areas of Energy, Water, Climate, Agriculture, Health and provide capability to support the global projects such as the Square Kilometer Array (SKA), continental project like the H3Africa Human Heredity and Health in Africa, promote citizen science and will help facilitate science research and education in the continent.

The Framework proposes an implementation plan to cover the key focus areas of;

1. Policy or Strategy Development - institutionalization, implementation support,
2. Education, Research & Development and Innovation,
3. Human Capital Development,
4. Infrastructure Development,
5. Resource Mobilization, Communication, Awareness & Advocacy and
6. Strategic Partnerships.

Finally the framework proposes governance structure for the Cyberinfrastructure strategic plan comprising of the key stakeholders of relevant SADC Ministerial Committees, thematic Groups, international advisory experts Group; regional expert working groups and centers of excellence.

\end{abstract}

\keywords{Cyberinfrastructure, High Performance Computing, Open Data, Open Science, NRENs, Policy.}

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