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AFRICA 4TH INDUSTRIAL REVOLUTION STANDARDIZATION STRATEGY (2021–2025)

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- African Electrotechnical Standardization Commission (AFSEC)
- African Organisation for Standardisation (ARSO)
- African Telecommunications Union (ATU)
- African Union Development Agency (AUDA-NEPAD)
- Council for Scientific and Industrial Research (CSIR)
- Centre for the Fourth Industrial Revolution-Rwanda (C4IR – Rwanda)
- Dedan Kimathi University of Technology (DeKUT) SIEMENS Mechatronics Certification Center
- IEEE Standards Association (IEEE SA)
- Smart Africa
- Standardization Association of Zimbabwe (SAZ)

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EXECUTIVE SUMMARY

The African Fourth Industrial Revolution Standardization Strategy seeks to provide direction on standardization for the well-being of Africans in the global economy. The strategy also seeks to bridge the gap between the physical and digital world, through collaboration of standardization experts, technology communities, stakeholders and regulatory agencies in assessing industry standards and policy harmonization that enhances trade within the Africa Continental Free Trade Agreement (AfCFTA) single market. The strategy also sets to positioning standards as the key driver and enabler of economic activities, enhancing standards development, using standardization to enable competitiveness of goods and services, adaptation of standardization best practices, institutionalization of effective management and coordination of standardization, taking active leadership role, aligning with other national and regional policies in relation to industry, consumers and environment and finally to facilitate coordination and scaling up standardization in Africa and to provide access to relevant standardization information.

Through the preferred Theory of Change (ToC) the strategy identifies activities that would contribute to improved approaches and coordination of standardization in the 4IR in Africa. The development of the strategy that brought together standards organizations, standards development contributors, research organizations, regulatory agencies, technology producers, and software developers represents the shared vision and aspirations of a broad cross-section of and diverse standards stakeholders in Africa.

The Fourth Industrial Revolution (4IR) provides organizations with opportunities for not only optimizing and enhancing internal operations, but also to innovate and optimize business models. The conceptual model revolves around the four domains of strategic choices namely, strategic execution, technology potential, competitive potential, and service level. The interrelationships of four domains inform the technology aspect, focusing on implementing the chosen business strategy and recognizing the need to address both external and internal domains.

Central to the A4IR Standardization Strategy are the following:

- Balanced standardization policies and collaboration between state and non-state actors
- Balanced data policies
- Capacity building and skill development to enhance productivity
- Continuous experimentation for cyber-physical systems
- Integration of measurements, learning and reporting, and information dissemination

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AFRICA 4TH INDUSTRIAL REVOLUTION STANDARDIZATION STRATEGY (2021–2025)

1. PREAMBLE

The Fourth Industrial Revolution is heralding the development of new techniques and business models. These will fundamentally transform production processes, government decisions, industry, and the society at large. Trust, policy networks, learning by doing, and collaboration between different social actors are critical success factors. They are also areas of greatest challenge for African countries that are generally characterized by high levels of inequality, low trust between social actors, centralized government, industry concentration and higher costs of search, discovery and failure. Despite these challenges and uncertainties, opportunities abound for African countries to work with global and regional standardization experts such as African Organisation for Standardisation (ARSO) and IEEE Standards Association (IEEE SA) on the development of effective standardization strategies. These can lead to improved economies of production, better planning, and effective control and reduced production costs, leading to higher returns on investment (profit).

The Institute of Electrical and Electronics Engineers Standards Association (IEEE SA), a global voluntary standards development organization, and the African Organization for Standardization (ARSO), a pan-African standards development organization under the auspices of the African Union, are organizations that both develop standards relevant to the Fourth Industrial Revolution, otherwise known as 4IR. The principal mandate of ARSO is to harmonize African Standards and conformity assessment procedures in order to reduce technical barriers to trade to enhance intra-African and international trade as well as industrialization and integration in Africa.

This project aims to identify standardization strategies and gaps through institutional coordination of the African Standardization Strategy for the Fourth Industrial Revolution.

2. ACRONYMS

Acronyms used in this paper are as follows:

AfFCTA	Africa Continental Free Trade Area
A4IR	African Standardization Strategy for the 4th Industrial Revolution Industry Connections Program
A4IRSS	A4IR Standardization Strategy
AECDI	African e-Commerce Development International
AfDec	African Declaration on Internet Rights and Freedoms
AfCFTA	Africa Continental Free Trade Agreement

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AFSEC	African Electrotechnical Standardization Commission
AI	artificial intelligence
ARSO	African Organisation for Standardisation
AUDA-NEPAD	African Union Development Agency–New Partnership for Africa's Development
CSIR	Council for Scientific and Industrial Research
CSOs	civil society organizations
DeKUT	Dedan Kimathi University of Technology
A4IR	Africa Fourth Industrial Revolution
IoT	Internet of Things
IIoT	Industrial Internet of Things
IEEE SA	Institute of Electrical and Electronics Engineers Standards Association
SO	strategic objective
ToC	Theory of Change
SAZ	Standards Association of Zimbabwe
UNECA	United Nations Economic Commission for Africa

3. SCOPE AND APPROACH

The Standardization Strategy adopts a Theory of Change (ToC) approach. The ToC identifies activities that should be undertaken by the project that would contribute to a chain of results leading to improved approaches and coordination of standardization in the 4IR in Africa. The strategy, which is designed to be widely recognized and adopted due to its recognition of change as non-linear requiring review, reflection and revision of strategy, was developed through the coordinated efforts of the A4IR participants. These represent standards organizations, standards development contributors, research organizations, regulatory agencies, technology producers, and software developers committed to empowering societies. Through the process, all participants expressed commitment to developing the standardization strategy in an open, balanced and transparent manner, leveraging the IEEE SA Industry Connections platform. The result is a document that represents the shared vision and aspirations of a broad cross-section of standards stakeholders reflecting the diversity of the face of Africa.

4. PURPOSE

The A4IRSS provides direction for Africa's leadership at national, regional and continental level on how best to use standardization to advance the interests and well-being of Africans in the global economy. It is based on the following considerations:

- Positioning technical standards as a key driver and enabler of all economic activities relating to cyber-physical systems
- Developing a conducive environment in Africa for standards development, taking into account the diversity, interests and expertise available

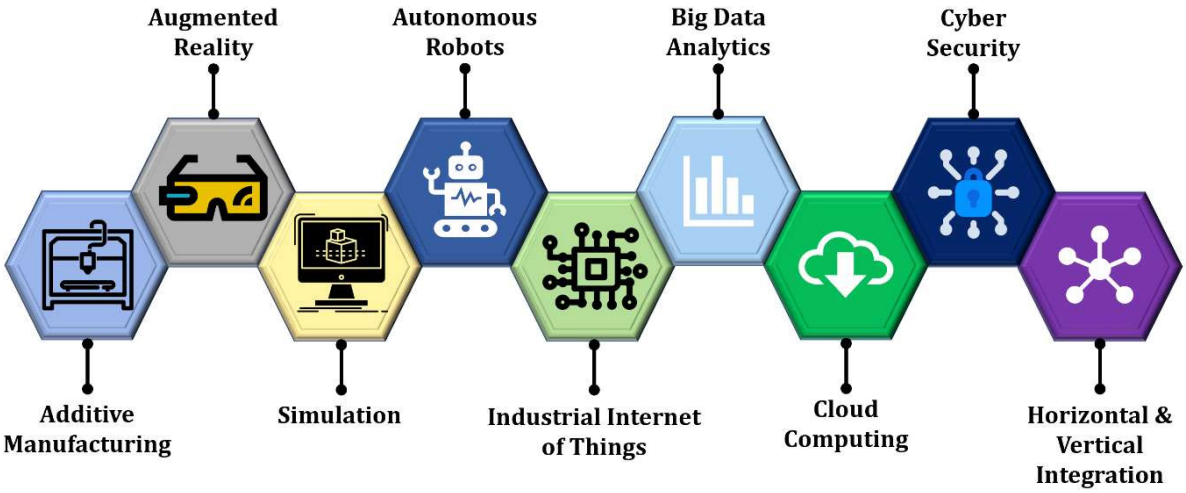
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- Using standards as an enabler of competitiveness of African goods and services in domestic and international markets
- Adopting best practices and innovation in standardization, conformity assessment and technical regulations
- Creating integrated infrastructure, roadmaps and institutions for effective management and coordination of standardization
- Playing an active role in taking up leadership positions internationally or in related areas
- Aligning the A4IRSS with other regional and national policies related to industry, consumers and environment
- Offering the A4IRSS to stakeholders on the continent to facilitate coordination and scaling in context of the Africa Continental Free Trade Agreement (AfCFTA), and for regulatory and policy stakeholders to be able to more efficiently access relevant standardization information

5. DEFINING A4IR.

WHAT IS THE 4TH INDUSTRIAL REVOLUTION?

The terminology 'Fourth Industrial Revolution' is more recently evolved, but its enabling technologies, which are shown in FIGURE 1, have been around for decades and have massively benefitted several industries. 4IR is characterized by cyber-physical systems (CPS) that allow for the merging of real and virtual worlds in real time.



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FIGURE 1 Enabling technologies of the Fourth Industrial Revolution

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