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ON SCIENCE AND TECHNOLOGY FOR DEVELOPMENT (CSTD)**

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Contribution by South Africa

**to the CSTD 2024-2025 priority theme on “Diversifying economies in a world of
accelerated digitalization”**

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Priority theme 1: Diversifying economies in a world of accelerated digitalization

1. What are the specific challenges your economy is facing to develop or adapt frontier technologies and AI?

The challenges faced are multi-faceted.

(1) Firstly, there is the challenge of digital inequality and appropriate capacity development to create sizable development in AI. Most the training in AI is currently generic and not focused on AI to develop the required skills to transition the economy towards making an impact across various sectors.

(2) The extent of investment to drive an AI ecosystem is a challenge in South Africa and across the continent. To make sizable shifts in an AI economy, there needs to be sizable investments and incentives to stimulate the AI ecosystem in South Africa and the continent.

(3) Currently, the availability of process capacities to drive AI development is a barrier to undertaking sizable projects in AI. Most providers are from the Global North (Google, AWS, etc). There needs to be investment towards local cloud providers that could provide hosting of AI-based services to drive local economies and growth in the AI sector.

(4) There is still a need to develop suitable datasets that are suited to the local markets and the continent. Consider languages as an example. Most Large Language Models are mainly oriented to Global North languages and not to the Global South languages, and in particular, to South Africa and the continent.

(5) A big challenge still in the South African context is with regard to Policy and Regulation. While South Africa is making progress in the development of a National AI policy, the policy still needs to be gazetted with an appropriate regulation framework that also needs to be developed.

2. Can you provide successful examples of AI and other frontier technologies uptake in your country?

Some examples, in the Healthcare sector:

- PathAI develops machine learning technology to assist pathologists in making more accurate diagnoses. The company aims to reduce errors in cancer diagnosis and develops methods for individualized medical treatment.

- Deep Genomics' AI platform helps researchers find candidates for developmental drugs related to neuromuscular and neurodegenerative disorders. Finding the right **candidates**

during a drug's development statistically raises the chances of successfully passing clinical trials while also decreasing time and cost to market.

- Envision Deep AI provides an AI-based solution for medical imaging diagnosis.
- VirtuvanMD uses AI-based solution for medical diagnostics.
- TeleSensi™ CARDIAC is a stand-alone, cloud-based, AI murmur detection service.

Some examples in the Farming sector:

- Aerobotics provides insights into precision agriculture monitors crop conditions, soil quality, weather patterns, and pest infestations by using sensors, drones, satellites, and big data.. Their technology can help farmers make more informed decisions and maximize their yields.
- Future farms and Kobus Vertical Farming leverage AI to manage temperature, humidity, and lighting in their farms. This allows for more efficient and sustainable agriculture practices.
- AFGRI makes use of AI to analyse the behavior of livestock to optimize their well-being and productivity.

In the languages space, do see a few examples below:

- Lelapa AI, a Johannesburg-based startup uses machine learning to create AI tools for African languages. The InkubaLM natural language processing (NLP) model has been designed to support and enhance low-resource African languages – Swahili, Yoruba, isiXhosa, Hausa and isiZulu.

3. Has your country put in place inclusive policies for innovation and economic diversification specifically tailored to diffusion of digital technologies and AI?

This is answered in (5) above.

- Do you have examples of policy instruments in place to favour the diffusion of frontier technologies in the economy and targeting specific sectors?

The current status of policy development in South Africa can be found at <https://www.dcdt.gov.za/sa-national-ai-policy-framework/file/338-sa-national-ai-policy-framework.html>

4. Has your country put in place mechanisms to strengthen industrial capabilities through partnerships among different stakeholders (e.g., university-industry, or private-public)?

Through the DCDT, the AI Institute of South Africa (AI-ISA) established hubs across the country to strengthen the AI adoption strategy in South Africa. Details can be found at: <https://www.itweb.co.za/article/south-africa-scales-up-number-of-ai-hubs/kLgB17ezEJIM59N4>

5. How can international cooperation support the uptake of new technologies and the development of technological capabilities in your country and ensure that industrial policies will benefit all and do not worsen inequality?

Collaboration with international partners is imperative to grow fully inclusive AI ecosystems. An example of this is the establishment of an AI Career Tech center that was launched at TUT. Details can be found at <https://www.tut.ac.za/latest-news/196-tut-and-intel-to-launch-first-class-intel-ai-career-tech-centre>

6. What can do the UN CSTD to support an economic transformation that enhances your country productive capabilities and foster an inclusive digital transformation?

As highlighted above, one of the challenges with the growth of economic transformation in South Africa and in the continent is with regard to investment. Bringing about considerable support with regard to using AI as a platform to drive development in South Africa and across the continent with a focus to the SDGs would be a great support.