

The Fourth Industrial Revolution and its Implications for African Languages

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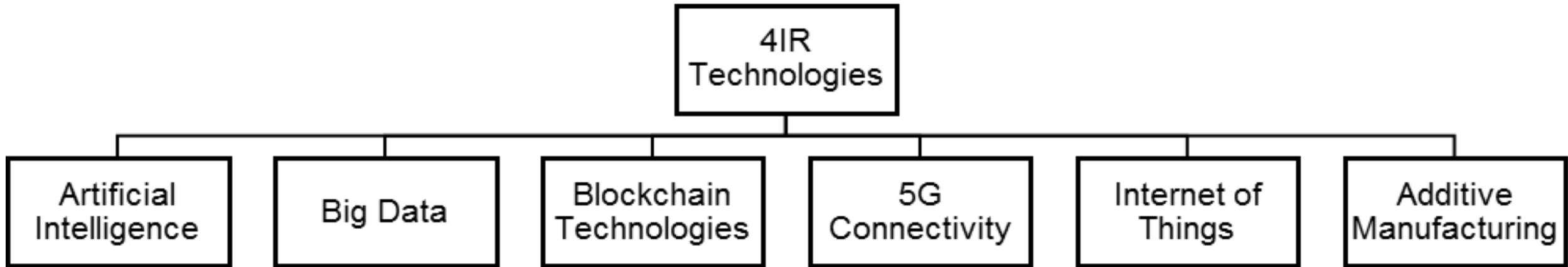
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29 October 2020

AFRICAN LANGUAGES AND THE 4IR

1. 4IR Technologies: An Overview
2. Language and the 4IR
3. African Languages and the 4IR
4. Policy Imperatives

4IR Technologies: An Overview



- Convergence (e.g., Big Data & AI; 5G and IoT).
- Industrial change, social implications.
- Presents unique opportunities for indigenous African languages and the humanities

Language and the 4IR

- Natural language processing (NLP) branch of AI: how computers learn to ‘understand’ speech, text (sentiment analysis).
- Deep Learning: supervised vs unsupervised learning, potential downsides (Microsoft Tay *via* Twitter).
- Labelling & annotation – English bias (Carnegie, Machine Learning report, 2019).
- Applications in web browsing (Google Translate), call centre automation, assistants (screening and directing).
- Effects of COVID-19: remote learning and NLP.

African Languages and the 4IR

‘State of Language in Africa’

- Linguistic diversity (over 2,000: 1 in 3); some have few books to teach the grammar and syntax, others on the verge of extinction.
- Different countries differ in constitutional protections, language often political (70% territorial contiguity).

‘Digital Space and Language’

- Only 28.2% of people in Africa have access to the internet (ITU, 2019), and estimated 3% of app developers in Africa (vs being 17% of the planet’s population).
- 54% of the contents on the Internet are in English; 7,100 languages in use around the world (Cultural Research Lab, 2019).

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African Languages and the 4IR

‘International Economics and Language’

- A 2018 finds that the number of OSS projects [GitHub] in a country correlates to its GDP ($\rho=0.75$).
- Nigeria, with the largest economy in Africa, imports 90% of all its software. Local production of software is “reduced to add-ons or extensions creation for mainstream packaged software.”
- Algorithm colonization of Africa (Birhane, 2020).

African Languages and the 4IR

Challenges

- Economic size (HDCs, GDP correlation).
- Internet penetration.
- Internal cohesion (politics).

Opportunities

- Youth bulge (pan-African outlook).
- Cultural heritage.
- Partnerships.



COVID-19

AI-powered, Local Languages Speaking “Lecturer Avatars”: Multilingual Animations to Support Teaching

“... and it came to past in the pandemic year, the CBE’s Executive Dean, Prof. Daneel Van Lill, spoke fluent Zulu, and the Vice Chancellor, Prof. Marwala, spoke fluent Afrikaans... students watched an AI lecturer give lectures in local South African languages...”

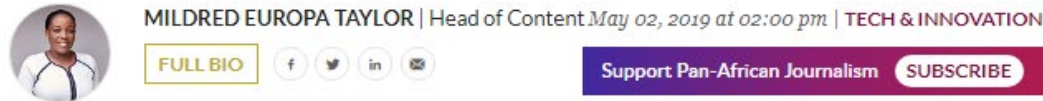
Prof Abejide Ade-Ibijola

- Mother tongue instruction.
- Continual improvement.



Teaching Innovation Videos: <https://tinyurl.com/MEAnimations>

Nigerian man develops world's first AI portal that can translate over 2,000 African languages



10.3k shares



- Diversity of the continent (33% of the world's languages are spoken on the continent.)
- Developers hoping to bridge these language barriers and make life easier with a messaging platform that is capable of translating over 2,000 African languages.
- Real-time cloud-based messaging platform that supports voice and video calls.

OBTalker



OBTranslate

African Languages and the 4IR



- **Reah (Android app): Created and launched in July 2019 by students who attended a year-long course run by Mbula Research and Development startup.**
- **REAH is a platform that bridge the communication barrier between hearing and non-hearing people, anywhere and anytime.**
- **‘Language Uber’.**
- **Reah’s creators are hoping to use artificial intelligence for the live translation, which will extend the service beyond office hours.**



Defining and Domesticating the 4IR



- “Our goal is to **break language communication barriers** in rural and urban areas in Africa and enable self-driving cars, smartphones, linear robots and wireless technology to communicate and interact with Africans in their dialects” (OBTranslate).
- “We have created the words used in certain industries in collaboration with sign language experts and deaf people in the community. We asked them how they would prefer to sign the **new words**” (Reah).


African Languages and the 4IR: Policy Imperatives

1. 4IR Commission's recommendations and language relevance:

- Mother tongue instruction (education, computational thinking).
- Adaptation of lessons from other countries.
- Release of spectrum: data is the prerequisite asset allowing AI systems to function.

2. Consolidation of efforts and policy around 4IR and language at national and AU levels.

3. Commission for the Promotion and Protection of the Rights of Cultural, Religious and Linguistic Communities' (CRL) mandate for the 4IR (e.g., using AI to preserve African languages at risk of extinction).



**“Language as culture is
the collective memory
bank of a people’s
experience in history.”**

Thank you.