SADC/CM/2/2023/5.2.3B

The SADC Digital Transformation Strategy and Action Plan

(SADC-DTS)

12th October 2022

Table of content

Table of figures

Acronyms and abbreviations

4IR	Fourth Industrial Revolution
AI	Artificial Intelligence
AR4D	Agriculture and Research for Development
ATU	African Telecommunications Union
AU	African Union
BB	Broadband
CBM	Coordinated Border Management
CDN	Content Delivery Network
CESA	Continental Education Strategy for Africa
CIRT	Computer Incident Response Team
CoE	Centre of Excellence
CRASA	Communications Regulators' Association of Southern Africa
DE4A	The Digital Economy for Africa
DFIs	Development Finance Institutions
DG	Digital Government
DIH	Digital Innovation Hubs
DTS	Digital Transformation Strategy
EC	European Commission
eCoO	e-Certificate of Origin
EIA	Environmental Impact Assessment
EU	European Union
FAP	Frequency Allocation Plan
GDPR	General Data Protection Regulation
ICT	Information, communication, and technology
IFIs	International Financial Institutions
IIAG	Ibrahim Index of African Governance
ITU	International Telecommunication Union
IXP	Internet Exchange Point
KPIs	Key Performance Indicators
MFF	Multiannual Financial Framework
MISA	Media Institute of Southern Africa
MS	Member States
MSME	Micro, Small & Medium Enterprises
MSP	Marine Spatial Planning
NETP	Model National Emergency Telecommunications Plan
NEWS	National Early Warning Systems
NREN	National Research and Education Network
NSA	Non-State Actors
ODL	Open Distance Learning
PASET	Partnership for skills in Applied Sciences, Engineering and Technology
RAP	Regional Agricultural Policy
RHIS	Regional health information system
RISDP	Regional Indicative Strategic Development Plan
RSA	Republic of South Africa
SADC	Southern African Development Community
SAPOA	Southern Africa Postal Operators Association

SARIMA	Southern African Research & Innovation Management Association
SATA	Southern Africa Telecommunications Association
SEA	Strategic Environmental Assessment
SME	Small & Medium Enterprises
STEM	Science, Technology, Engineering, and Mathematics
STI	Science, Technology and Innovation
STISA	Science, Technology and Innovation Strategy for Africa
TA	Technical Assistance
TVET	Technical and vocational education and training
UNESCO	United Nations Educational, Scientific and Cultural Organization
WEF	World Economic Forum
WISET	Women in Science, Engineering and Technology

1 SADC Digital DTS policy alignments and related frameworks

Digitalisation has been recognised as a critical enabler for the achievement of the 2030 Agenda for Sustainable Development and Sustainable Development Goals (SDGs). The potential of digital technologies to address social challenges is far-reaching, from facilitating e-skills development and job creation in new sectors to modernising state structures. High-performance computing, big data analytics, blockchain and artificial intelligence can shape fairer globalisation and help achieve policy goals more effectively and efficiently. The COVID-19 pandemic has highlighted the importance of digital technologies and skills, high-quality infrastructure and equitable connectivity as key tools to sustain social and economic activity. Concomitantly, digital transformation presents pressing challenges and risks, including cybersecurity hazards, e-waste production, unregulated markets, and geopolitical tensions.

A successful implementation of the Digital Transformation process in the SADC region will be a key enabler in achieving all of **SADC's Vision 2050 pillars** and foundations.

This SADC Digital Transformation Strategy also aims to achieve or enable the achievement of key goals of the **United Nations' 2030 Agenda for Sustainable Development**, and the **African Union's (AU) Agenda 2063**. The AU Digital Transformation itself strategy is aligned with the UN Broadband Commission Action Plan for universal broadband connectivity in Africa, combining investment needs, sector reforms and demand stimulation required to advance to a Single Digital Market on the continent[9], and the work of the EU-AU Digital Economy Task Force[10].

The SADC Digital Transformation Strategy (DTS), supports the **Strategic Objectives and Outcomes of the SADC Regional Indicative Strategic Development Plan (RISDP)** 2020-30, that is for the region to become an industrialised regional economy, based on a competitive and enabling environment, which includes infrastructure and skills, and sustainably exploits its natural resources by leveraging science, technology and innovation.

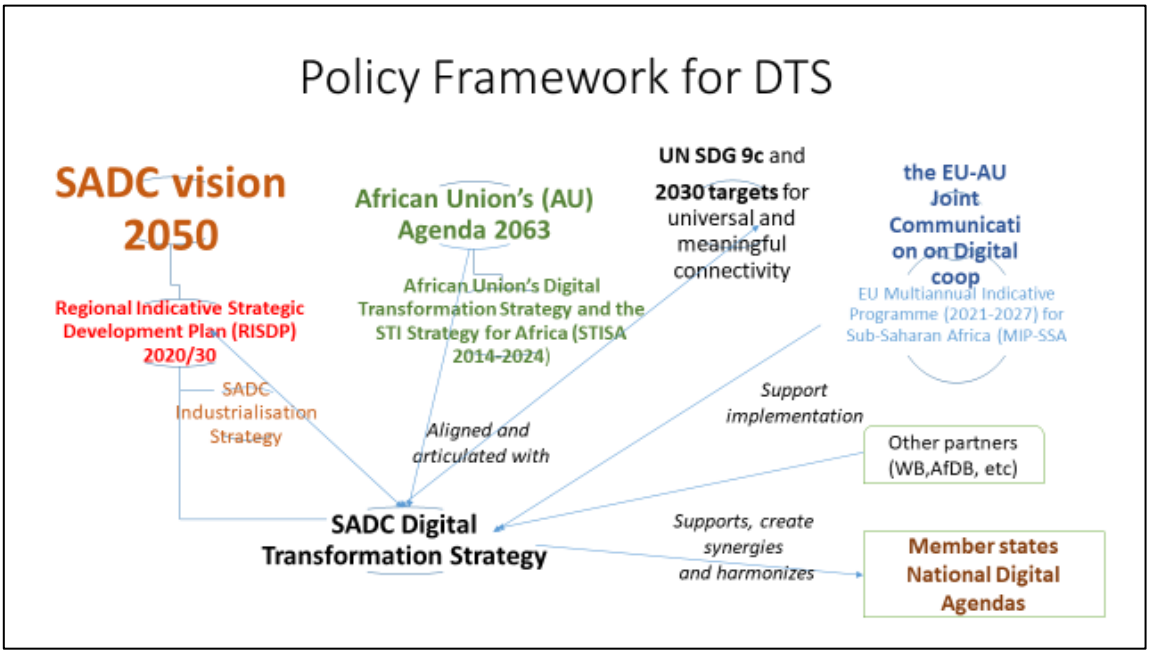

Figure 1: DTS policy alignments

The DTS implementation will be **articulated and implanted in synergy with the African Union Digital Transformation Strategy (AU-DTS 2030)** and the Science Technology and

Innovation (STI) Strategy for Africa (STISA 2024), along with other initiatives SADC Member States initiatives (i.e., COMESA's Enabling Environment in the ICT sector - EGEE-ICT – program, …)

The SADC Digital Transformation Strategy (DTS) supports the implementation of the **SADC Industrialisation Strategy and Action Plan**, contributing to each of its three core strategic pillars – industrialisation as a champion of economic transformation, enhancement of the region's competitiveness, and deeper regional integration.

1.1 The SADC Regional Indicative Strategic Development Plan (RISDP 2020-30)

The South African Development Community (SADC) has developed the SADC Regional Indicative Strategic Development Plan (RISDP), which promotes a regional industrialised economy that is based on a competitive and facilitative environment. To achieve the RISDP's strategic objectives, the SADC region will need to go through a complete digital transformation process that touches upon all relevant sectors and priority areas of intervention. Those priority areas of intervention will accelerate the impact of the digital transformation on society, thus creating more jobs, increasing people's incomes leading to increased economic activity and a thriving digital economy. Nevertheless, while it is important to get the momentum of digital transformation importance, it is still crucial to build strong digital governance including a regional legal and regulatory framework on data protection and privacy.

The Regional Indicative Strategic Development Plan (RISDP) 2020-30 includes in its action plan outcomes, outputs and KPIs that are related to, or should be articulated with and enabled by, the DTS.

Under the strategic foundation pillar, and its **objective 1** "*enhanced conflict prevention, management, and resolution systems, with early warning systems that are capable of tracking and monitoring political, security and socio-economic threats*", **the outcome** of "*enhanced early warning systems, leading to timely and targeted monitoring and response to political, security and socio-economic threats*" is grounded on hypothesis such as:

- by 2025 all Member States conducted an assessment of connectivity of a secure communication network.
- **SADC Cybersecurity response coordination capacity** is strengthened and by 2023 adopted to a methodology for countering the exploitation of ICT platforms to recruit and operate within digital global environments
- by 2025 all **MS to have domesticated the SADC Computer Crime Model Laws** i.e., Computer Crime and Cyber Crime; Data Protection; and Electronic Transactions and Electronic Commerce Model Laws.
- **technologies are promoted and adopted in the design of infrastructure and mechanisms for early warning** and response centres in the Member States, with at least 4 Member States having new and functional Early Warning technologies assessed by 2025
- that **Misuse of Social Media Fake News** are regulated, and that policy Guidelines on addressing the misuse of social media fake news endorsed and implemented by 2023.

The **RISDP Pillar 1** (industrial development and market integration) under its **strategic objective 1** ("*an industrialised regional economy that is based on a competitive and facilitative environment, which includes infrastructure, and skills and sustainably exploits its natural resources by leveraging science, technology and innovation*"), includes the outcome of "*enhanced regional technological capability and capacity through Science Technology and Innovation*", directly related to the DTS scope, and grounded on hypothesis such as:

- **Protocol on Science Technology and Innovation (STI)** implemented and monitored, reviewed and updated to reflect the contemporary landscape and future trajectory prepared in line with Agenda 2063 and SDGs on STI. Science, Technology and Innovation Policy reviews conducted and Member States' capacities strengthened.
- **Regional Innovation and Technology Transfer** instruments and programmes developed and implemented
- Innovation and technology support programmes developed in **support of the MSME sector in the region with at least 3 innovation and technology** support programmes developed in support of the MSME sector (including start-ups) in the region by 2030
- **Regional Industrial Centres of Excellence** strengthened, identified, and established in priority value chains in support of industrial development (at least 5 by 2030
- At least 3 strategic **partnerships brokered in innovation, technology transfer** and commercialisation between academia, research institutions and the private sector in supporting improved competitiveness and business sophistication by 2026
- One regional **Model Framework to enhance capacities and skills in emerging and advanced technologies** developed and implemented by 2030 and at least one Regional Model Framework and Guidelines on STEMI awareness and advocacy developed and implemented by 2030
- **SADC Women in Science, Engineering and Technology** Organisation established and operational and at least 5 more Member States sign the Charter on Women in Science, Engineering and Technology (WISET) by 2024
- **Regional Intellectual Property** (Intellectual Property) Framework implemented through regional support programmes
- **Regional Strategy on the Fourth Industrial Revolution** that takes into account the "SADC 2018 Declaration on the 4th Industrial Revolution" developed and implemented.
- **Regional Framework on Emerging Technologies** developed (at least one by 2025) and at least 5 programmes developed and implemented in emerging technologies to support industrial development by 2030
- **SADC Big Data Framework** document in place by 2026 and implemented by 2030
- **SADC Digital Economy Strategy** developed and implemented to accelerate the SADC Digital Agenda by 2030
- **A Regional Model Framework and Guideline for conducting Research and Development and Innovation Surveys** developed and approved by 2024, at least 3 regional reports produced on STI performance and percentage of GDP investment in Research and Development by 2030 and at least 5 regional capacity building and peer review exchange programmes on R&D and Innovation Surveys implemented by 2030

Under **the strategic objective** 2 related to the agricultural sector, there are obvious digitally enabled outputs such as:

- Regional Agricultural Policy (RAP) **Knowledge management tools** developed and information shared with stakeholders by 2025
- Regional and **National Early Warning Systems** (NEWS) for Food Security (FS) strengthened
- **Improved Transfers of Technologies** and Information by 2026 to increase Crop Production and Productivity in the Region
- Use of **research information and technologies** for increased production, productivity and competitiveness promoted, technology
- **Innovations and Management** Practices developed & promoted by Agriculture and Research for Development (AR4D) institutions for increased production and productivity and climate change resilience and nutrition-sensitive agriculture by 2030, and **Knowledge management hubs** to foster **collaboration & information sharing** among stakeholders created by 2025

- **Agriculture market information** available both at regional and national levels through the SADC aims by 2026 to improve the competitiveness of Agricultural products enhanced to meet regional and international standards and so improve and widen market access for SADC agricultural products

The RISDP strategic **objective 3 is related to interconnected, integrated, competitive Blue, Green, and Circular Economies** in the SADC region, also needs digital foundations to achieve its outcomes and outputs such as the promotion of a resource-efficient, environmentally sustainable, low-carbon development path and equitable society promoted, the effective management of solid and liquid waste, the sustainable use and exploitation of blue economy resources and the sustainable production, consumption and resource efficiency, that are at the hearth of the concept of the twin (green and digital) transition and challenge.

The **Strategic objective 4, which is to deepen the regional market** - connected to the continental and global markets – includes outcomes and outputs that need solid, reliable, and secure digital infrastructures, and readiness for its use such as for the implementation of the SADC **Coordinated Border Management** (CBM), the automation and integration of Customs systems and processes (including the **SADC e-Certificate of Origin** (eCoO) framework to be implemented to at least 6 Member States by 2025. Also, digital connectivity and systems interoperability will be needed for the **Trade Information portal**, the **customs Single Window** Framework, and the system for joint information sharing between importers and exporters from the different regions that have to be developed by 2026. The outcome related to increased Trade in Services in the SADC, which includes harmonized regulatory frameworks for trade in services adopted and implemented by 2023, should include **digital services** with the perspective of a **regional digital single market**.

The **pillar 2 of the RISDP** (*infrastructure development in support of regional integration*) is the natural "host" of this DTS, as it **includes the outcome** "*integrated and interconnected regional infrastructure and networks that facilitate the movement of people, goods, services and knowledge*" and the following KPIs:

- **SADC Digital Inclusion for All Framework** (SADC Universal Connectivity) developed and in place by 2025 and SADC **Big Data Framework** in place by 2026
- SADC Regional Computer Incident Response Team (CIRT) framework operationalised by 2025
- SADC **Harmonised Cyber Security Legal Framework** reviewed, updated and in place and capacity strengthened by 2026
- SADC Model National Emergency Telecommunications Plan (NETP) developed and in place by 2027
- SADC **Frequency Allocation Plan (FAP) and Numbering Plan** for Emergency Services harmonised in at least 10 MS by 2030
- "broadened competitive regional markets that are diverse and responsive to the needs of the SADC region"
- A **cost-based pricing for roaming** wholesale and retail tariffs for voice, data and SMS within SADC implemented with at least 10 Member States by 2027
- Level of **competition in the ICT sector** in all Member States assessed by 2030
- **SADC ICT Observatory** established and operationalised by 2028

Under the same pillar, **the strategic objective 2** (*"improved capacity for conceptualizing, design construction, maintenance and operation of regional infrastructure and service"*) instruments the establishment of the **SADC ICT Centre of Excellence** to be put in place by 2028. This will require a national and regional early warning system improved with the support of modern communication technology and new remote sensing infrastructure, with a **national and regional multi-hazard early warning system** operational by 2030, and a **regional**

framework on the maintenance of public infrastructure, **facilities and equipment** domesticated by 2028.

This strategic objective also includes the **enhanced capacity to develop, operate and maintain the requisite regional infrastructure and services to ensure progressive sustainability**, mentioning, in particular: **the establishment, capacitation and strengthening of regional subsidiary organisations for the ICT sector**, among other sectors; the development and implementation of **a Regional framework to promote the private sector and MSME involvement in the construction, maintenance and operation of regional infrastructure**, in be put in place by 2029;

Under the **strategic objective** 3 ("*increased access to affordable infrastructure and services*") are mentioned key digitally related projects such as the **SADC regional geo-stationary orbit satellite communications network** developed and operationalised by 2028, the framework and guidelines for a **regional data centre** developed and operationalised also by 2028, the SADC **postal e-commerce roadmap** and regulatory framework in place by 2025 and the development of **Regional Cost reflective electricity tariffs with innovative pro-poor electrification support strategy and subsidy mechanism** with a Regional Strategy and Subsidy Mechanism in place by 2025, as a key enabler of digital adoption

The RISDP, **under its pillar 3** (social and human capital development) and its **strategic objective 1** related to health systems includes a **Regional health information system (RHIS)** for data collection and reporting on indicators of regional and continental commitment to be established by 2025. The **strategic objective 3** (increased access to quality and relevant education and skills development, including in science and technology) includes **strategies for Open Distance Learning** to promote greater access to education at all levels developed and implemented, which should be resulting in 16 Member States with National Policy for Open Distance Learning (ODL) by 2030 and a **Regional Education Management Information System** established to report Yearly Progress Report by the Member States on SDG 4, CESA and STISA targets by 2030. It also includes the development and implementation of **Regional Guidelines Mainstreaming Education for sustainable development and universal access to education, especially by young women and girls,** developed and implemented which should be integrated into School Curriculum, ensuring equal access by young women and girls, by 2028.

It also includes the output of a **SADC Virtual University of Transformation** (SUT) with 6 centres of specialisation and Centres of Excellence to be identified by 2027, and a **regional essential digital skills framework** developed and implemented, within a regional **essential digital skills framework to be in place by 2025.** This strategic pillar aims that all **16 Member States are implementing policies to enhance citizens' digital skills by 2030.**

Under the **strategic objective 4** related to job creation and decent work opportunities, it is included the output "**SADC Labour Market Database"** to be developed, with 16 Member States having functional **labour market information systems by 2027.** The **strategic objective 5** related to the **promotion of sustainable cities** in the region embeds the **concept of smart cities** for strengthened urban planning and management to build climate-resilient cities.

Under the RISDP cross-cutting issues **strategic objective 2** (for a robust and responsive regional statistical system), is forecasted **the ICT-enabled regional statistical data production and dissemination** output, which targets that 16 Member States will be using **standardised ICT data-secured technology for transmission** and dissemination of statistics by 2026

Digital is also transversal to many other keys aspects of the RISP including improved **youth empowerment and participation**, **gender equality**, women empowerment and

development and **elimination of gender-based violence (online** and offline), **climate change** adaptation and mitigation, **sustainable utilisation and management of the environment** and natural resources, **disaster risk management** in support of regional resilience, etc. Some outputs and KPIs, that mention directly digital tools use a r**egional disaster risk management information exchange platform/Centre of Excellence** in place by 2028, the mechanisms for identification, assessment and monitoring of **disaster risks, including data and information management** developed and implemented in 16 Member States with operational Disaster Loss and Damage Databases by 2030, the **sustainable utilisation and management** of the environment and natural resources promoted and the regional Guidelines/Standards on Strategic Environmental Assessment (SEA), Marine Spatial Planning (MSP) and Environmental Impact Assessment (EIA) in place by 2027, that will require a huge amount **of data computing and digital imagery processing capacities.**

1.2 Predecessors of SADC digital strategy

The framework developed for the Regional Infrastructure Development Master Plan[1] (RIMDP 2012), prepared for a "digital SADC by 2027" vision, defines four strategic pillars (a) infrastructure; (b) e-services and applications; (c) research, innovation and industry development; and (d) capacity building and content, and two transversal platforms, (1) the confidence and security of networks and services; and (2) policy and regulatory harmonisation, as depicted in the graph below.

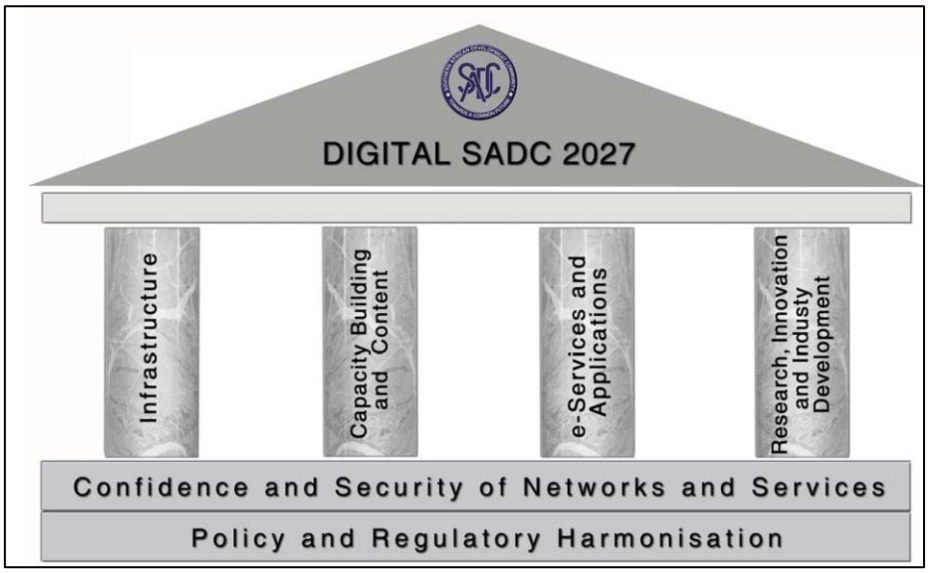

Figure 2: RIMDP (2012) strategic framework for a Digital SADC in 2027

The RIMSP document includes analysis and data concerning:

- Internet penetration/ users, households with Internet Access, fixed and mobile broadband penetration and their trends, fixed line penetration, WiMax deployments
- Number of mobile operators per country and telecommunications Licensing Status (Service and Technology Neutrality)
- Total International Bandwidth and undersea fibre routes, Mainland Interconnectivity Fibre and Microwave Telecommunication Infrastructure – a cross Border Interconnection

[1] https://www.sadc.int/files/7513/5293/3530/Regional_Infrastructure_Development_Master_Plan_Executive_Summary.pdf

Matrix, SADC - list of operators exchanging traffic directly with each other in the SADC mainland

- ASNs in the SADC Member States, ICT Infrastructure Status of SADC Postal Operators
- Internet Protocol (IP) addresses per capita in the SADC Region, Number of Domain Names registered in the SADC Member States, Facebook user penetration in the SADC Member States
- ICT Price Basket for SADC Region, Price of a One-minute Local Call, Mobile Cellular SMS Services, Fixed line international call tariffs per minute in the SADC Member States, Mobile incoming international call tariffs per minute in the SADC Member States
- National ICT Strategies review
- Infrastructure Requirements Projections and Trends for 2027

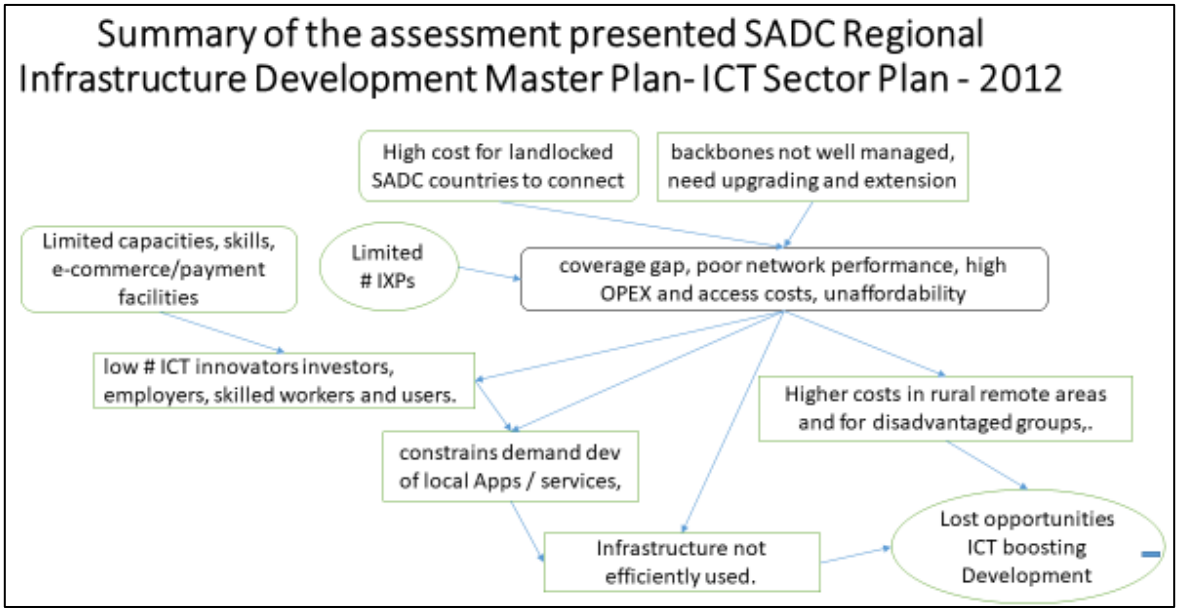

Figure 3: SADC RIDMP ICT sector plan - summary assessment 2012

The figure above summarises the assessment presented to develop the 2012 ICT sector plan within the framework of the SADC RIDMP.

In 2015, the Southern African Development Community (SADC) agreed to a Roadmap for Universal Broadband Access Implementation, which sought to harmonise the pursuit of universal broadband access in the region. Its targets and timeframes were guided by the ITU Connect 2020 Broadband Targets[2]. The roadmap included the following commitments from the SADC Member States:

- Establish National Broadband Plans (NBPs) through the use of the SADC Guidelines on the Development of NBPs (SADC agreed that the Member States should strive to establish their own respective National Broadband Policies and Strategies by 2017)
- Establish the universal broadband access gaps for the SADC Member States and compare them with Connect 2020 targets
- Establish a monitoring and evaluation mechanism for universal broadband access
- Develop SADC Model Broadband Access Policy Statement and Strategic Plan; and
- Include broadband in their Universal Access and Service (UAS) definition

[2] https://www.itu.int/en/ITU-D/LDCs/Pages/Connect-2020-Agenda.aspx

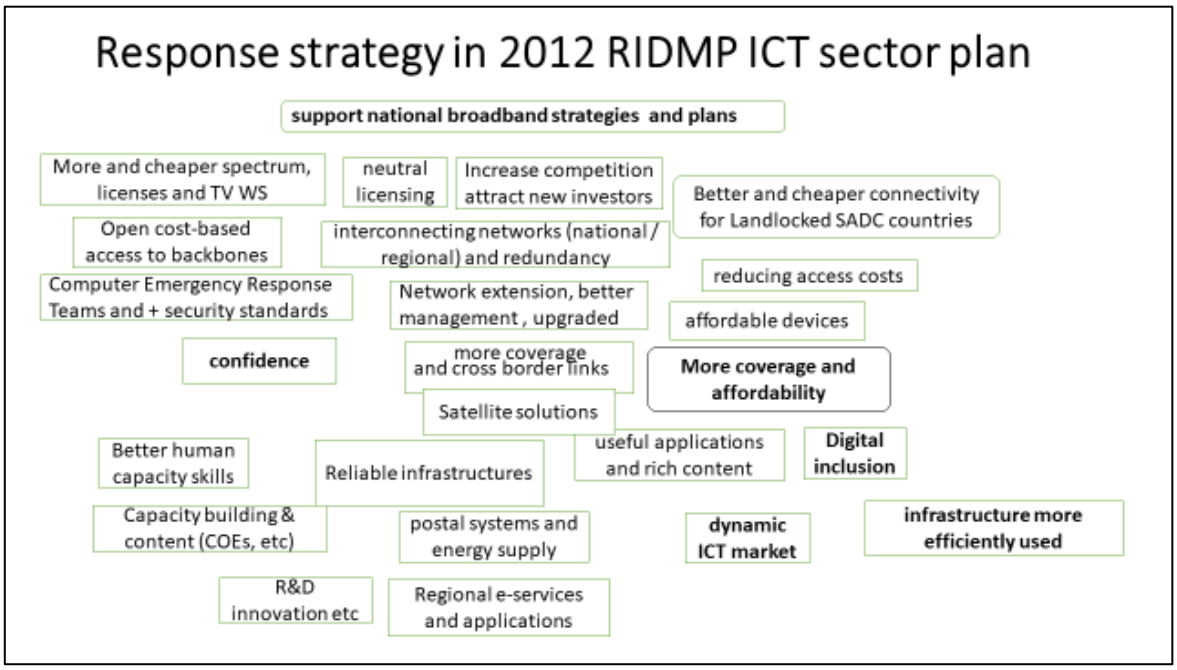

Figure 4: key elements in the 2012 SADC RIDMP ICT plan response strategy

In 2018, SADC Member States agreed to the following broadband targets to be achieved by 2025. These targets are being monitored by CRASA:

Indicator	Target
Population covered by broadband services	80%
Rural areas within the reach of entry-level broadband services fixed or mobile	80%
Households connected to broadband[3]	50%
Entry-level broadband services affordable as % Gross National Income (GNI) per capita	2%
Entry-level terminals and household installation for fixed or mobile broadband, as % of yearly GNI per capita, or less than US$50 (whichever is lower)	2%
Funded National Broadband Plan (NBP) or include broadband in their Universal Access and Service (UAS) definition	all MS
Broadband/Internet user penetration	65%;
Youth and adults with minimum level of proficiency in sustainable digital skills	60%
Un-connectedness of Micro- Small- Medium Sized Enterprise to be reduced by	50%
Population in each SADC Member State should be using digital financial services	40%
Gender equality should be achieved across all SADC Broadband Targets	1:1

Table 2: SADC 2025 Broadband targets agreed upon in 2018

In addition, CRASA, has developed the SADC Rural Broadband Guidelines, and to monitor the extent of its utilisation, it regularly produces reports on the following key pillars:

- Enabling Policy and Regulatory Environment
- Infrastructure
- Funding and Investment
- Access and Digital literacy; and
- Cross-Sector Collaboration

[3] *Broadband definition for SADC was agreed as Internet high access speeds greater than or equal to 1 Megabit per second (1 Mbit/s).*

1.3 African Union Digital Transformation Strategy (AU-DTS 2030)

The African Union (AU) Digital Transformation Strategy (AU-DTS) for Africa[4], adopted in February 2020, aims to "*harness digital technologies and innovation to transform Africa's societies and economies, promote Africa's integration, generate inclusive economic growth and stimulate job creation, break the digital divide, and eradicate poverty for the continent's socio-economic development and ensure Africa's ownership of modern tools of digital management".* Its vision is that of an i*ntegrated and inclusive digital society and economy in Africa that improves the quality of life of Africa's citizens, strengthen the existing economic sector, enable its diversification and development, and ensure continental ownership with Africa as a producer and not only a consumer in the global economy".*

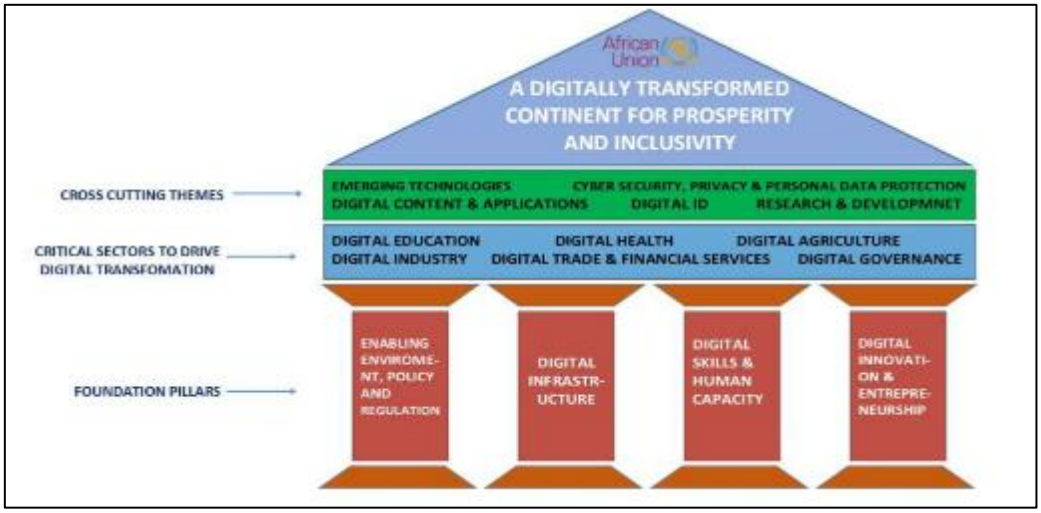

Figure 5: AU Digital Transformation Strategy for Africa pillars

The AU DTS sets out a vision to ensure that every African individual, business, and national government is digitally enabled by 2030, to drive the digital transformation of Africa and ensure the continent's full participation in the global digital economy. The above graphic illustrates the key pillars of the AU DTS, drivers and the enabling layers of digital transformation. These aspects have also guided the analytical framework for the design of the SADC DTS 2023-2030.

The AU DTS specific objectives are

- A secured **Digital Single Market in Africa by 2030** in line with Africa's Continental Free Trade Area (AfCFTA)
- All people should be digitally empowered by 2030 and able to access safely and securely at least (6 mb/s) all the time where ever they live in the continent at an affordable price of no more than (1cts USD per Mb) through a smart device manufactured in the continent at the price of no more than (100 USD) to benefit from all basic e-services and content of which at least 30% is developed and hosted in Africa;
- Setting up a **digital sovereignty fund in order to close the digital infrastructure gap** and achieve an accessible, affordable and secure broadband, across demography, gender, and geography;
- **Harmonize policies, legislations and regulations** and establish and improve digital networks and services

[4] https://au.int/en/documents/20200518/digital-transformation-strategy-africa-2020-2030

- Implement laws, policies and regulations required to stimulate and accelerate digital transformation for national, regional and continental development; coherence of existing and future digital policies and strategies at regional and national levels and mobilize effective cooperation between institutions;
- Entry into force of the **African Union convention on Cyber Security and Personal Data Protection by 2020 and for all Members States** to adopt a complete set of legislation covering e-Transactions, Personal Data Protection and Privacy, Cybercrime and Consumer Protection;
- Promote open standards and interoperability for cross-border trust framework, personal data protection and privacy;
- Create awareness and counterbalance issues of Cyber Security and Personal Data Protection and Privacy;
- Promote the management and use of Country Codes Top Level Domains
- Build **inclusive digital skills and human capacity** across the digital sciences, judiciary, and education, both technical and vocational,
- Offer a **massive online e-skills development program** to provide basic knowledge and skills in security and privacy in digital environment to 100 million Africans a year by 2021 and 300 million per year by 2025. "
- Foster the policies that create an **enabling environment for productive digital trade and digital payment systems to advance opportunities for digital work**, fair competition for digital businesses, and contribute to an advantageous position of Africa in the global digital economy;
- Support **the Agenda 2063 flagship Pan-African "E" programme** by providing policies and strategies that lead to transformative e-applications and services thereby making the digital revolution the basis for service delivery and ultimately transforming Africa into a Digital Society.
- Build a vibrant sector approach to digitalization of the agriculture, health and education sectors
- 99.9% of people in Africa to have a digital legal identity as part of a civil registration process by 2030
- Make African citizens, enlightened and responsible e-citizens.

1.4 UN 2030 targets for universal meaningful connectivity

In January 2016, the 17 Sustainable Development Goals (SDGs) of the 2030 Agenda for Sustainable Development — adopted by world leaders in September 2015 at a historic UN Summit — officially came into force. The Sustainable Development Goals (SDG) 9.c for 2030, is to "significantly increase access to ICT and strive to provide universal and affordable access to internet in LDCs by 2020". It is a subset of SDG 9 that calls for building resilient infrastructure, promoting inclusive and sustainable industrialization and fostering innovation

In April 2022, *'the Office of the United Nations Secretary-General's Envoy on Technology and the International Telecommunication Union (ITU) announced a new set of UN targets for universal and meaningful digital connectivity to be achieved by 2030. These 15 aspirational targets, developed as part of the work of the UN Secretary-General's Roadmap for Digital Cooperation Roundtable Group on Global Connectivity, co-chaired by ITU and UNICEF, prioritise universality, technology and affordability to ensure that everyone can fully benefit from connectivity. The Roadmap had called for establishing a connectivity baseline and targets to aid in advancing a safer, more equitable digital world and a brighter and more prosperous future for all. (…) The new targets are meant to help countries and stakeholders prioritise*

interventions, monitor progress, evaluate policy effectiveness, and galvanise efforts around achieving universal and meaningful connectivity by 2030.[5]*"*

The Universality targets are[6] as follows:

Targets	
Population aged 15+ uses the Internet	100%
Households have Internet access	100%
Businesses use the Internet	100%
Schools are connected to the Internet	100%
Population is covered by a mobile network of the latest technology[7]	100%
Population aged 15+ owns a mobile phone	100%
Population aged 15+ has basic digital skills	>70%
Population aged 15+ has intermediate digital skills	>50%
Gender gap in Internet use, mobile phone ownership and use, digital skills	0 = parity
Fixed-broadband subscriptions 10 Mb/s or faster	100%
Minimum download speed at every school	20 Mb/s
Minimum download speed available per student	50 kb/s
Minimum data allowance for every school	200 GB
Entry-level broadband subscription costs less than 2% of GNI capita	2%
Entry-level broadband subscription costs less than 2% of average income of the bottom 40% of population	2%

Table 3: Universality targets 2030 by ITU

A first assessment of how the world currently stands in relation to the targets will be reported in the Global Connectivity Report starting in 2022.

1.5 EU-AU partnership for digital transformation

A "partnership for digital transformation" is one of the 5 five key partnerships proposed in the Au EU Joint Communication "Towards a comprehensive strategy with Africa"[8]

To implement it the EU Multiannual Indicative Programme (2021-2027) for Sub-Saharan Africa (MIP-SSA)[9] has integrated digital transformation is one of the main priorities. Specifically, the MIP Priority Area 4 is dedicated to Digital and Science, Technology and Innovation but digital is traversal to all the other priority areas related to (1) human development (health, education and skills), (2) governance, peace and security, culture (3): green transition, (climate mitigation and resilience sustainable energy, sustainable agri-food systems, biodiversity and environment) and (5): sustainable growth and decent jobs.

That priority Area 4 reminds that these "efforts will be focused on promoting enabling environments for the uptake of digital tools as well as science, technology and innovation in an integrated approach to the interventions at country and sub-national levels (..)to support the African Union Digital Transformation Strategy and the STI Strategy for Africa (STISA 2014-2024) and operationalise the digital transformation partnership between the two continents".

[5] https://www.itu.int/en/mediacentre/Pages/PR-2022-04-19-UN-targets-universal-meaningful-connectivity.aspx
[6] https://www.itu.int/itu-d/meetings/statistics/umc2030/
[7] *The most advanced technology available in the country with at least 40% of the population already covered*
[8] https://ec.europa.eu/international-partnerships/system/files/communication-eu-africa-strategy-join-2020-4-final_en.pdf
[9] https://ec.europa.eu/international-partnerships/system/files/mip-2021-c2021-9373-sub-saharan-africa-annex_en.pdf

Under this priority area, the specific objective 1 will support an inclusive and human-centric digital transformation in Africa in line with the EU's core values and political vision on digitalisation, by:

- **promoting secure, human-centric and harmonised digital standards, legal and regulatory frameworks** at regional/continental levels, towards integration at continental level. *The programme will promote the deployment of secure, human-centric and harmonised digital standards, legal and regulatory frameworks, including in the field of connectivity, open internet, data (data protection, privacy, data sharing, cross-border data flows), digital services components (such as e-identity, mobile money) cybersecurity (network security, security standards) and emerging technologies (artificial intelligence, internet of things, etc.) towards a continental African Digital Single Market. This will facilitate the exchange of data, support sectoral digital strategies (such as e-health, e-education, e-agriculture), enhance the provision of e-government services and encourage investments.*
- enhancing equitable access to affordable, secure and quality digital infrastructures, both within Africa and between Africa and Europe. *In order to foster inclusive and equitable access to digital tools and services, the programme will seek to reduce the cost and improve quality of connectivity. To this purpose, efforts at unlocking the potential of the existing connectivity infrastructure will be pursued by addressing issues of interoperability between infrastructures, tackling investment hurdles and market distortions and by facilitating the establishment of regional/continental operators with the support of the EU private sector. The programme will support a coordinated and geopolitical approach to investments in new, resilient and secure connectivity infrastructures as well as in advanced regional data infrastructures such as data centres and content delivery networks. attention will be given to the provision of adequate and affordable connectivity to Research and Education Networks and the synergy with other EU-leading initiatives (Galileo, Egnos, Copernicus, etc.). Investments will target multi-country and regional interventions as well as national backbones and internet exchange points, which serve a regional approach, with a focus on connecting underserved countries.*

The AU-EU D4D Hub[10][11], intuitive, launched by the end of 2020 aim is to contribute to closing the digital divide and leveraging digital innovations for inclusive sustainable development in Africa. It is implemented by European Commission, Enabel, GIZ, AFD, and LuxDev (MFA Estonia, ITL, eGA and Expertise France also participate). Its specific objective is to strengthen African national and regional partners' capability to identify and implement priority actions in response to digitalisation challenges. The envisaged outcomes are (1) improved access to broadband internet and digital technologies across the continent (2) enhanced use of digital technologies, particularly for youth, women, vulnerable people, etc. (3) leveraged digital solutions for inclusive, sustainable and green growth, and (4) improved social services through innovation and digitalisation. The AU-EU D4D Hub intervention areas are:

- Technical assistance to increase the capability of regional and national institutions to develop and operationalise digital transformation plans.
- Knowledge sharing (experiences, skills and expertise) between African and European stakeholders.
- Dialogues between actors from the digital ecosystem to support participative policymaking and foster new partnerships.

[10] https://ec.europa.eu/international-partnerships/projects/au-eu-digital-development-d4d-hub-shaping-joint-digital-future_en

[11] The African Union – European Union (AU-EU) Digital for Development (D4D) Hub supports African institutions to lay grounds for an inclusive and sustainable digital transformation that benefits everyone. The project offers a comprehensive package of services, products and activities aimed at creating an enabling environment for Africa to seize digitalisation opportunities. https://d4dhub.eu/au-eu-project

In addition to the NDICI instruments funding allocated to the MIP, for this priority there are proposals of a multi-country/regional Team Europe Initiative ongoing in the AU-EU D4D Hub[12], that looks for *scaling up investments in the digital transformation of partner countries; promoting a comprehensive values-based rulebook for a digital economy and society; and promote a stronger and more strategic EU engagement in international digital partnerships*, and has received intention of contributions from several countries (DE, FR, BE, EE, LU FI, LT, NL, PT, ES, SE).

[12] The African Union – European Union (AU-EU) Digital for Development (D4D) Hub supports African institutions to lay grounds for an inclusive and sustainable digital transformation that benefits everyone. The project offers a comprehensive package of services, products and activities aimed at creating an enabling environment for Africa to seize digitalisation opportunities. https://d4dhub.eu/au-eu-project

2 Challenges, scope and theory of change

2.1 Gaps and challenges for the SADC digital transformation

Previous to the design of this DTS document, a Situational Analysis Report was prepared and validated during a consultation Workshop held virtually from the 14th to 15th July 2022. It identified gaps and challenges to be addressed by the Digital Transformation Strategy, articulating potential national and/or regional strategic responses.

The key gaps for SADC digital transformation identified during the analysis phase, valeted by the consultation workshop and to be considered by this SADC DTS include:

Digital Policy and regulatory gaps

- **Digital Policy gaps:** Many SADC Member States (SADC MS) need to upgrade their national digital transformation agendas, fully aligned with their national development plans, and ensure articulated mainstreaming of digital in their specific sectors' strategies (education, health, other public services, agriculture, SMEs, tourism, culture - developed broadband connectivity plans) with clear time-bound targets, assign budgets, institutional frameworks and resources.
- **Digital agendas implementation gap**: Many SADC countries have had Digital Agenda plans articulated but the level of efficiency in implementation varies, mitigating results. **Inter-institutional coordination, increased human skills are required,** as well as **monitoring of the impact** of digital policies, which are frequently insufficient to produce the desired results.
- **Intra-regional digital development/readiness gaps:** SADC MS are at very different stages of digital development and readiness, and as such, have to address different sets of challenges. Differentiated regional support and programs may be needed to be present in the DTS, so it can address different levels of needs, while still being attractive to all Member States.
- **Legal and ICT regulatory readiness gap**: Gaps that were identified in regulatory frameworks make the case for further regulatory reform towards achieving an inclusive ICT sector in terms of Regulatory Authorities, regulatory mandates, regulatory regimes and data governance frameworks for the ICT sector. Addressing these entails a review of the key technical, legislative, regulatory and legal framework, which will enable accelerated digitalization and ensure the right institutional capacities are in place for regulating the new digital economy and its challenges.
- **Regional regulatory harmonization gaps:** SADC MS need to harmonise intra-regional, digital policies and ICT/data regulations, standards and use common reference frameworks in all aspects of digitalisation.
- **Cybersecurity regulation gap**: Only 3 SADC member states have signed the “Malabo Convention”. This lack of ratification and low adoption may be due to a lack of awareness of the Convention’s benefits and requirements.
- **Data protection gap**: There are growing concerns that in several SADC countries, government agencies and private entities are collecting and processing personal data without adequate data protection frameworks, amidst weak oversight mechanisms and inadequate legal remedies. Not all Member States have Data Protection Regulations in place. SADC Data Protection Model Law is being modernised in line with EU GDPR and other international best practices and needs to be considered by all SADC MS.
- **Consumer protection gap**: Some MS need to upgrade and modernize their Consumer Protection Acts in order to be ready for digital economy challenges.
- **Digital Freedom gap**: SADC Global Freedom status varies within the Member States (MS) but ranges from Free to Partially Free. Internet freedom misses a lot of data input

from SADC MS, while the SADC MS are enacting restrictive cyber laws that have an alarming effect on journalism and freedom of expression.

- **Digital inclusion and closing the Gender Gap:** SADC MS policies need to set targets, means and resources to ensure digital inclusion of low-income, rural populations and close the digital gender gaps. It is also important to strengthen women's empowerment in the ICT sector, industry, STEM etc. by developing initiatives that foster the participation of women and girls.
- **Societal trust in Digital Transformation**: There are many misconceptions and large-scale misinformation about technology systems in societal debates. Technology seems not to be fully accepted by society in all potential application areas.
- **Policy and regulatory uncertainty**: Policy-making and regulation of digital technologies are still unclear in areas such as liability, right to explain, and data access. Many organisations have concerns about compliance as well.
- **Government Interoperability gaps**: Interoperability refers to the ability of different IT systems being able to exchange data, communicate and verify identities. It ensures a common understanding of the exchanged data between systems and across organisations. Most governments have citizens' data in different silos – frequently this data is incomplete and often conflicts.

Connectivity, adoption, affordability, usage gaps

- **Coverage gaps**; Large geographical areas in the Member States, especially rural areas with low population density, still do not have services as it is costly to deploy infrastructure and services. In addition, policies need to ensure service deployment and promote investment in areas that are currently not attractive enough for investors.
- **Usage gaps**: There is a large fraction of the population covered in the SADC (roughly 70%) with possible access to digital services, but 49% of these covered, do not use it. That is due to the high cost of services, lack of affordable devices and basic skills as well as a lack of relevant content and services in local languages, etc. As such, policies should focus on ensuring usage together with coverage.
- **Broadband Affordability gaps**: The high cost of access to data in relation to monthly individual incomes, especially for low-income and/or rural populations is a key barrier. The cost of wholesale capacity and cross-border links for landlocked countries, international peering, and low competition in specific markets were mentioned as some of the structural causes of the high costs affecting overall affordability.
- **Device affordability gap**: The high cost of devices, such as smartphones, in relation to monthly incomes, especially for low-income populations is another key barrier.
- **Meaningful connectivity gap**: A newly developed concept, differentiating the "well connected" and those having access to "basic connection". Member States have to design strategies to ensure that all citizens can make full use of the potential of digital (i.e., access to sufficient data and affordable devices).
- **Infrastructure Investment gap**: In the region, the investment gap of 32 billion US Dollars to ensure universal affordable connectivity (UN targets 2030) can only be covered with large private sector input (90% of the infrastructure investments in capital and operations). For this, the region will need to set up enabling environments and strategies to attract all these needed investments.
- **Access to electricity gap:** Critical gap in particular in rural areas of many Member States, needs to be addressed.
- **Access to Technology:** Access to technology must be coupled with socio-economic welfare. Innovations in healthcare, education, and agriculture must address the pain points of, particularly, the most vulnerable members of society.

Skills and capacities gaps

- **Basic Digital Skills gaps**: There is an important, yet unmeasured, digital skills gap among the general population. Many factors are at play here, as some Member States do not have digital skills policies in place, and others have uncoordinated activities by different actors or incoherent and non-structured ways of implementing digital literacy programmes. Others have inadequate training services for the different population segments (that need to have a specific response as they have varying skills and accessibility levels), or insufficient ICT skills among teachers and learning/teaching capacities; lack of remote learning capabilities (both in the education facilities and the households), and insufficient linkages between government and academia/industry, to provide the basic digital skills that the market demands.
- **Advanced digital skills gap**: Skills penetration is low for most SADC Countries in, for example, Artificial Intelligence, Cloud Computing and other emerging technologies. South Africa is leading in this dimension. The Demand versus Supply Gap in digital skills remains high in SADC countries.
- The **regional industry is not absorbing the many students graduating** from SADC universities and the education system is not **delivering graduates** that the market demands.

Digital industry/sector development gap

- **SADC digital private sector investment environment**: Access to finance for the digital / ICT sector is still lagging behind other parts of the world. Africa needs to create a competitive, forward-looking private investment ecosystem to boost innovation in AI in a fast and focused way. Though the continent is embracing the Fourth Industrial Revolution, access to finance, skills and inclusive growth needs to be improved. On the supply side, Africa is characterised as an adopter of the Fourth Industrial Revolution technologies instead of a net producer, which indicates that the African start-up system is undercapitalized, and needs to build an ecosystem with universities, investors, infrastructure and the right incentive structures to support start-ups.
- **Higher complexity of Digital Transformation in Industry and the Public domain**: Implementing Digital Transformation, AI, data analytics and robotics in industrial and public environments relies on incorporating the domain knowledge of underlying processes. Handling these challenges requires combining domain-specific process knowledge with other scientific knowledge.
- **Barriers to the single digital market**: Developing a single African and SADC digital market requires harmonised digital policies and integration of many sector policies/frameworks (trade, transport skills and competencies, standards, customs, fiscal, financial systems etc) together with digital system integrations.

Research gaps

- **Fragmented Research Landscape**: SADC has research capabilities in academia and public research organizations. However, their activities are fragmented between sub-communities and within the Member States. And there is a lack of strategies to engage the private sector in research.
- Insufficient **funding for R&I** (research and innovation)
- **Inadequate access to research** data as there is very little research output from universities due to non-affordable access to documents and lack of coordination
- **Technological barriers**: There is considerable complexity and cost in creating systems with the ability to collect, process, and analyse large quantities of data to make robust and trustworthy decisions and implement autonomy.

- **Access gap to DT Infrastructure**: Academics and innovators (SMEs and start-ups in particular) require good access to world-class innovation infrastructure, including access to data and resources such as HPC (High-Performance Computing) and test environments, etc.
- **Gender gap in research:** There is a high dropout percentage of women in STEM programs;

SWOT analysis for the DTS

Based on the research prepared for the situational analysis study and regional workshop feedback the following 2 SWOTS (Strengths, Weaknesses, Opportunities, and Threats,) were prepared. The first one is related to the context of digital transformation in the SADC region (DT in the specific context of SADC) and the second one to the SADC DTS implementation.

SWOT for digital transformation in the SADC region	
Strengths ▪ Regional integration dynamic in place (trade, finance, skills etc.) ▪ International connectivity (submarine cables) and regional backbones interconnection are almost complete or ongoing (although costly) ▪ Increase in elementary school access	**Opportunities** ▪ Young population ▪ New business models for the last mile and rural connectivity ▪ New technologies available to fast-forward digitalisation ▪ Private sector interest in investing more ▪ Remote and blended-learning initiatives across the SADC MS leveraged during the pandemic ▪ availability of data, from mobile operators, telecoms providers & (mobile) banks in SADC ▪ Universities in the region have the capacity to support digital development ▪ Big Data, AI, and IoT have great potential to modernize agriculture, education, Tourism and healthcare, four very important sectors in a SADC context ▪ Consumer protection serves as an avenue for promoting transparency, accountability, and trust and it is a cornerstone of free trade
Weaknesses ▪ Coverage gaps, access gaps, digital gender gaps, rural gaps, income gaps, literacy gaps ▪ Incomplete or expensive broadband backbones access ▪ Affordability (internet access and devices) ▪ Electricity access (including rural), ▪ Legal and regulatory gaps and non-regionally harmonized in many areas ▪ Lack of regional harmonization or cross-border systems for payments, cross-border trade, identification and verification for digital transactions. ▪ Basic digital skills gap of the population and advanced skills gaps (AI, Big Data, Cybersecurity, IoT…) ▪ Shortage of finance, mentoring, and training available for high-potential digital entrepreneurs	**Threats** ▪ Crisis and unrest (political and social) ▪ Cyber threats, privacy threats, accelerated by COVID-19 pandemic: ▪ Tech Misuse (tech for social control and limiting rights vs empowering) ▪ Tech divides could be widening gaps (social, economic), including because of AI bias ▪ Sustainability of infrastructures ▪ Perceived lack of trust in open-source technologies

▪ Differences in levels of DTS and Sectorial Technological development in SADC ▪ Limited research ecosystems, innovation gaps - Access to finance gap for innovators ▪ Incapacity of the local and regional industries to absorb the majority of students graduating from SADC universities ▪ 90% of African businesses including SADC are operating without the necessary cybersecurity protocols in place ▪ Limited supervisory capacity to identify and mitigate risks which are exacerbated by digital technologies, including cyber-attacks, fraud (brain drain in STEM and other relevant fields) ▪ Variable levels of open government initiatives and use of open data platforms at national and regional levels ▪ lack of regional/national strategies to regulate foreign tech companies operating across the SADC MS ▪ Inconsistent national policy frameworks to promote STEM education ▪ Market distorting and unclear impact on competition of firms, including small enterprises ▪ Lack of Big Data AI-related research institutes and training opportunities	

SWOT for DTS implementation	
Strengths ▪ Strong vision/policy framework to frame the DTS (SADC vision 2050 and RIDMP) ▪ Digital up in national dev agendas (political will) Momentum is gaining for a digital strategy for SADC ▪ Institutional frameworks for regional coordination in place (i.e., CRASA) ▪ Some building blocks as CoE and ICT Observatory started ▪ African Union Commission (AUC) Agenda The Digital Transformation Strategy for Africa 2020-2030	**Opportunities** ▪ DST see as supportive of SADC vision 2050, RISMP 2030 and regional integration ▪ Digital higher priority of Partners - more interest willing to support DTS (EU, World bank AFDB etc.) ▪ Regional actors (private sector, academia, research, etc.) willing to engage ▪ Existing remote- and blended-learning initiatives, can serve as a basis for the strategy implementation (various education levels) ▪ Emerging continental initiative Artificial Intelligence for Development in Africa (AI4D Africa) program ▪ Synergies with *EGEE-ICT* and other regional projects
▪ **Weaknesses** ▪ Implementing capacities; some good SADC policies but not well implemented ▪ Adoption and domestication of regional model laws and other instruments are optional for MS ▪ Some of the SADC MS have laws without implementing regulations missing (as in cybersecurity) ▪ Cross-sector coordination and articulation (regional and national) within SADC ▪ Capacities for managing regional and national horizontal and vertical integration (articulation cross all sectors and mainstreaming) ▪ Inequalities and inefficiencies in the public education system (which offers the basis for digital literacy) ▪ Difficulties in replicating national-level successful initiatives to the regional level ▪ Lack of reliable and on-time quality data, weak mechanisms for monitoring and evaluating the implementation of the strategy	**Threats** ▪ Competing models of digital (different values, non-human centric) (i.e., China) ▪ Disruptive regional processes (disarticulated) ▪ Crisis that divert resources for urgency vs importance -competing emergencies (food, security, health, energy) ▪ Governments control of data use and political misuse of internet regulations ▪ Uncoordinated activity by the relevant different actors (public bodies, academia & research institutions, International NGOs operating in the MS with tech/entrepreneurship-related programs, foreign tech companies, etc.)

2.2 SADC DTS scope of action and theory of change

Digitalisation is by nature crosscutting to all sectors, and an enabler of efficiency gains and/or systemic change in almost any process, institution, or activity. That is why digitisation policies and strategies, policy makers, project holders and implementers, face the challenge to define and delimit the mandates and responsibilities between those working purely on digital/ICT matters and those in the specific sectors, that will have managed the adoption strategies in their field. This happens at both national and regional levels.

Key choices have to be made as to what extent the DTS implementation stays within the ICT/telecom/Digital area or its management stays within the thematic area, and how can that all be efficiently articulated. The graphic below shows how specific sectors regional plans and the DTS have overlapping areas, emphasizing how key elements of the implementation of regional e/digital-government[13], e-education, e-health, and digital economy might be residing within the DTS **or** within the specific sector responsibilities (*these elements are theoretical, for illustration, not actual SADC plans*).

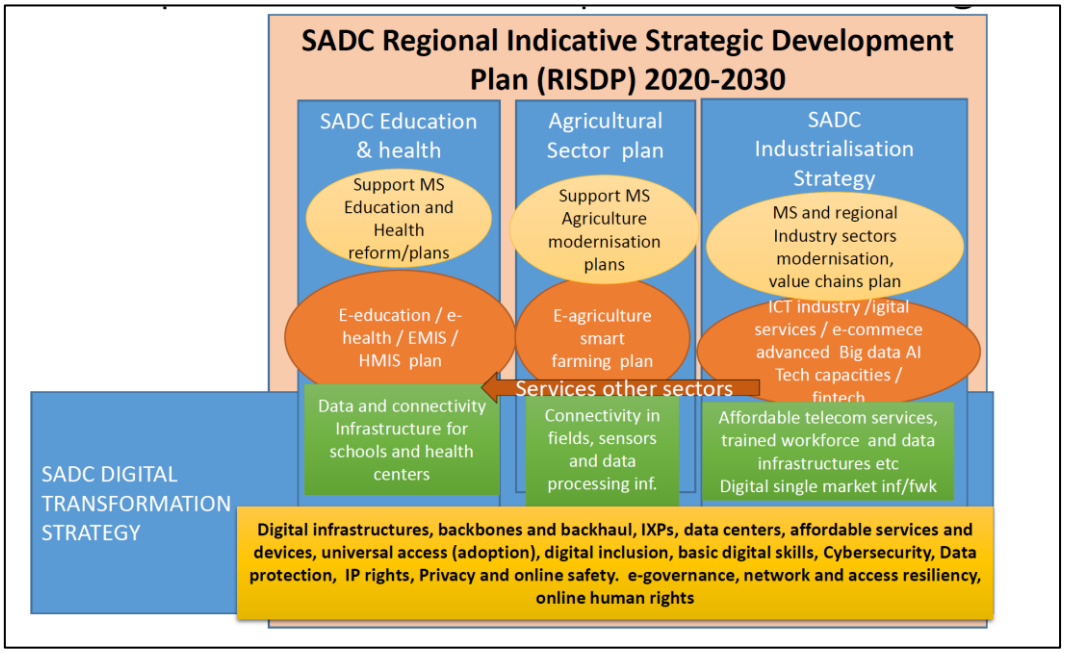

Figure 6: Articulating SADC regional sector vs regional digital strategy (theoretically)

Additionally, the **SADC DTS which is by nature regional** will define shared goals and orientations, but most of the digital transformation **actions will have to be implemented nationally**, in their own specific context, priorities and set up, although regionally articulated and harmonised.

For instance, as illustrated in the graphic below in the case of a SADC MS support program to digitalise education, that would include providing connectivity to schools, digital learning and education management information systems, introducing digital tools in the teaching and

[13] E/DIGI gov Refers to both e-Government and Digital Government. The OECD defines digital government as "the use of digital technologies, as an integrated part of governments' modernisation strategies, to create public value" and that it "relies on a digital government ecosystem which supports the production of and access to data, services and content through interactions with the government." The OECD's definition of e-government is similar: "the use by the governments of information and communication technologies (ICTs), and particularly the Internet, as a tool to achieve better government." WB offers also a wider conceptual differentiation between e-Government and Digital Government here: https://thedocs.worldbank.org/en/doc/805211612215188198-0090022021/original/GovTechGuidanceNote1TheFrontier.pdf

learning, reengineering, teaching/learning processes, teacher training, e-education content, etc. All that should be responding to, and emended in, the specific MS education policies and plans, that are probably already being articulated or supported within the framework of the SADC education sector. The MS e-education plan or strategy itself should also be part of the MS digital agenda.

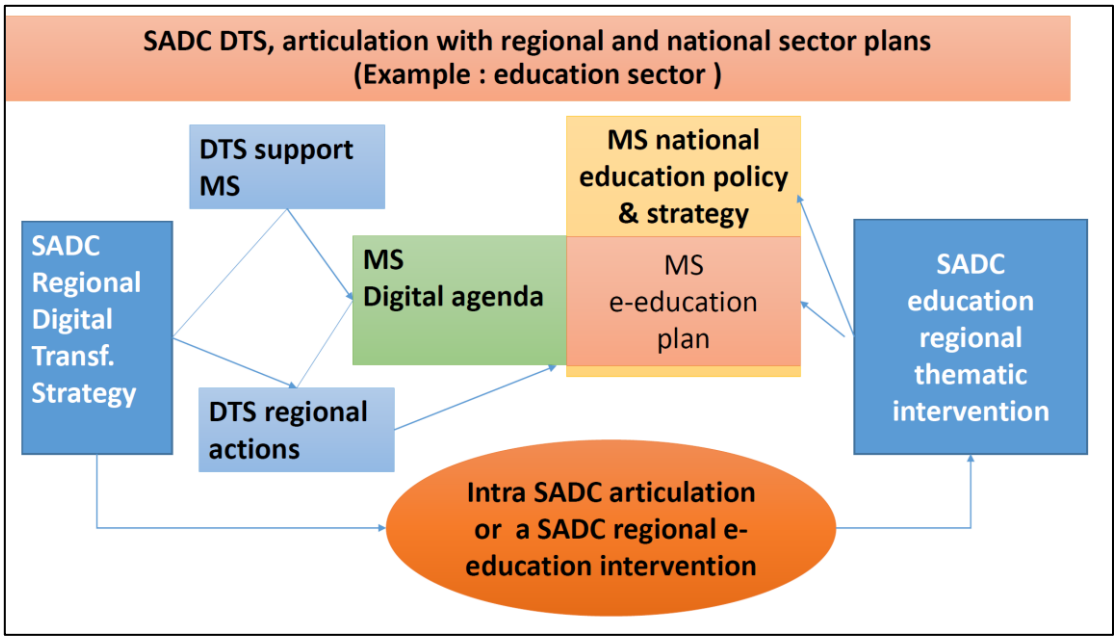

Figure 7: Illustrating the need to articulate sectoral and digital interventions, at both national and regional levels

That requires then both articulating the actions and strategies at the regional SADC level and the national MS level, delimitating areas or responsibility. For example, at the national level if digital/telecom platforms are limited to ensure connectivity services by private operators, schools that are schools are or will be connected, or will also cover the school's connectivity costs? The question of who manages country-wide public schools network infrastructures (e/digi-gov agency together with other e/digital-government services or just the education sector) is also of crucial relevance. At the regional level, is it the Education sector of SADC or DTS that will prepare a program (if needed) to train education content providers or data centres for remote learning?

The other delimitation, between what SADC DTS as a regional intuitive can-do vs the role of national Member States is illustrated in the two graphics below using the example of universal access and connectivity.

SADC DTS steric intervention can be of two dimensions, which will ensure the MS reaches also the regional goals. One is strengthening capacities for designing, implementing and driving effective impact of national policies and plans, and the second is to implement regional support or/and create and manage shared resources (regional commons, shared assets, regional public goods, …).

To strengthen capacities for design implementation and impact of national policies, SADC DTS can design model laws, regulations, pride technical support for domestication. exposure to best practices, sensitisation, awareness to local stakeholders, develop capacity and training, provide TA for national design and implementation support, organise networking and peer exchange, provide monitoring, benchmarking and impact studies

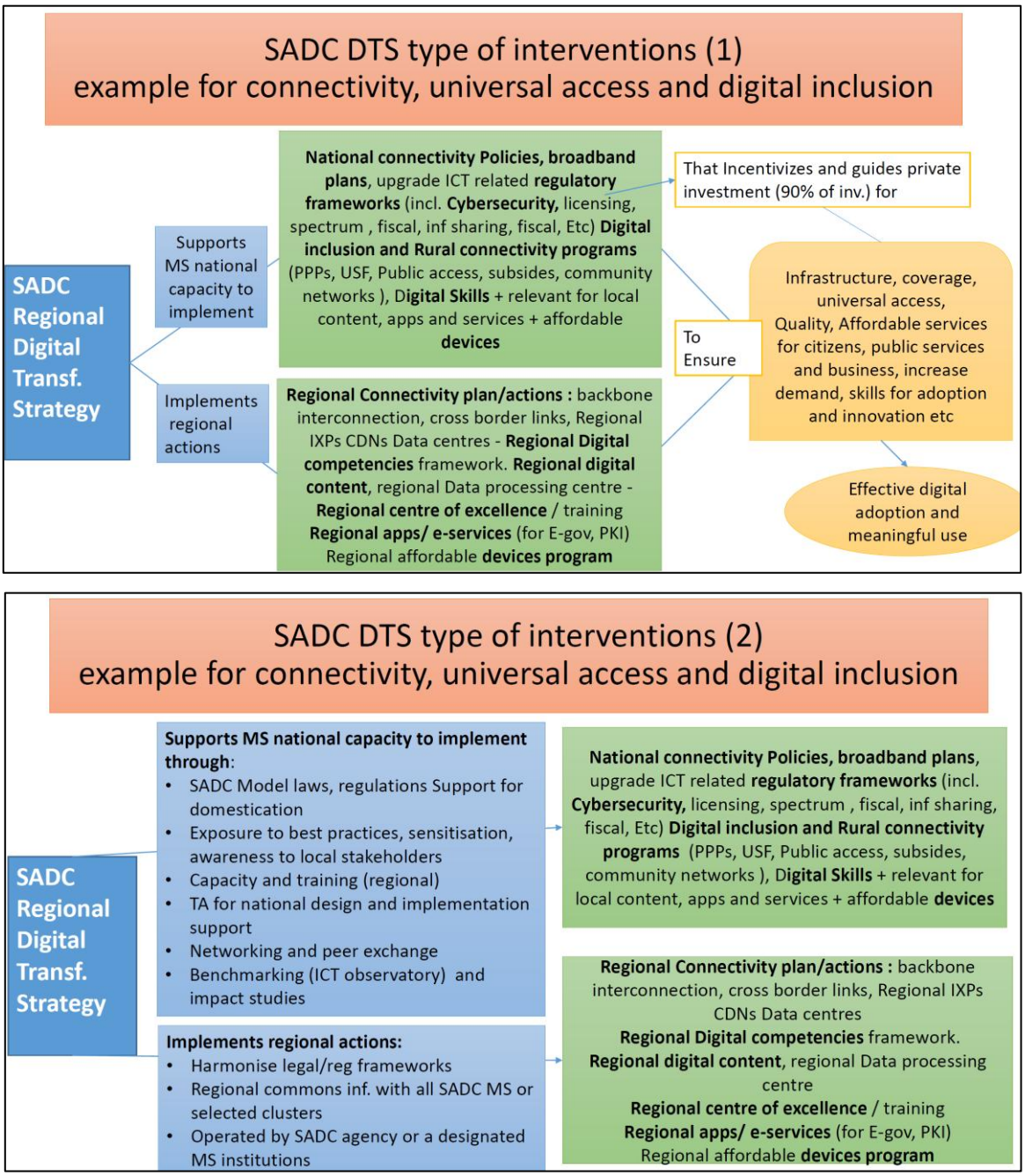

Figure 8: Regional DTS actions and support for national implementations

The SADC DTS approach is to support policy and regulatory upgrades, ensure the capacities to implement these, create some regional shared goods, tools or resources, as shown in the graphic below, tanking for example what it takes to achieve the digitalisation of the economy and the 4IR adaption. Many elements are needed, redundant and solid connectivity infrastructures, affordable services, digitally skilled and connected populations, content and services, enabling legal and regulatory environments, cybersecurity, digital innovation and entrepreneurship ecosystems, advanced technical skills, access to capital finance, effective sector adoption strategies, data infrastructures and services, etc.

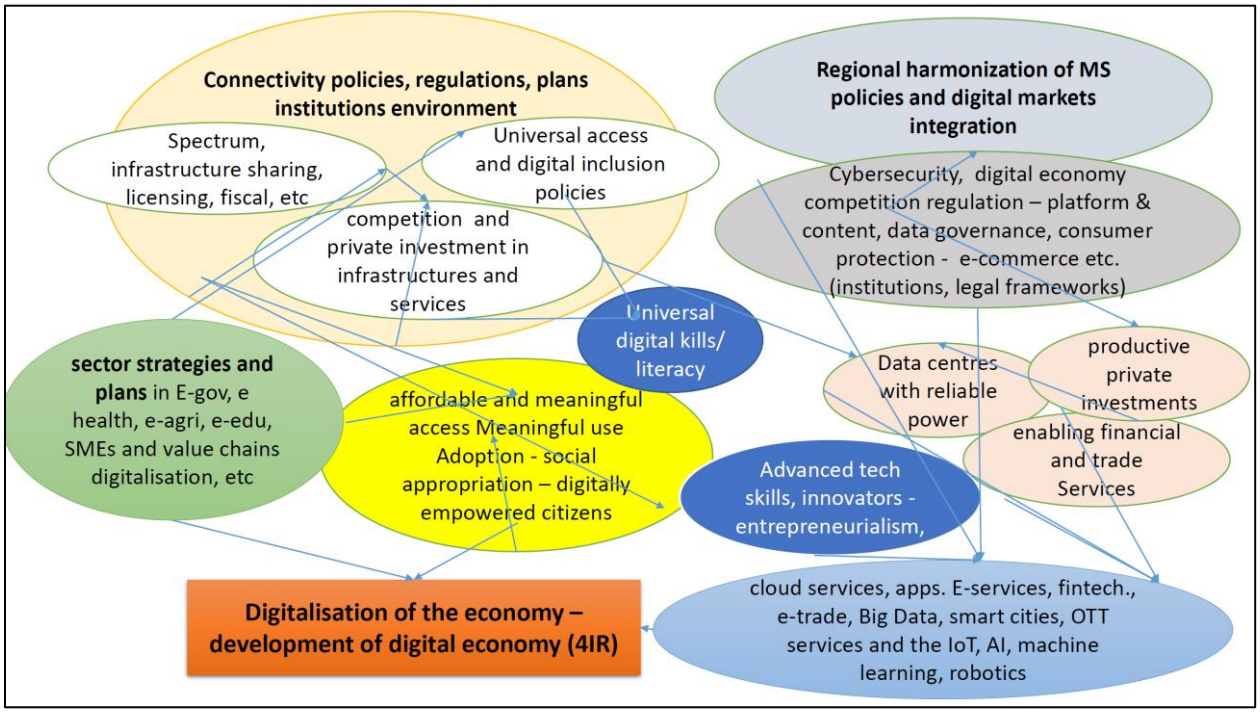

Figure 9: SADC DTS approach – achieving the targets by implementing harmonised, effective and transformative policies, enabling frameworks, and building capacities

Thus, the proposed SADC DTS actions will target:

- supporting the development of good digital policies, e-sector plans and cross-sector articulation (national and regional),
- support upgrading and harmonising legal and regulatory frameworks
- supporting SADC MS institutional capacities, peer learning and cooperation, access to resources for implementation,
- implementing key regional programs

If those actions are well implemented and all stakeholders, regional actors and Member States play their respective roles, that should foster an enabling environment, for the creation of affordable broadband services, quality resilient interconnected backbone networks, cyber secure networks and data systems, modern data and regional e-services infrastructures and advanced ICT services provision, digital skills for all and a critical mass of advanced skills and sound national and regional sector plans implementation (as for e-gov, e-edu, e-agri, 4th IR etc,). That would produce the expected impact, and enable and accompany digital transformation, which can be translated into having achieved universal access and digital inclusion, in effective digital adoption in and by all sectors, citizens, institutions businesses digital empowered and in a strong ICT sector providing digital content and services for all.

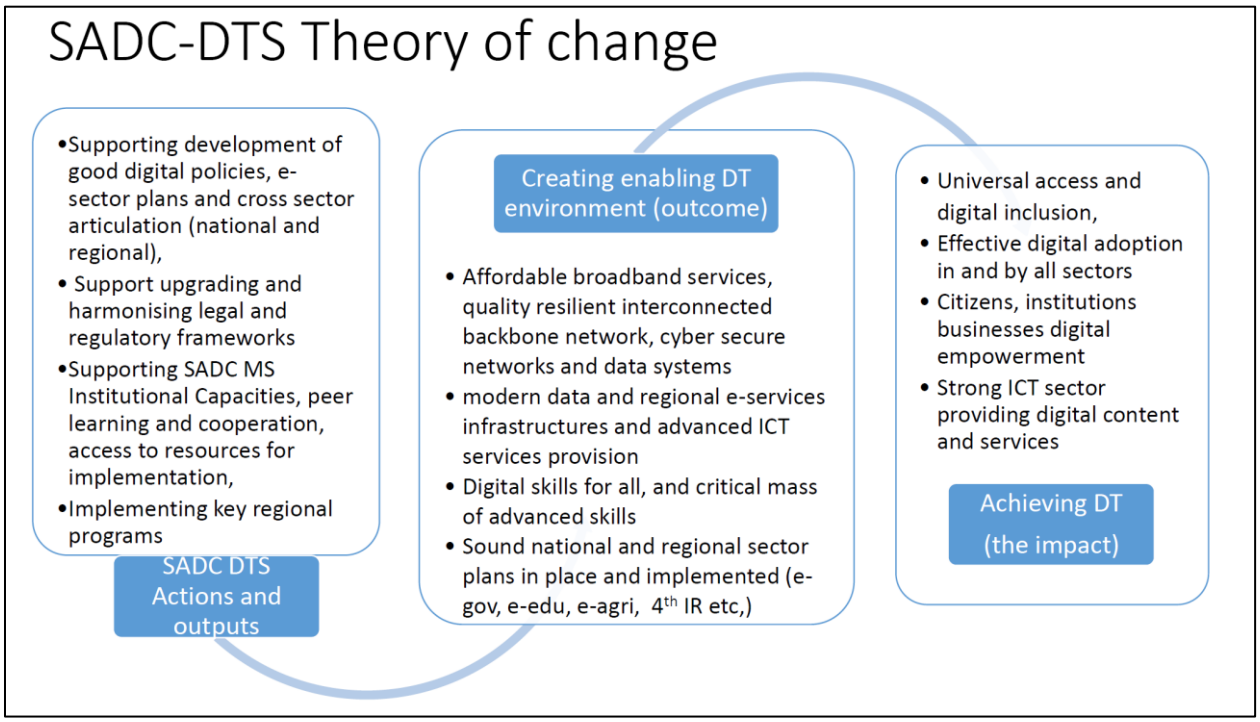

Figure 10: SADC DTS theory of change

3 SADC-DTS goals, objectives and principles

3.1 DTS goals and targets for 2030

The SADC Digital Transformation Strategy goal is to contribute to and enable the achievement of SADC's vision 2050 which is "a peaceful, inclusive, competitive, middle- to high-income industrialised region, where all citizens enjoy sustainable economic well-being, justice and freedom"

The SADC Digital Transformation Strategy objective is to drive and accelerate the strategic adoption of digital technologies by and in all SADC Member States, digitally empowering citizen's businesses and institutions, and therefore maximizing the economic, social and political impact of the use of digital technologies for the benefit of SADC people's quality of life and in favour for fulfilling SADC's regional development agenda.

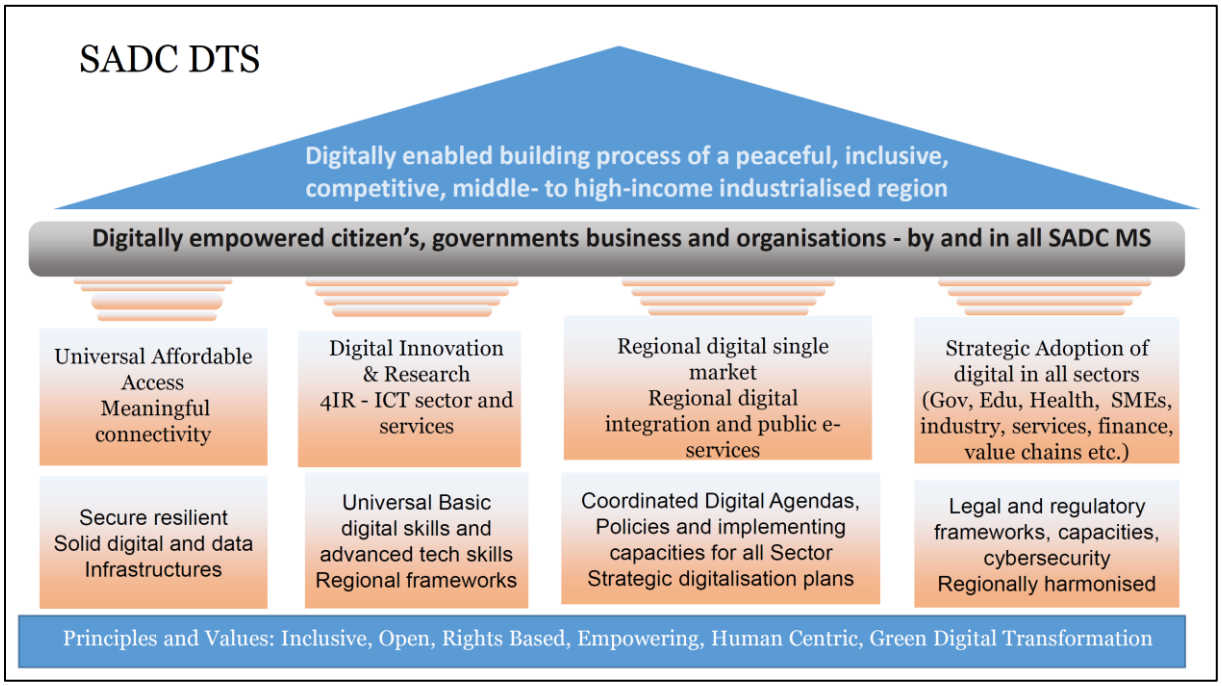

Figure 11: SADC DTS goal, objectives, strategic pillars and values.

The DTS 2030 objectives and targets include

- A solid, **redundant and secure regional digital infrastructure** is in place across the SADC region and between all SADC MS[14]; Targets indicators are that by 2030:
- all SADC MS have at least 2 cross borders linked with each neighbouring country
- there is at least 2 PoP[15] of international connectivity in each MS, offering capacity below the African average wholesale price.
    - SADC MS interconnected to each through regional IXPs, that route 80% of intra-SADC data exchanges.
- all SADC MS have above African average international capacity per internet user.
- Universal **broadband coverage** of SADC's population and territory **and Universal Access are achieved in SADC**; Targets indicators are that by 2030:

[14] Includes backbones, interconnected and redundant, IXPs, data centres, cybersecurity infrastructure

[15]

- 95% of the population is covered or in reach of affordable[16] broadband[17] connectivity;
- 90% of the urban population is within 25km of a fibre node.
- 90% of the SADC countries' heads of municipalities are connected **to a broadband backbone.**
- 90% of SADC the population older than 15 years old has access to affordable (or free) broadband connectivity[18];
- **Universal broadband adoption** is achieved among the SADC population. Targets indicators are that by 2030:
- 80% of SADC the population older than 15 years, is connected, using affordable broadband connectivity;
- 50% of households have a dedicated broadband Internet access
- 100% of formal Businesses use the Internet;
- Gender gaps in internet use, mobile phone ownership and digital skills are closed (parity achieved)
- 50% of the population enjoys Affordable and Meaningful Connectivity[19]
- Public services institutions are interconnected[20]; Targets indicators are that by 2030
- all secondary schools have broadband connectivity (using UN targets standards for quality[21]) and it is available for students and teachers
- all health centres are properly connected to a national health network and national health systems
- all post offices are connected to their national network
- all police stations and customs offices are properly connected to national networks and information systems
- **Digital Legal and regulatory frameworks** of all MS are updated and regionally harmonised, fully enabling digital transformation. Targets indicators are that by 2030:
- All MS have Digital Governance and Digital Rights frameworks in place by 2030 and meet the minimum African Target average of 48.8 in the Ibrahim Index of African Governance (IIAG) [22]
    - All SADC All MS to have domesticated the SADC MS to adopt (data protection, data governance, privacy, cybersecurity, e-transactions, platform regulation, consumer protection, digital freedom, legal instruments prohibiting harmful actions)
- All SADC MS have cybersecurity national legislations as well as done the ratification of the AU Malabo and Budapest convention

[16] affordability indicator and its threshold defined as per ITU/ UN broadband commission (currently as of 20022 2% of NGI per data of 2Gb data package available for 20 days), for at least all of the population (calculated by 5 income quintiles). UN 2030 target are: entry-level broadband subscription costs less than 2% of GNI capita and entry-level broadband subscription costs less than 2% of average income of the bottom 40% of population

[17] broadband speeds as per UN BB and ITU definition >10Mpbs download, with any technology: wireless, fixed, satellite). UN 2030 target mentions covered by a mobile network of the latest technology, that is the one with at least 40% of the population already covered

[18] includes its own device or public access, open WIFI, community centres, schools, post offices, or in the workplace

[19] The current meaningful connectivity target sets minimum thresholds across the four dimensions of internet access that matter most to users. Regular internet use | minimum threshold: daily use An appropriate device | minimum threshold: access to a smartphone Enough data | minimum threshold: an unlimited broadband connection at home or a place of work or study A fast connection | minimum threshold: 4G mobile connectivity. See https://a4ai.org/meaningful-connectivity/

[20] if these are of achieved other public services will be too connected once connectivity is available

[21] UN 20230 targets set : minimum download speed at every school = 20 Mb/s, minimum download speed available per student = 50 kb/s and minimum data allowance for every school 200 GB

[22] https://mo.ibrahim.foundation/iiag

- All MS have operational Computer incident response teams (CIRTs) or (CERTs)
- All MS have improved their cybersecurity (Legal measures, technical measures, organizational measures, capacity development measures and cooperation measures (such as the Global Cybersecurity Index (GCI) [23] and National Cybersecurity Index [24]).
- All MS have enabling frameworks of policy and regulation of ICT at G4 generation or equivalent (as per ITU's regulatory tracker[25])
- All MS have put in place E-Transactions frameworks
- All national MS consumer protection laws have been ratified.
- **Digital Skills:** SADC population is **Digitally Skilled**. Targets by 2030 include that:
- 50% of formal labour force has basic digital skills;
- 80% of youth have basic digital skills;
- 90% of public sector employees have basic digital skills;
- 50% of youth have advanced digital skills;
- A common regional digital skills and competencies framework is in place.
- Advanced digital skills are available for DT. Targets indicators are that by 2030:
- All SADC MS to have **adopted the Advanced Digital Competencies Framework** for advanced digital training and skills and have a critical mass of talents and skills in advanced digital technologies through the development of a shared regional advance digital competency and certification framework (data science, AI, software, IoT, sys engineers, Analytics, etc)
- SADC MS implement **strategies to develop, attract, and retain talents in advanced digital technologies** and monitor the national availability of skills regularly, potentially through an annual statistical index (like the AI Oxford Insights Index[26]).
- **Digital Government** by 2030 in SADC MS is fully implemented. ` Targets indicators are that by 2030
- Enhanced gov efficiency, universal access to public services, delivered digitally and enhanced governance: all SADC MS public institutions have digitalised their operations and are proving digital services managed in compliance with privacy and security requirements, have the necessary trained and competent professionals, ensuring full maintenance and operability of infrastructures and full support to citizens, with special attention to marginalised groups and communities.
- 90% of national MS digital government plans/agendas KPIs achieved and EDGI scores have improved to average world level for all MS.
- Regional integration and regional single market are facilitated by interconnected and interoperable digital services
- National Digital Agendas and sectoral adoption policies are in place and well implemented. Targets indicators are that by 2030:
- all SADC MS to have **comprehensive National Digital Agendas** and roadmaps, as well as broadband plans, **aligned** with this DTS.
- all SADC MS have developed a digital policy and strategy planning toolkit adapted to the SADC context, for updating National Digital Agendas and mainstreaming digital into sectorial policies
- all MS **have sectorial digital plans in key sectors** (such as e-education, e-Agriculture, e-Health, e-Tourism, e-Financial sectoral, 4th IR / ICT industry) **aligned** with each SADC common regional sector digital framework.

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[23] https://www.itu.int/epublications/publication/D-STR-GCI.01-2021-HTM-E
[24] https://ncsi.ega.ee/
[25] https://app.gen5.digital/tracker/metrics
26 https://www.oxfordinsights.com/government-ai-readiness-index2021

- all MS have developed **specialised capacities for sector-specific digital transformation** thanks to regional sectorial platforms and centres of excellence
- Build a solid SADC research and innovation sector that supports innovation for DT and the 4th IR. Targets indicators are that by 2030:
- **NRENs in all MS are operational by 2025** and increasingly diversifying their research capacities and results in digital innovation;
- A **regional network of Centres of Excellence** related to digital innovation, emerging technologies and 4IR is established and fully operational;
- There is a greater **regional integration** in terms of research on digital innovation, emerging technologies and 4IR;
- The **gender gap** in digital innovation, emerging technologies and 4IR in the region is closed by 2030.

3.2 Principles and values for SADC Digital Transformation

SADC's Digital Transformation Strategy is based on the following principles and values:

- **SADC MS recognize that access to quality broadband internet and its services, is a right**[27] and all SADC inhabitants should have the right to access it and benefit from it. SADC MS endorse the UN resolution of 2016[28] that emphasises the importance of *"applying a comprehensive human rights-based approach when providing and expanding access to the internet and for the internet to be open, accessible and nurtured*". Therefore, SADC MS recognize **that the right to Internet access, also known as the right to broadband or freedom to connect,** that all people must be able to access the Internet to exercise and enjoy their rights to freedom of expression and opinion and other fundamental human rights. That implies that the SADC Member States have a responsibility to ensure that Internet access is broadly available, affordable (or with free public access alternative) and that states may not unreasonably limit an individual's access to the Internet. Access to SADC MS internet access should be unrestricted at all time, and the government should refrain from internet shutdowns or degradation of internet access to lawful content and services.
- **SADC Member states commit to an inclusive digital transformation,** committing to implement public policies to leave no one behind, recognising that broadband and digital services should be made accessible to all citizens, affordable for everyone everywhere across SADC, creating equal access to opportunities for all. SADC MS commit to mitigating the risks of digital exclusion based on gender, income, location, language spoken, disability, political orientation, and to promoting the benefits of digital based on shared values and trust, civic participation, openness and transparency.
- **SADC's digital transformation will be human-centric** - centred on the individuals' needs, with information content that is useful for citizens and will preserve and respect the diversity of the local values, cultures and beliefs of SADC Citizens.
- **SADC MS commit to preserving the same human rights and the principles of the rule of law online as offline**, including those related to protecting individuals' privacy and their personal data, the freedom of speech online safety and protection against (online) violence and (cyber)crimes. They commit to opposing the abuse of the internet or algorithms for unlawful surveillance or oppression, combat illegal and harmful content and online activities, bolster resilience to disinformation and misinformation while promoting the right to freedom of expression. SADC MS also commit to online protection of consumers, in particular vulnerable consumers.

[27] or a public service
[28] https://www.article19.org/data/files/Internet_Statement_Adopted.pdf

- **SADC MS commit to an unfragmented and open Internet,** a unified, global and properly governed root and naming/numbering system; interoperability; universal accessibility; the reusability of capabilities; and permission-less innovation.
- **SADC MS commit** to maximising the enabling effects of sustainable digital technology for combating climate change and protecting the environment, and adopting the principle of **twin green and digital transformation,** also mitigating or minimising the negative impact of digitalisation.

4 SADC DTS Strategic interventions

To achieve the objectives, the SADC DTs will be implemented along the following seven key strategic interventions:

- Strategic intervention 1: **Universal affordable access and inclusive adoption, supported by robust resilient and secure infrastructure**
- Strategic intervention 2: Updated and **regionally harmonised legal and regulatory** frameworks to enable full digitalisation
- Strategic intervention 3: Developing **capacities** and improving **readiness for digital adoption** across all sectors
- Strategic intervention 4: **E/Digital-Government** as a driver of government efficiency and the digitalisation of the economy
- Strategic intervention 5: **Digital skills for all** SADC citizens
- Strategic intervention 6: Promote funding, open access and dissemination in **research for digital innovation**
- Strategic intervention 7: Strengthen linkages, synergies, and closing gender gap in **digital innovation entrepreneurship** and research ecosystems

In addition, the DTS will implement **the SADC Digital Observatory** that will benchmark and asses the status go DT in the SADC region, as well as monitor the DTS implementation, evaluating its outcomes, impacts and lessons learned.

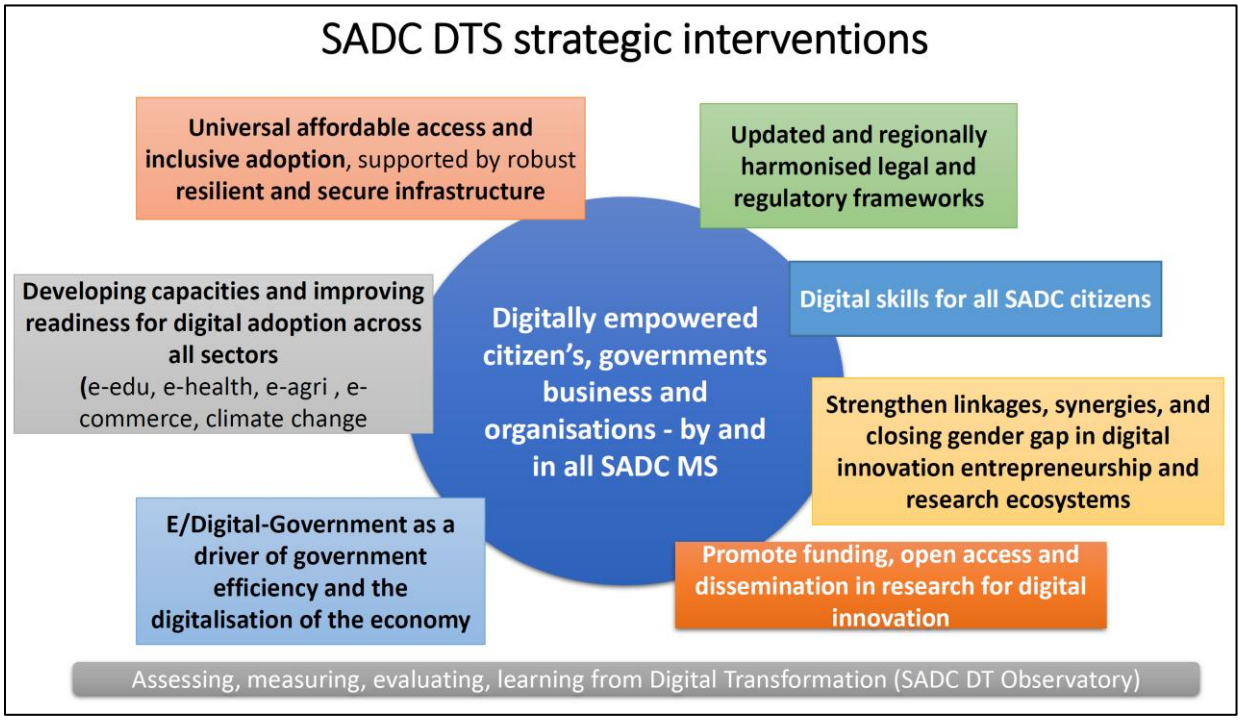

Figure 12: SADC DTS areas of strategic interventions

4.1 Universal affordable access and inclusive adoption, supported by robust resilient and secure infrastructure

During the situational analysis, **these gaps were identified in the SADC region**:

- **Coverage gaps**; Large geographical areas in the Member States, especially rural areas with limited population density, still do not have services as it is costly to deploy

infrastructure and services. In addition, policies need to ensure service deployment and promote investment in areas that are currently not attractive enough for investors.

- **Usage gaps**: There is a large fraction of the population covered in the SADC (roughly 70%) with possible access to digital services, but 49% do not have access, due to the high cost of services, lack of affordable devices and basic skills as well as a lack of relevant content and services in local languages, etc. As such, policies should focus on ensuring usage.
- **Broadband Affordability gaps**: The high cost of access to data in relation to monthly individual incomes, especially for low-income and/or rural populations is a key barrier. The cost of wholesale capacity and cross-border links for landlocked countries, international peering, and low competition in specific markets were mentioned as some of the structural causes of the high costs affecting overall affordability.
- **Device affordability gap**: The high cost of devices, such as smartphones, in relation to monthly incomes, especially for low-income populations is another key barrier.
- **Meaningful connectivity gap**: A newly developed concept, differentiating the "well connected" and those having access to "basic connection". Member States have to design strategies to ensure that all citizens can make full use of the potential of digital (i.e., access to sufficient data and affordable devices).
- **Infrastructure Investment gap**: In the region, the investment gap of 32 billion US Dollars to ensure universal affordable connectivity (UN targets 2030) can only be covered with large private sector input (90% of the infrastructure investments in capital and operations). For this, the region will need to set up enabling environments and strategies to attract all these needed investments.
- **Access to electricity gap:** Critical gap in particular in rural areas of many Member States, needs to be addressed.

The strategic response to address these gaps will be:

- SADC MS to update their connectivity policies and broadband plans aligned with this SADC DTS targets
- Set ambitious coverage and penetration targets, align with regional
- Include affordability as a target, and ideally meaningful connectivity
- Include digital inclusion actions and targets (disaggregated by gender, location and income groups) with resources allocated
- Include both services demand stimulation (skills, content, devices, relevant services) and incentives for the offer
- Have special plans and targets for ensuring rural broadband expansion with a differentiated set of regulations (different spectrum prices, different licences, different fiscal regimes, subsiding shared infrastructures etc), and promoting broadband wholesale price load balance in the MS (wholesale capacity sols
- Maximise competition on services (lowering barriers to market access, enabling innovative business models as MVNO, access to market resources and finance)
- Make wise, targeted, focused and transparent use of universal service funds
- Do not tax access the internet as a luxury good
- Include public access (open WIFI, community centre)
- Enable community networks (special licences,
- Adopt infrastructure sharing (passive and active inf.), spectrum planning for inclusion (vs fiscal income), modern ICT regulatory regimes (neutral licences, enabling new business models as VMNOs etc), open access networks, coverage and services licence obligations

- Incentivise and facilitate massive private sector investments (tax and other incentives, clear plan, legal, single window for all paperwork including licences, rights of way and work permits)
- Plan for robust, interconnected and secure and resilient backbones and incentivise operators to expand connectivity backbone, and offer affordable services
- Include plans to make access devices more affordable
- Address regionally some key challenges as:
    - Incentivising and enabling **more regional cross-country investments** for more cross-border country links and backbones **interconnectivity,** resilience and redundancy
    - Lower the **cost of access to international capacity** and submarine cables for a land-locked country
    - Have more interconnected data infrastructures and connectivity through regional IXPs and CDN/data centres

To do so the SADC DTS will

- Implement a regional support program for enhancing MS national capacity to design and implement connectivity policies/plans/strategies, which could be done via a regional centre of excellence for broadband/ training/planning/implementation, that will include
- Design of SADC Model laws, and regulatory tools for affordable broadband and digital inclusion – ensuring regional harmonisation of legal/reg frameworks
- Provision of technical assistance (TA) for its domestication, national plans design and implementation support
- Exposure to best practices, sensitisation, and awareness of MS stakeholders
- Capacity and training for national MS specialists in all aspects related to modern connectivity strategies and regulatory frameworks
- Networking and exchange among peers implementing digital inclusion plans
- benchmarking (ICT observatory) and connectivity policies impact studies
- Help design regional collaborative connectivity projects (including sharing satellites access across borders etc)
- Implement 3 regional programs
    - A **regional connectivity incentives program** to lower regulatory and policy barriers and ensure backbone interconnection, cross-border links, access to cable capacities, interconnecting public backbones (and utility fibre), etc.
    - A regional network of interconnected IXPs with CDNs/Data centres
    - A regional program to ensure the availability **of affordable access devices** (smartphones)

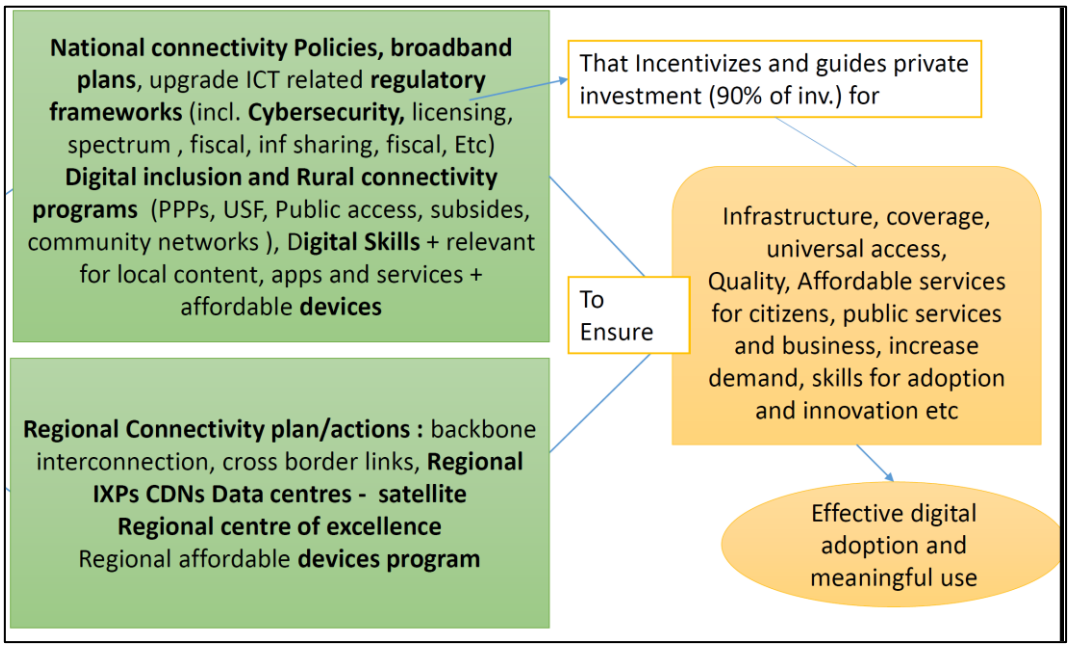

Figure 13: Addressing universal affordable connectivity challenge in SADC

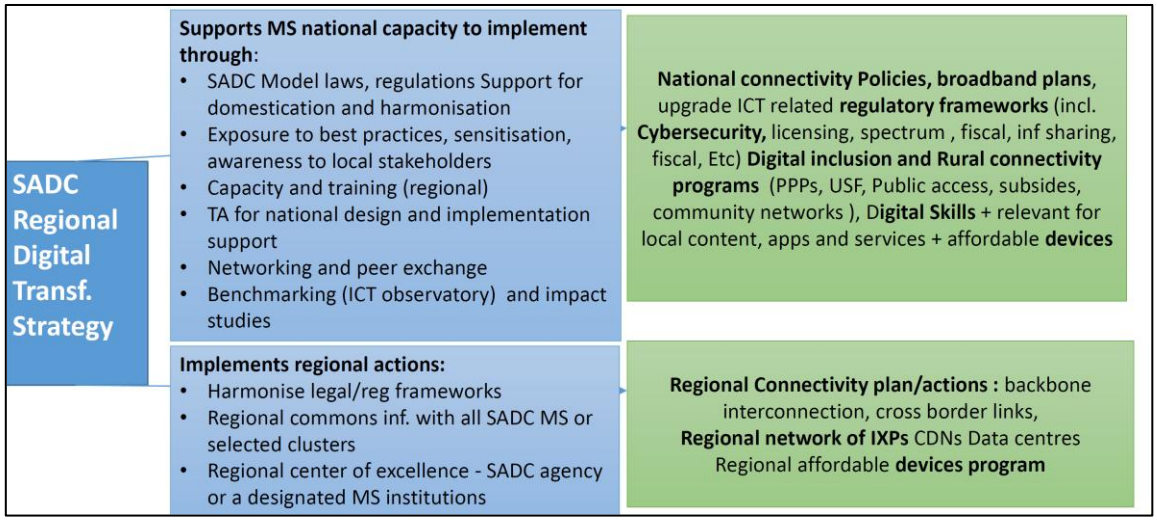

Figure 14: DTS strategic intervention to support MS achieve universal access and digital inclusion

The expected result of this intervention areas

- A solid, **redundant and secure regional digital infrastructure** in place is in place across the SADC region and between all SADC MS[29]; Targets indicators are that by 2030:
- all SADC MS have at least two cross borders linked with each neighbouring country
- there is at least 2 PoP of international connectivity in each MS, offering capacity below the African average wholesale price.
    - SADC MS interconnected to each through regional IXPs, that route 80% of intra-SADC data exchanges.

[29] Includes backbones, interconnected and redundant, IXPs, data centres, cybersecurity infrastructure

- All SADC MS have above African average international capacity per internet user.
- **Universal broadband coverage** of SADC's population and territory **and Universal Access are achieved in SADC**; Targets indicators are that by 2030:
- 95% of the population is covered or in reach of affordable[30] broadband[31] connectivity;
- 90% of the urban population is within 25km of a fibre node.
- 90% of the SADC countries' heads of municipalities are connected **to a broadband backbone.**
- 90% of SADC the population older than 15 years old has access to affordable (or free) broadband connectivity[32];
- **Universal broadband adoption** is achieved among the SADC population. Targets indicators are that by 2030:
- 80% of SADC the population older than 15 years, is connected, using affordable broadband connectivity;
- 50% of households have fixed broadband Internet access
- 100% of formal Businesses use the Internet;
- Gender gaps in Internet use, mobile phone ownership and digital skills are closed (parity achieved)
- 50% of the population enjoys Affordable and Meaningful Connectivity[33]
- Public services institutions are interconnected[34]; Targets indicators are that by 2030
- All secondary schools have broadband connectivity (using UN targets standards for quality[35]) and it is available for students and teachers
- All health centres are properly connected to a national health network and national health systems
- All post offices are connected to their national network
- All police stations and customs offices are properly connected to national networks and information systems

The following matrix summarises the intervention

[30] Affordability indicator and its threshold defined as per ITU/ UN broadband commission (currently as of 20022 2% of NGI per data of 2Gb data package available for 20 days), for at least all of the population (calculated by 5 income quintiles). UN 2030 target are: entry-level broadband subscription costs less than 2% of GNI capita and entry-level broadband subscription costs less than 2% of average income of the bottom 40% of population

[31] Broadband speeds as per UN BB and ITU definition >10Mpbs download, with any technology: wireless, fixed, satellite). UN 2030 target mentions covered by a mobile network of the latest technology, that is the one with at least 40% of the population already covered

[32] includes its own device or public access, open WIFI, community centres, schools, post offices, or in the workplace

[33] The current meaningful connectivity target sets minimum thresholds across the four dimensions of internet access that matter most to users. Regular internet use | minimum threshold: daily use An appropriate device | minimum threshold: access to a smartphone Enough data | minimum threshold: an unlimited broadband connection at home or a place of work or study A fast connection | minimum threshold: 4G mobile connectivity. See https://a4ai.org/meaningful-connectivity/

[34] if these are of achieved other public services will be too connected once connectivity is available

[35] UN 20230 targets set : minimum download speed at every school = 20 Mb/s, minimum download speed available per student = 50 kb/s and minimum data allowance for every school 200 GB

Strategic intervention: Universal affordable access and inclusive adoption, supported by robust resilient and secure infrastructure			
ACTIONS	**OUTPUT**	**OUTCOME**	**IMPACT**
Set up an agency and implement a **regional support program for enhancing MS national capacity** to design and implement connectivity policies/plans/strategies (with technical assistance, training, awareness actions, peer exchange, benchmarking)	• Are designed SADC Model laws, and regulatory tools for affordable broadband and digital inclusion • MS have better capacity and access to TA for national broadband plans design and implementation of new regulatory frameworks • Regional and MS progress is monitored and benchmarked, and impact studied • Some regional collaborative connectivity projects are designed	• MS develop and implemented effectively rural their national broadband strategies resulting in network expansion, more competition, better and affordable services • Regional backbones interconnected, resilient, redundant, offering cheaper wholesale capacity • Affordable services and devices are available to all	• Universal broadband coverage of SADC's population and territory • Universal Access and broadband adoption are achieved among the SADC population. • Gender gaps in Internet use, mobile phone ownership and digital skills are closed (parity achieved) • Public services institutions are interconnected
• Design a regional interconnectivity promotion program • Design and implement programs for regional connectivity and interconnection of data infrastructures • Design and implement a regional program to ensure the availability of affordable access devices	• Regional backbone interconnectivity promotion and incentives program is implemented • Regional network of interconnected IXPs with CDNs/Data centres is in place • Implemented a regional program of affordable access devices (smartphone assembling or production)		

4.2 Updated and regionally harmonised legal and regulatory frameworks to enable fully digitalisation

The following key gaps related to the legal and regulatory frameworks to enable digital transformation in SADC were identified:

- **Data protection gap:** SADC Data Protection Model Law being modernised in line with EU GDPR and international best practices. Not all Member States have Data Protection Regulations. Some MS indicated they do have some new regulations (Cyber, Data Protection and Electronic Transaction).

- **Data policies and availability**: There are growing concerns that in several SADC countries, government agencies and private entities are collecting and processing personal data without adequate data protection frameworks, amidst weak oversight mechanisms and inadequate remedies.
- **Internet policy gap:** Despite a regional infrastructure policy aimed at establishing affordable, always-on internet availability in the region, low levels of internet access persist in SADC countries to achieve the global call to action for universal internet access and affordability by 2030[36] .
- **Cybersecurity regulation gap**: National Cybersecurity gaps: Only 14 Member States in Africa have signed the "Malabo convention" [37], while only three SADC Member States have signed it (Comoros, Mozambique and Zambia). Reasons for the lack of Ratification and low adoption may be a lack of awareness of benefits and requirements. This point is also valid for the Budapest convention which has a low adoption within SADC.
- **ICT Regulatory Tracker gap:** Identified gaps in regulatory frameworks, make the case for further regulatory reform towards achieving an inclusive ICT sector in terms of Regulatory authorities, Regulatory mandates, Regulatory regimes and Competition framework for the ICT sector. Gaps were identified in the top three SADC countries which are represented by Malawi, Botswana and Tanzania.
- **Consumer protection gap**: No data for some countries like Mozambique, Eswatini, and Lesotho. Zimbabwe provided new data on their Consumer Protection Act[38].
- **Digital Freedom gap:** SADC Global Freedom status variates within the Member States but is essentially Free and Partially Free. Internet freedom misses a lot of data input from the SADC Member States. SADC is enacting restrictive cyber laws that have a chilling effect on online journalism and freedom of expression[39].
- **Gender Gap:** SADC has engendered women's empowerment and gender equality across sectors at regional and national levels, and in 2019 adopted a Regional Multi-Dimensional Women's Economic Empowerment Programme aimed at promoting women's economic empowerment and gender-responsive development. Information, communication, and technology (ICT) are among the sectors where women are under-represented, and such a gender gap also exists in the digital economy that is growing very fast globally. It is, therefore, important to strengthen women's empowerment in the ICT sector by developing national and regional initiatives that foster the participation of women and girls in the ICT sector.
- **Policy and Regulation Uncertainty**: Policy and regulation of Digital technologies are still unclear in areas including liability, right to explain, and data access. Many organisations have concerns about regulatory compliance.
- **Societal Trust in DT**: There are many misconceptions and much misinformation about technology systems in societal debates, and the technology seems not to be fully accepted by society in all application areas.
- **E-Transactions Laws**: small gap, laws exist in most SADC Member States.

The context is that:

- SADC MS rankings are declining in indexes related to Security & Rule of Law and Participation, Rights & Inclusion.
- There are many draft laws or amendments to existing legislation in Cybersecurity
- E-Transactions Legislation are still in Draft in some of the SADC MS

36 https://institute.global/policy/progressive-case-universal-internet-access-how-close-digital-divide-2030
37 https://au.int/en/treaties/african-union-convention-cyber-security-and-personal-data-protection
38 https://www.law.co.zw/download/consumer-protection-act/
39 https://www.voanews.com/a/media-freedom-group-calls-on-sadc-countries-to-repeal-internet-laws-/6301566.html and https://www.newzimbabwe.com/sadc-nations-using-internet-shutdowns-as-tools-for-repression-misa/

- Fair competition among businesses and consumer protection for many transition economies still lack laws to protect consumers online
- Internet freedom is still weak in SADC MS
- Women's civil society participation, increasing over the decade, has deteriorated between 2015 and 2019
- Low consumer confidence for business-to-consumer e-commerce
- **S**low ratification and domestication of certain online protocols

To address the challenges and archive the target on digital legal and regulatory frameworks the SADC DTS will develop and implement **a response strategy** that will aim to:

- Support all SADC MS to adopt and enforce sound digital Legal and regulatory policies and have the necessary implementing capacities, clear guidelines in place that set the principles, models, and standards needed for efficient and effective implementation of e-governance (including data protection, cybersecurity, privacy laws etc.), and in line with a common regional framework.
- **Support all SADC MS to develop Data Protection, Cybersecurity, e-Transactions, and consumer protection laws** which take into account citizens' and SME/MSME feedback and needs while also providing tools that can be used at the regional level, such as national laws models that are recognised and adopted in all SADC MS;
- **Support all SADC MS to adopt a common ICT regulatory** framework, in terms of Regulatory authorities, mandates, regimes and competition framework for the ICT sector makes the case for further regulatory reform in the national and regional context
- **Raise** awareness **in** SADC **MS about the legal and policy implications** among parliamentarians through representations to Parliamentary Committees, committees addressing the questions of emerging technologies and their governance, and organisation of forums for parliamentarians to exchange knowledge.
- Set up a **regional platform for peer learning, support and dissemination** of good practices among SADC MS on digital regulatory frameworks
- **Collaborate** with Media, Government and MS agencies to promote **digital rights and freedom** in all Member States For reference the analysis[40] from the Media Institute of Southern Africa (MISA) and the United Nations Educational, Scientific and Cultural Organization (UNESCO) reviews laws that protect media freedom in each SADC state and provide country reports. The document provides an overview of international laws protecting media freedom, including an examination of the constitutional protection of media freedom to determine its compatibility with international law, the status of the international human rights instruments; and a catalogue of the laws that unduly restrict media freedom.

For this response strategy to work it is expected that all **SADC Member States (MS) commit to:**

- **Have** a law for digital rights, data privacy, Data protection, Cybersecurity, e-Transactions, consumer protection and capacities to enforce it. For that, there is a need to increase awareness, adapt national laws, foster intuition and capacities to implement, and budget
- Ratify and are implementing the Malabo Convention and communicate the advantage and disadvantage of ratifying the Budapest convention by pointing at the complementary aspects of the Malabo and Budapest convention (as per the council of Europe analysis[41])
- Implement the mandates, regimes and competition frameworks for the ICT sector, while making the case for further regulatory reform in the national and regional ICT context

40 https://unesdoc.unesco.org/ark:/48223/pf0000381397

41 https://www.coe.int/en/web/cybercrime/news/-/asset_publisher/S73WWxscOuZ5/content/malabo-and-budapest-convention-towards-complementarity?inheritRedirect=false

The DTS strategic response target in this area is that:

- By 2030, all MS **Digital Legal and regulatory frameworks are updated and enforced**, fully enabling digital transformation and regionally harmonised
- **All MS have Digital Governance and Digital Rights frameworks** in place by 2030 that include all the necessary provisions to ensure online security, respect for rule of law, digital civic participation, protection of rights online, access to online public services, freedom of online entrepreneurship, etc**. Indicator**: All SADC countries meet the minimum African Target average of 48.8 in the Ibrahim Index of African Governance (IIAG) [42] and have at least improved the index score by about +1.2 each year
- **All SADC MS have domesticated the SADC Data Protection Model Laws**. This implies preparing the Data Protection Guidelines for SADC which is a detailed set of best practice guidelines to assist and facilitate the implementation of the SADC Data Protection Model Law. These guidelines will contain the most critical recommended actions tailored to the SADC region's landscape, to take on Data Protection at the regional, national, and organisational levels. The Guidelines will be the region's blueprint for policy and regulatory development process, operational guidance and best practices. It will outline a practical approach to data protection legislation, and therefore can be used as a capacity-building manual for legislative committees or other government entities in charge of developing national data protection laws; **Indicator:** by 2030 - 90% of national MS Data protection laws have been ratified.
- **All SADC MS ratify cybersecurity national legislations** as well as the **ratification of the AU Malabo convention**[43] by 2030**.** This implies the deposit, the ratification, and the signature. To institutionalise the SADC Harmonised Cybersecurity Legal and Regulatory Framework and SADC Cybersecurity Action Plan, Member States need to set up their National Computer Incident Response Team (CIRT). A CIRT is the most critical mechanism and institutional structure that supports the implementation of the cybersecurity legal and regulatory framework. It is the national focal point for coordinating the receipt, review and response/action of recovery or prevention of cyber threats in the country. It is also responsible for building the necessary capacity and promoting a national culture of cybersecurity and raising awareness of the risks and consequences of cyberattacks. **Indicator 1:** deposit by 2025 for the 13 MS who have not signed the Malabo convention, Ratification by 2027 and target date of signature for all SADC MS by 2030. **Indicator 2:** 3 operational Computer incident response teams (CIRTs) or (CERTs).
- **All MS have enabling frameworks of policy and regulation of ICT** inactivating the right networks and services which are being put in place and implemented at regional and national levels. Silo-style ICT sector regulation isn't viable in the digital world. Collaborative regulation will mirror the interplay between digital infrastructure, services and content across industries and national borders. It will also harmonize rules and ensure consistent implementation of policy and regulatory framework that have evolved independently in many sectors with the Regulatory authorities, Regulatory mandates, Regulatory regimes and Competition framework for the ICT sector. **Indicator:** Increase by 1 point each year 2022-2025 in the scorecard of the ITU regulatory tracker index and all MS move to G4 status by 2030.
- **All MS have put in place E-Transactions Laws** which is a prerequisite for conducting commercial transactions online and have e-transaction laws that recognize the legal equivalence between paper-based and electronic forms of exchange. **Indicator:** by 2030 - 100% of national MS e-transaction laws have been ratified.
- **All MS have put in place consumer protection Laws Model Law** which serves as an avenue for promoting transparency, accountability, and trust in the digital age, helping shield both consumers and small businesses from unfair practices online. **Indicator:** by 2030 - 100% of national MS consumer protection laws have been ratified.

[42] https://mo.ibrahim.foundation/iiag

43 https://au.int/en/treaties/african-union-convention-cyber-security-and-personal-data-protection

Strategic response matrix

DTS Strategic intervention: Updated and regionally harmonised legal and regulatory frameworks to enable full digitalisation			
ACTIONS	**OUTPUT**	**OUTCOME**	**IMPACT**
• **Prepare model laws** and digital regulations for SADC MS to adopt (data protection, data governance, privacy, cybersecurity, e-transactions, platform regulation, consumer protection, digital freedom, legal instruments prohibiting harmful actions) • **TA, training and support to MS** for the **domestication and implementation** of the model cyber laws, regulations and national data governance frameworks and i**mplement a platform** for **regional cooperation**, peer **learning, support and dissemination** of good regulatory practices among SADC MS officials (all areas including cybersecurity) • Develop a **regional SADC cybersecurity strategic plan** (collaborative regional actions) that will include (1) promotion ac**tions and TA to incentivise all MS to ratify** multilateral regulatory agreements as Malabo and Budapest conventions (2) **TA** capacity-building for building Computer national incident response teams (CIRTs) or (CERTs) in SADC MS and secure their cyber domains, (3) the regional **cybersecurity governance and**	• **Regional model policy, laws, regulation, and implementation guidelines** related to digital are available for domestication by MS • **Capacities for digital regulation design and enforceme**nt implementation are developed in SADC MS • **Regional cybersecurity plan and collaboration mechanism** are approved activities identified and planned • MS a**ctively collaborating on national implementation**, on **the Regional SADC CIRT** and a **regional legal interoperability mechanism on digital**	• All **SADC MS have comprehensive sound National data privacy, Data protection, Data governance Cybersecurity, e-Transactions, and consumer protection laws** • All MS have ratified and domesticated **the AU Convention on Cybersecurity and Personal** Data Protection (Malabo Convention) and the Budapest convention). • Governance and coordination mechanisms within SADC MS are set and effective on **regional digital regulatory frameworks harmonisation** • Regional SADC national and regional **Cybersecurity response coordination capacity** strengthened • Computer incident response teams (CIRTs) or (CERTs) are coordinated and collaborating in the region	• SADC MS digital **regulatory frameworks** and effective enforcement, the **i**mproved cybersecurity, **create online trust and safety, enable digital innovation and incentivise investment in digital economy** • The enabling environment for **regional single digital market** is built

coordination mechanisms within SADC MS, and (4) the **Regional SADC CIRT** and a **Regional legal interoperability** mechanism			

4.3 Developing capacities and improving readiness for digital adoption

The situational analysis for SADC digital transformation showed that the following gaps and challenges related to digital skills have to be addressed to enable digital adoption across all sectors:

- **National/regional digital sectorial strategies gap**: the SADC Member States do not always have digital aspects embedded in their national sectorial strategies and policies and legislations (as for e-education, e-agriculture, e-health, e-tourism, e-financial sectoral)
- **Strategic implementation coordinated planning gap**: In the last 10 years, most countries have made substantive changes to their national ICT strategies and planning, though strategies frequently lack timetables and KPIs.
- **Lack of coordination and silos**: Country progress is sometimes undermined by a lack of coordination and silos across the governments.
- **Digital agendas gap:** Most of the SADC countries have Digital Agenda plans articulated but the level of implementation varies from countries highly advanced like Mauritius, South Africa, to countries with missing plans like Comoros and Madagascar.
- **Gender Gap:** Women and girls' participation in the ICT sector and skilled workforce etc is lower than men's.
- **Digital skills gap:** Skills penetration of Advanced Digital technologies is low for most SADC Countries in Artificial Intelligence, Cybersecurity, Cloud Computing and other emerging technologies. The Demand versus Supply Gap in Digital Skills is still high in SADC countries.
- **Skills retention gap**: Many SADC MS lack the skills in Scientific and Quality of Life Policies. A global competition for talents is underway. Regions with the most vibrant Digital landscape are better positioned to attract skilled professionals.
- **Higher Complexity of DT in Industry and Public domain Gap**: Implementing DT, AI, data and robotics in industrial and public environments relies on incorporating the domain knowledge of underlying processes. Handling this gap requires combining domain-specific process knowledge with based knowledge.
- **Societal Trust in DT Gap**: There are many misconceptions and much misinformation about technology systems in societal debates, and the technology seems not to be fully accepted by society in all application areas.
- **Regional digital integration challenges -single digital market**: Developing a single African digital market with harmonized data policies gap across the continent would help SADC tech companies compete at home and abroad and strengthen the SADC's negotiating power relative to global tech companies and other jurisdictions, including the EU.
- **Access to advanced DT Infrastructure Gap:** Both academics and innovators (SMEs and start-ups in particular) need good access to world-class innovation infrastructure including access to data and resources such as HPC (High-Performance Computing) and test environments, etc.

- **Technological Barriers Gap**: There is considerable complexity and cost in creating systems with the ability to collect, process, and analyse large quantities of data to make robust and trustworthy decisions and achieve autonomy.
- **Interoperability Gap:** Interoperability refers to the ability of different IT systems to be able to exchange data, communicate and verify identities. It ensures a common understanding of the exchanged data between systems and across organizations. Most governments have citizens' data in different silos – a lot of times these data systems are not compatible.
- **Data policies and availability Gap**: There are growing concerns that in several SADC countries, government agencies and private entities are collecting and processing personal data without adequate data protection frameworks, like weak oversight mechanisms and inadequate remedies.
- **Gap for Resource Mobilisation and Coordinated Investment:** Difficulties in resource mobilisation and a lack of coordination in investment are hindering the financing of digital transformation of Governments, however, are moving to address these difficulties through the adoption of more centralised or coordinated approaches.
- **Gap to Coordinate Financing, Procurement, and Affordability for Digital Tools and Services**: Such centralised or coordinated approaches may have downstream effects on financing, procurement, and affordability of digital tools and services, as government ministries often seem to have widely different experiences across individual ministries and agencies.
- **SADC private investment environment Gap**: Access to Finance is still lagging behind other parts of the world, Africa needs to create a competitive, forward-looking private investments ecosystem, to boost innovation in AI in a fast and focused way. Though the continent is embracing the Fourth Industrial Revolution, the African Development Bank has found that access to finance, skills and inclusive growth needs to be improved. On the supply side, Africa is characterized as an adopter of Fourth Industrial Revolution technologies instead of a net producer, which indicates that the African start-up system is undercapitalized, unlike Silicon Valley, whose ecosystem has universities, investors, infrastructure and the right incentives to support start-ups

To address these challenges, the SADC DTS will develop and implement a response strategy that will aim to:

- **SADC MS to have comprehensive sound Digital Sectorial plans and the needed implementing capacities,** clear guidelines that set the principles, models, and standards needed for efficient and effective implementation of digital in all sectors (such as e-education, e-Agriculture, e-Health, e-Tourism, e-Financial sectoral), and **in line with a common regional framework.**

For this response strategy to work it is expected that **SADC Member States (MS) commit to:**

- Develop and implement a National Digital Agenda
- Develop Digital Sectorial plans including a Roadmap with an action plan and timeline and assign implementing capacities
- Develop a competency and certification framework to ensure that digital skills become a core competency of every teacher and student
- Developed a supply gap strategy in advanced digital skills
- Focus on Human-Centred Digital Transformation: Connectivity, inclusion, and digital literacy, as well as a culture of innovation and entrepreneurship foundational elements of an agenda for human-centred digital transformation.
- Put in place legislation and architecture model for digital interoperability standards
- Harmonise Sectoral Policies Across Government: countries and create coordinated and adaptive governance around their national and sectoral digital strategies.

- Invest in appropriate infrastructures, such as robust connectivity and storage capabilities (onsite or cloud) for data and their security layers.
- Have a data strategy that foresees the necessary processes for digitization and data integrity, training and validation sets, and test datasets and promotes Open Data and the creation of open repositories for publicly funded or owned data and research including the creation of platforms for open government data.
- Cultivate an active and broad network of donors, investors and funders that is easily accessible to innovators and start-ups.
- Develop technical pilot projects on the use of digital technologies in sectors, such as agriculture (eAgriculture), energy (eEnergy), governance (eGovernance), health (eHealth), climate change (climate services), and Security Operation Centre (SOC) using Big Data, Artificial Intelligence (AI), and Internet of Things (IoT);
- Collaborate with at least 2 sectorial Digital Innovation Hubs and 1 Advanced Technological Innovation Hub

DTS 2030 targets are as follows:

- **Key economic sectors are ready for the digital transformation.** MS policies are updated and fully enabling sectorial digital transformation, regionally harmonised by 2030
- All SADC Member States have Capacities for embedding designing and implementations q digital in the national sectorial strategies, policies, and plans by 2030. Indicators:
- All SADC countries have Digital e-education, e-Agriculture, e-Health, e-Tourism, e-Financial sectorial strategies and action plans by 2030
- **All MS have Improved their rankings and** meet the minimum African Target average[44] **in Digital Preparedness Index**[45]**, the indicators** measure enablers that facilitate a country's adoption, use and local development of digital technologies.
- All SADC MS to have adopted a **teachers 'Digital Skills Framework' to assess and strengthen their digital skills**. **Indicator:** All SADC Member States adopt and implement teachers' digital skills competency framework by the end of 2030.
- All SADC MS have adopted **a framework for advanced digital competencies and skills.** They have developed guidelines for developing digital skills in higher education which stimulate inclusive coding in SADC. **Indicator:** All SADC members adopt and implement a digital competency frameworks and guidelines for students' digital skills by 2030. **Indicator 2**: Increase the number of computer coders (including girls and students with disabilities) by 10% on an annual basis
- All SADC MS have (public and private sector-driven) **digital device access promotion schemes,** by 2030. **Indicator:** In all SADC MS, devices are available for 50% of students and 100% of teachers by 2030.
- All SADC MS have **Sustainable NRENs**[46]: All SADC members have active NRENs with established roadmaps and business plans and platforms **supporting research networking** by 2030
- All SADC MS have **a critical mass of talents and skills in advanced digital technologies** e.g., artificial intelligence, big data, cybersecurity, cloud computing and other emerging technologies. **Indicator:** The Demand versus Supply Gap in Digital Skills needs to be balanced in SADC countries with 70% of the demand for foundational digital skills and another 30% will be for non-ICT intermediate-level digital skills (Analytical and Interpersonal skills, character and behaviour)
- All MS **develop specialised capacities for sector-specific digital transformation** through regional sectorial platforms and centres of excellence, that allow the exchange

[44] Improving higher weight of 0.25 each to the first three dimensions (i.e., education and skills, infrastructural readiness and the business dynamism and environment indicators) to meet at minimum the 0.35 target
[45] https://cseaafrica.org/gism/
[46] National research and education network

of research insights on different aspects of digital technologies and their application in sectorial domains. **Indicator:** Establishment of National Sectorial experts list updated every 6 months

- All SADC MS have **implemented pilot projects** on the use of digital technologies in strategic sectors, such as agriculture (eAgriculture), energy (eEnergy), governance (eGovernance), health (eHealth), climate change (e-climate services), and Security Operation Centre (SOC) using Big Data, Artificial Intelligence (AI), and Internet of Things (IoT) by 2030. **Indicator:** All the MS have developed technical pilots by 2030
- SADC MS **implement strategies to develop, attract, and retain talents in advanced digital technologies** and monitor the national availability of skills regularly, potentially through an annual statistical index (like the AI Oxford Insights Index[47]). **Indicator:** Indexes should reflect an increase in advanced skills and talents every year

DTS 2030 strategic adoption support actions will

- Provide technical assistance to MS to build Digital Sectorial Strategy Plans for the identified countries with missing strategies
- Promote to All SADC MS the **foundational infrastructure for digital education** with attention to the reduction of the cost of Internet connectivity, improvement in the availability of devices, tackling bottlenecks in school and campus networks, accelerating the development of NRENs and promoting digital education-friendly learning space during the construction and renovation of educational institutions.
- Encourage in all SADC MS the **development of curriculum-aligned digital content** on secure platforms, respecting privacy and ethical standards. Core activities include enlisting teachers, curriculum designers, textbook publishers and others to develop and share digital content, developing standards, and creating regional platforms to exchange open educational resources.
- Support All Member States' efforts to **develop national digital sectorial strategies that serve as a basis for investment in digital education** - digital skills and application of ICTs in learning, teaching, assessment and research collaboration. It also addresses regional online safety and cybersecurity policies, guidelines and legislation for the education sector.
- Address Member States' **sectorial data and analytics capacity**. This objective seeks to foster the transition primarily focused on statistical data collection to leverage advances in web-based platforms, real-time data, hybrid learning, digital identity, data models, emerging technologies like big data, artificial intelligence for education data integration and interoperability.
- Promote a**dvanced Digital technologies skills** by establishing regional sectorial platforms and centres of excellence for the exchange of research insights on different aspects of digital technologies application in sectorial domains.
- Support MS in the **preparation** of **technical pilot projects** on the use of digital technologies in sectors, such as agriculture (eAgriculture), energy (eEnergy), governance (eGovernance), health (eHealth), climate change (climate services), and Security Operation Centre (SOC) using Big Data, Artificial Intelligence (AI), and Internet of Things (IoT);
- Facilitate all SADC MS **regional competency and certification frameworks** to ensure that digital skills become a core competency of every teacher and student in the region and that teachers are certified and recognized for their digital trainings.
- **Promote the collaboration** with **Digital Innovation Hubs** initiatives like AEDIB|NET[48] who has the objective to strengthen a common African European digital innovation

47 https://www.oxfordinsights.com/government-ai-readiness-index2021
48 https://aedibnet.eu/

ecosystem by supporting local digital innovation and start-up ecosystems in Africa and facilitating the collaboration between European and African DIHs. **Innovations hubs plans should comprise** sectorial domains (Agriculture, Health, Education, Tourism…) and technological hubs (AI, Big Data, IoT…) as well as the business models they adopt to remain operational ad **establish Partnership plans** amongst SADC and African Innovation Hubs to facilitate the uptake of Digital technologies with Partners like Botswana Innovation Hub, Afrilabs, etc.

- **Provide expertise to MS to address key gaps,** as subject matter experts to PPPs or by providing support for professional trainings through Digital Innovation Hubs
- **Foster policy frameworks for open** or **co-innovation in Digital Technologies** in sectorial domains, and international cooperation models with the EU for policies on health, agriculture, Finance and education.
- **Provide MS draft legislation for Digital interoperability standards** and regulatory requirements while engaging broadly with the public to promote policies on ethics (e.g., patient organizations).
- **Commission** a **regional/ national artificial intelligence strategy** task force that will develop (and help successfully implement) vertical and horizontal strategies and mechanisms adapted to local and national contexts, while benefiting from international innovations and experiences, to deliver on health care promise. A relevant initiative from the World Economic Forum's Framework for Developing a National Artificial Intelligence Strategy[49]. This is a framework that lays out for nations who have yet to develop an AI strategy, how to best get to a minimum viable solution.
- **Monitor** the **Digital Gender adoption** as SADC Member States undertook, in the SADC Treaty Article 6(2), not to discriminate against any person on the grounds of inter alia, sex or gender. SADC Member States have committed to mainstreaming gender into the SADC Programme of Action and Community Building initiatives as a prerequisite for sustainable development. This should be contextualised in Digital Jobs, Skills and Education within the SADC Member States. In addition, Gender equality is a priority on the EC agenda. For instance, the Commission has recently communicated the new gender strategy for the period 2020-2025, presented as one of the priorities of its mandate. The strategy underlines the importance of gender equality for achieving an economy that works for people, including when it comes to female representation and involvement in the financial environment. Women too often have higher levels of informality and lower levels of Digital literacy in SADC, ownership and have fewer assets and collateral than men.
- **Develop** a **Policy toolkit for science, technology, innovation, education, culture**, and communication policy instruments for sustainable development that can inform national Digital policies.
- **Promote open data standards**, public datasets, and security layers for data sharing and storage (onsite or cloud). Data sharing, data collaboratives, and data sharing framework agreements should be prioritized for public health, agriculture, education needs while strictly safeguarding privacy (whether it concerns ad hoc sharing, framework agreements, or data collaboratives, data solidarity/altruism, or data marketplace ecosystems).
- Organise regional forums for **mobilising financial and technical resources for digital sectors** in SADC MS and **Develop** an analysis of potential **Digital innovative financial instruments** that could enhance access to finance for MSMEs, SMEs, and Start-ups as well as new instruments to support the Member States' priorities, which are driving the investment agendas of IFIs / DFIs, the EU, and other stakeholders, including youth, sectorial priorities
- **Disseminate industry best practices and use cases** for technology adoption and uptake, data governance, and change management. Define KPIs for monitoring and

49 https://www3.weforum.org/docs/WEF_National_AI_Strategy.pdf

assessing the scalability of solutions across different levels and sectorial use cases. **Indicator:** A yearly brochure by SADC pointing at the successful sectorial use cases deployed in SADC MS

Strategic response matrix

DTS Strategic intervention: Developing capacities and improving readiness for digital adoption			
DTS ACTIONS	**OUTPUT**	**OUTCOME**	**IMPACT**
• **Develop a digital policy and strategy planning toolkit** adapted to the SADC context, for updating National Digital Agendas and mainstreaming digital into sectorial policies (including, health, agriculture, education, culture, tourism, etc) • P**rovide technical assistance and training** to MS to **build national Digital agendas and Sectorial Digital Strategies/Plans** (in areas such as health, agriculture, education, culture, tourism, digital / data-driven economy and 4th IR) • Implement a **platform** for **regional cooperation** on **digital transformation, including** peer **learning, support and dissemination** of good sector digital practices among SADC MS officials (all areas including health, agriculture, education, culture, tourism, and economy) • **Develop a shared regional advance digital competency and certification framework** (data science, AI, software, IoT, sys engineers, Analytics, etc) • TA and capacity building to **support MS to adopt and**	• SADC MS have access to **support, technical assistance, tools, blueprints training, to design and implement National Digital Agendas and Sectorial** digitalisation strategies and plans • Member States' capacities are strengthened for digital policies **design, mainstreaming and implementatio**n in all sectors • An advanced **regional digital competency and certification framework** is designed and MS are supported to adopt it • SADC MS have designed national Demand and Supply Gap strategies **to retain advanced Digital Skills** • SADC MS have designed **Digital Technology Entrepreneurship and Innovation** strategies that enable academia-private-public partnerships in innovation, technology transfer	• National Digital transformation **agendas adopted and being implemented,** • in all SADC MS digital is effectively **mainstreamed across all sectors** e-Edu, e-health e Agri etc) with proper **strategies** and capacities • There is sufficient **availability of advanced technical skills certified** and able to work seamlessly **across the region**	• Economic growth and digitally driven gains of **productivity and/or efficiency in all sectors** (public services, gov, culture, education, agriculture, industry) driven by data-driven models and digital technologies • Growth of the digital economy, **4th IR and digital goods and services** sector

implement the regional **harmonised regional advance competency** and certification framework • Support SADC MS to design national **Demand and Supply Gap strategies in Advanced Digital Skills** • **Develop and make available to MS regional harmonised training programs** for **Digital Technology Entrepreneurship and Innovation** (with Public and Private Partnerships) • Monitor SADC **regional trends on Sectorial Digital maturity** and adoption within the Member States' sectors (inclusion of all aspects) (**regional ICT/DT observatory**)	• MS are **implementing functional pilot projects** in sectors, such as agriculture (eAgriculture), energy (eEnergy), governance (eGovernance), health (eHealth), climate change (climate services), and Security Operation Centre (SOC) using Big Data, Artificial Intelligence (AI), and Internet of Things (IoT); • A **regional Model Framework to enhance capacities** and skills in emerging and advanced technologies are developed • **Data, use cases**, and best practices are available • **Monitoring digital adoption progress** and assessing the **scalability** of **digital solutions adapted to the SADC c**ontext across different sectors.		

4.4 E/Digital Government as a driver of government efficiency and the digitalisation of the economy

The SADC region has sought to develop further policies on e/digital-government and digitalisation that may be adopted and adjusted to suit the local contexts of individual countries. This means Digital Government (DG) strategies and plans have been developed at the continental level (ex. Smart Africa Initiative), regional level (ex. the Regional Infrastructure Development Master Plan – a more general ICT Plan where DG Strategy is inserted) and national level (only Comoros does not have a Digital Government Strategy among the 16 SADC MS). Nevertheless, according to the UN E-Government Development Index, only three countries (Mauritius, Seychelles, and South Africa) are among the top 100 countries in terms of overall EGDI ranking, with values above the global average of 0.60, and only 6 of them are part of the high EGDI group (Mauritius, Seychelles, South Africa, Namibia, Botswana and Zimbabwe), while the remaining 10 SADC MS belong to the middle EDGI group. The World Bank Report on GovTech confirms UN findings since, for the SADC region, only South Africa

belongs to the highest group (Group A). Mauritius and Tanzania follow in Group B while 11 countries (Angola, Botswana, Eswatini, Lesotho, Madagascar, Malawi, Mozambique, Namibia, Seychelles, Zambia, and Zimbabwe) belong to Group C. Comoros and the Democratic Republic of Congo are part of Group D. Participation rates are below the world average (Citizen Engagement Index – CEI - and E-Participation Index – EPI -) for most of the SADC countries (South Africa and Tanzania are exceptions according to CEI and South Africa and Mauritius according to EPI), that also lack a website for citizen participation (13/16) and a national website for Citizen Feedback, Grievance Redress Management (GRM) and Government Responsiveness (11/16). Malawi, Seychelles and South Africa are the only SADC Member States that have an Open Government Initiative in place. Regarding an Open Data website, all the SADC MS except Comoros have one. Almost all of them are only for information but Mauritius distinguishes itself by providing access to open data. Regarding E-ID initiatives, 10 out of the 16 SADC Member States (Angola, Botswana, Lesotho, Malawi, Mauritius, Seychelles, South Africa, Tanzania and Zambia) have electronic national ID (at least partially), while another five Member States (Comoros, Eswatini, Mozambique, Namibia and Zambia) have national ID (at least on card) which is not E-ID. No digital identity initiatives were identified for DRC and Madagascar.

This serves to show how there are challenges in the implementation of e/digital-government services and initiatives that need to be addressed.

- Ensure that all SADC MS have comprehensive Digital Government (DG) policy guidelines in place that set the principles, models, and standards needed for efficient and effective implementation of e-governance (including data protection, cybersecurity, privacy laws etc.), developed in line with a common regional framework;
- Ensure that all SADC MS can rely on national services that are delivered online and take into account citizens' feedback and needs while also providing tools that can be used at the regional level, such as national digital identity systems that are recognised and accepted in all SADC MS;
- Ensure that in all SADC MS both providers and users have the necessary expertise to take full advantage of e/digital-government infrastructures and processes through education in digital skills and literacy whose minimum requirements are set at the regional level;
- There is a regional collection of usage data for these services so they are further improved throughout the years.

For this response strategy to work, it is expected that **SADC MS commit and align the national DG strategy with a broader regional framework set by SADC**.

In addition, the **implementation of their national e/digital government plan** should include:

- Provide support, including training, and guidelines to local authorities in their efforts toward government digitalisation;
- Address the reluctance and opposition to e/digital-government systems which stem from stigma and misconceptions because a) electronic communication methods-government is a relatively recent concept that refers to the shift from manual labour to electronic methods of work in the workplace and b) many view the introduction of e/digital-government as a threat to their jobs and authority and are fearful of losing them;
- Incorporate the local government's e-governance strategic plan into the national budget to enable adequate financing for local authorities, which includes the installation of ICT infrastructure and infrastructure;
- Increase awareness of the benefits and importance of DG among citizens and public workers;
- Create/improve channels that allow citizens to actively participate and provide feedback on their level of satisfaction and needs to be addressed;

- Widen/improve the provision of government services that can be accessed electronically;
- Provide secure digital identity and digital signature to safely access e-services;
- Assure e-inclusion of minorities and ethnic groups by providing tailored services;
- Provide up-to-date information easily and intuitively;
- Promote interoperability of governmental systems, in particular between e-services providers (e-social security, e-finance, e-citizenship, among others);
- Ensure transparency in data collection and usage as well as open access to data, together with the secure exchange of data information on interconnected management systems;
- Comply with regional and international legal and regulatory frameworks related to e/digital-government issues and adapt national legislation accordingly;
- Liaise with the private sector to leverage their expertise

The goal of this strategic intervention is to ensure that **Digital Government** by 2030 in SADC MS is fully implemented.

Targets indicators by 2030 are:

- **All SADC MS public institutions have digitalised their operations and are proving digital services** managed in compliance with privacy and security requirements, have the necessary trained and competent professionals, ensuring full maintenance and operability of infrastructures and full support to citizens, with special attention to marginalised groups and communities.
- 90% of national MS digital government plans/agendas KPIs achieved.
- EDGI scores have improved to the average world level for all MS.

To achieve this **SADC DTS Implementation will**:

- Provide a SADC regional framework on digital government for local and national digital strategies of SADC MS;
- Provide a regional legal and regulatory framework on issues related to e/digital-government implementation, in line with continental and international efforts;
- Provide systems of regional integration that stem from and are aligned with national e-services and tools, such as regional digital identity integration that ease movement (of people and goods) within SADC MS;
- Provide up-to-date information easily and intuitively on SADC's role in the digital government transitions that is occurring in MS;
- Collect data on DG in SADC MS and provide annual reports on the status of DG from a national and regional point of view as well on recommendations and future challenges;
- Ensure that data are transparent, up-to-date and easily accessible as well as standardise in a way that allows for national, regional and international comparison and assessment;
- Offer a common platform for peer learning and best practices among SADC MS in digital government

This will be **done through the following actions**:

- Definition of a strategic framework for improving E-Government and Digital Government (EDG) in the SADC region (models for national e/dig-gov policy, laws regulation, implementation guidelines, collaborative regional EDG actions);
- Creation of an E-Government and Digital Government (EDG) Regional Agency (it will aim to support and improve cooperation between e-government national agencies, training, manage regional data centres, and relevant regional digital services);
- SADC to support the MS in their E-Government and Digital Government (EDG) and capacity-building efforts via the set-up of Public-Private Sector Partnerships (PPP);
- Provide training and support to MS for the implementation of EDG;

- Support the deployment of special services and digital infrastructures to implement MS national e/digital government services for MS that need it
- Support the development of regional data exchange and the interoperability of SADC MS government services and systems at regional level (including transports, customs, security agencies, regional ID checks, etc).

That should translate into this set of outputs

- Regional EDG model policy, laws and regulations, and implementation guidelines made available to all MS;
- National Capacities developed for EDG implementation in MS;
- MS institutions and officials actively collaborating to support EDG implementation;
- Regional digital infrastructure platform to develop, support and implement MS national EDG services
- Regional benchmarking of SADC MS EDG and case studies published regularly;
- Encourage MS to engage with the private sector for efficient implementation of e/digital-government systems
- SADC and MS have developed a **comprehensive and interconnected regional e-governance strategic plan** that relies on synergies between local and national and regional authorities;
- MS have implemented (with SADC support) their national e/digital government strategies that include, among other:
- governmental services at local and national levels delivered electronically, in compliance with privacy and security laws;
- national data management system;
- interactive, easy-to-use, complete, inclusive, updated and open national websites for information and e-services providers;
- the upskilling of the existing workforce/creation of new job figures to interact with electronic services and facilities at all levels;
- implementing maintenance plans for infrastructures at the local and national levels for them to not deteriorate or become obsolete;
- development of helpdesks at local and national levels (both physical – inserted in public authorities' facilities - and online) to assist the population in the use of e-services and grant them access to a computer and internet connectivity;
- development of partnerships with the private sector to be able to improve the delivery of e/digital-government services by leveraging on the private sector's expertise and agility to put new and always up-to-date systems into place.

For the 2-year SADC DTS action plan 2023-2025, the expected outcomes and KPIs are:

- All SADC MS implementing comprehensive sound EDG policies aligned on a common regional framework by 2030 (including implementing digital services, training, etc).
- Key National MS EDG services and apps are regionally interconnected / regionally exchanging data using the regional platform.
- Regional EDG services and applications developed as per plan.

DTS Strategic intervention 4: E/Digital-Government as a driver of government efficiency and the digitalisation of the economy			
ACTIONS (by DTS)	**OUTPUT**	**OUTCOME**	**IMPACT 2030**
• Definition of a **strategic framework for improving E-Gov and Digital Government (EDG) in the SADC region** (set of models for national e/dig-gov policy, laws regulation, implementation guidelines, collaborative regional EDG actions) • Creation of an **E-Gov and Digital Government (EDG) Regional Agency** (will support, improve cooperation between e-gov national agencies, training, manage regional data centre, and relevant regional digital services) • SADC to support the MS in its E-Gov and Digital Government (EDG) and capacity-building efforts through the set-up of **Public-Private Sector Partnerships (PPP)** • Provide **training and support** to MS for the domestication and implementation of EDG nationally • **Support/host or provide special services** and digital infrastructures to **implement MS national e/digital gov services** for MS that need it (PKI, etc) • **Support the development of regional data exchange** and the **interoperability of SADC MS gov services** and systems at regional level (including transports, customs, security agencies, regional IDs checks, etc) • **Regularly** collect standard **data and meta-data on EDG in MS gov** services and disseminate	• Regional EDG **model policy, laws, regulation**, and implementation **guidelines** on **available for domestication** by MS • **National Capacities developed** for EDG implementation in MS • MS institutions and officials **actively collaborating** to support their EDG national implementation • Is in place a **regional digital infrastructure platform** to develop, **support and implement MS national EDG services** – that don't have their own inf. And can now catch up with the other MS • **Regional** EDG activities **identified and planned** (as interconnecting national EDG services and regional data exchange) • Regional **benchmarking** of SADC MS EDG and **case studies** are published regularly	• All SADC MS **implementing comprehensive sound EDG policies aligned** on a common regional framework by 2030 (including implementing digital services, training, etc) - • Key National MS **EDG services and apps regionally interconnected** / regionally exchanging data using the regional platform • R**egional EDG services** and applications **developed** as per plan	• **Enhanced gov efficiency, universal access to public services,** delivered digitally and enhanced governance • Digital government is a **driver in digitalisation for the society** and the SADC economies • **Regional integration and regional single market are facilitated** by interconnected and interoperable digital services

4.5 Digital skills for all SADC citizens

There is a significant digital skills gap among the general population in the region. Many factors are at play as some MS do not have policies in place to promote digital skills among the population and others have uncoordinated activities, led by different actors, or incoherent/insufficient to fully address current digital literacy needs. Key indexes, such as the Global Competitiveness Index, show that SADC MS generally score below the medium values considered. In addition, the use of proprietary software requires significant levels of investment, because of the major costs of this type of software, and while most countries have a government plan or strategy regarding digital literacy for students and training for teachers, some are outdated and not fully addressing current needs.

The SADC DTS strategic response will aim to:

- Ensure that basic digital literacy is held by the majority of the population (>80%).
- Foster advanced digital among the young population.

For this response strategy to work it is expected that **SADC Member States (MS) commit and align national Digital Skills strategies with a broader regional framework set by SADC**.

In addition, for the strategy to be effective, **SADC Member States (MS) should commit to:**

- Create country-specific action plans.
- Develop inclusive policies and regulatory frameworks that aim to facilitate the acquisition of digital tools and devices.
- Accelerate curricula reform concerning digital literacy at all educational levels, including for workers who want to upgrade their skills.
- Expand and improve the use of technology for teaching and learning.
- Modernize Campus Networks and IT infrastructure.
- Monitor digital literacy progress in the region based on national data.

The target of this strategic intervention is that by 2030, the SADC population is **Digitally Skilled**. Targets by 2030 include that:

- 50% of formal labour force has basic digital skills;
- 80% of youth have basic digital skills;
- 90% of public sector employees have basic digital skills;
- 50% of youth have advanced digital skills;
- A common regional digital skills and competencies framework is in place.

To achieve this the SADC DTS implementation will:

- Develop ICT skill model policies that consider operational costs (making the costs bearable for the majority of the populations, particularly rural, through financial benefits).
- Create conditions for private sector investment through the establishment of public-private partnerships (PPP) to deploy ICT infrastructures across the country.
- Update digital literacy strategies considering current digital literacy needs and digitalisation trends.
- Create partnerships with technological companies, preferably from the region, to more effectively deliver digital tools.
- Promote a wider use of Open Education Resources (OERs) in education institutions at all levels.

This will be done through actions that will:

- Support to the MS in developing policies and actions plans on digital literacy (basic to medium skills) covering the private labour force, public sector employees and NEET (not in employment, education or training) youth;
- Establishment of the SADC Digital Competences / Skills Framework to support MS in updating their national curricula on digital skills and increasing funding for digital literacy initiatives, and assessing/monitoring digital skills;
- Technical advisory on updating the national curricula to better address digital avenues;
- In collaboration with the MS, promote regional-wide training programmes to train highly specialised digital professionals in the public sector and SADC entities;
- Leverage the collaboration with National Research and Education Networks (NRENS) and UbuntuNet alliance to foster digital literacy at all education levels and develop political models for establishing regional connectivity;
- Increase domestic and external funding for initiatives on improving digital skills, building on the identification of best practices from other relevant projects across Africa;

That should translate into this set of outputs:

- All SADC MS have policies on digital literacy and plans to increase massively their population's digital literacy
- All SADC MS have received support to develop their capacity to implement these plans;
- All SADC MS have received support (TA and training)
- Partnerships with donors and other key actors have been set up to support MS in implementing these plans, including for curriculum, teachers training, infrastructure;
- Existing NRENS have received support to foster greater capacity to contribute to progress in digital literacy in the region;
- Progress in digital literacy is monitored in all MS including disaggregated data for gender, age, setting (urban/rural) and socio-economic profile;

For the 2-year SADC DTS action plan 2023-2025, the expected outcomes and KPIs are:

- Considerable number of digital literacy programs have been implemented in all MS;
- Curriculum revisions have been updated to fully address national digital literacy needs. They should englobe: education of ICTs in schools, communities and workplaces;
- Common regional digital skills and competencies framework is in place;
- Schools and students are better equipped to use digital tools and devices for teaching, learning, connectivity and IT infrastructure in schools are improved

DTS Strategic intervention 5: Digital skills for all SADC citizens			
ACTIONS	**OUTPUT**	**OUTCOME**	**IMPACT**
• Support to the MS in developing **policies and action plans on digital literacy** (basic to medium skills), covering the private labour force, public sector employees and NEET (not in employment, education or training) youth • Establishment of the **SADC Digital Competencies / Skills Framework** to support MS in updating their national curricula on digital skills and increasing funding for digital literacy initiatives, and asses/monitor digital skills • Technical **advisory on updating the national curricula** to better address the digital avenues • In collaboration with the MS, **promote regional-wide training programmes** to train highly specialised digital professionals in the public sector and SADC entities. • **Leverage the collaboration with National Research and Education Networks (NRENS)** and the UbuntuNet Alliance **to foster digital literacy** at all education levels and develop political models for establishing regional connectivity. • Increase **domestic and external funding for initiatives on improving digital skills**, building on the identification of best practices from other relevant projects across Africa • Support MS in **monitoring digital literacy progress** in the region (Observatory)	• All SADC MS **have policies on digital literacy** and **plans to increase massively** their population's **digital literacy** • All SADC MS have **received support to develop their capacity to implement** these **plans** • All SADC MS have **received support** (TA and training) **to adopt the common SADC Digital Competencies / Skills Framework i**ntegrated into their national competencies frameworks • **Partnerships with donors and other key actors** have been set up to support MS in implementing these plans, including for curriculum, teachers' training, and infrastructure. • Existing **NRENS have received support** to progress in digital literacy in the region. • **Progress in digital literacy is monitored in all MS including** disaggregated data for gender, age, setting (urban/rural) and socio-economic profile	• **Massive digital literacy programs have been implemented in all MS** • **Curriculum revisions** have been updated to fully address national digital literacy needs for the education of ICTs in schools, communities and workplaces • A **common regional digital skills and competencies framework is in place.** • Schools and students are better **equipped to use digital tools and devices** for teaching and learning, connectivity and IT infrastructure in schools are improved.	• Digital Skills: SADC population is Digitally Skilled. Targets by 2030 include that: • 50% of formal labour force has basic digital skills; • 80% of youth have basic digital skills; • 90% of public sector employees have basic digital skills; • 50% of youth have advanced digital skills;

4.6 Supporting research to enable digital innovation, emerging technologies and 4IR in SADC

To increase and strengthen research to enable digital innovation, emerging technologies and 4IR in the SADC region, two strategic action lines have been identified as key priorities for the DTS:

- Promoting research for digital innovation by increasing funding mechanisms and encouraging open access and dissemination
- Strengthening linkages and synergies in digital innovation research ecosystems, namely to address the gender gap in the sector

4.6.1 Promoting research for digital innovation by increasing funding mechanisms and encouraging open access and dissemination

Investment is needed to design, implement and monitor research programmes (including collaborative programmes), support knowledge transfer to the private sector, establish partnerships within and outside the regional ecosystem, acquire and build R&I infrastructure and resources for digital innovation, emerging technologies and 4IR. The need to obtain high-performance computing solutions (cloud-based services, machine learning devices, data analytics platforms, etc.), namely to allow the simulation of test scenarios, is a compelling need for researchers in various fields. It is necessary to increase regional and joint efforts to create systems that can collect, process and analyse large quantities of data. Joint efforts will also address the siloed approach, which is often seen within the regional landscape in terms of research agendas and programmes, and the sharing of infrastructures and resources. Indeed, research capacities in the region are greatly impaired by data inaccessibility, but also because of the disconnection from important research networks outside the continent. Access to research outputs, which are used either as complements or as the basis for new research, is key to a thriving research ecosystem. The significant disparities in global research collaboration are directly associated with the disparities in funding, as Africa is still too dependent on funding from high-income countries. As a result, many research agendas pursued by African researchers are defined outside of Africa (even though the research itself targets or is done in Africa) and, second, African researchers are often approached as local researchers (i.e., contributors) and rarely as core researchers. Both these issues have very negative consequences for the overall image of the region regarding research capacities and infrastructural accessibility.

DTS action objectives

- Ensure that the regional research landscape has access to enough funding and investment to progress in digital innovation in line with other countries from the Global South and North.
- Ensure that emerging technologies and technology transfer generate societal impact, in line with Agenda 2063 and Agenda 2030.
- Improve the capacity of researchers from the region to access data and other digital research outputs, scientific journals, networks and research events, in and outside the African continent.
- Promote fair and equitable practices in digital research collaborations in and outside of Africa, assuring the research integrity of the SADC region.

For this response strategy to work it is expected that **SADC Member States (MS) commit and align national research strategies with a broader regional framework set by SADC**.

In addition, for the strategy to be effective, **SADC MS should commit to:**

- Set up National Foundations for Research and Innovation in the countries where they do not yet exist.
- Support the National Foundations for Research and Innovation to establish effective digital research management practices and research agendas, and to cooperate between them, including via digital means.
- Increase the availability of funds for the various types of research and innovation entities in each MS (National Foundation, universities, research centres, tech hubs and innovation transfer entities), with a particular focus on digital innovation, emerging technologies and 4IR.
- Leverage effective cooperation with international funders focusing on digital innovation, ensuring alignment with national priorities and needs, the Agenda 2063 and Agenda 2030.
- Back well-coordinated and related research communities by funding the set-up of adequate digital communication channels.
- Innovate in funding mechanisms that associate the public, private and non-profit sectors to ensure research capacity for digital innovation and innovation translation/adaptation.
- Create (in the MS that do not have them yet) and improve (where they are already active) the capacities of National Research and Education Networks (NRENS) to further support the needs of research and education communities in terms of access to digital tools, data and scientific journals.
- Support open-science initiatives, highlighting the values of accountability, acknowledgement, diversity and inclusivity.
- Increase the capacity of regional universities to create and maintain high-performing websites and online repositories where research from those universities is allocated and publicly available (or available upon request, as adequate).
- Support universities in acquiring access rights to key research platforms, channels and online journals. Support should be financial but also through diplomatic efforts that emphasise the dimension of the untapped African ecosystem and the growing number of young researchers in African universities.

The SADC DTS implementation will:

- Support the MS in their effort to improve the capacities of their National Foundations for Research and Innovation regarding accessing funding and promoting open access practices.
- Work with the MS and international funders to guarantee that the region has access to consistent, sufficient, relevant and sustainable funding for research and innovation.
- Scale-up, within the region and beyond, successful high-performance computing solutions developed in local universities.
- Strengthen the research-policy interface through more consultative processes between decision-makers and research professionals with regard to open access and scientific communication practices.
- Support regional research communities, namely through the CoE, that can push for further recognition and valorisation of the regional researchers, research institutions, outputs and methodologies.
- Support the MS in accessing funding for the development of academic physical and virtual infrastructure and resources used for academic research dissemination.

This will be done through the following actions:

- Support MS to increase domestic and external funding in digital innovation, emerging technologies and 4IR.
- Support and strengthen existing NRENs and establish new ones.

- Develop a Regional Open Access Framework to support MS and universities in acquiring licenses to access the main global research journals and platforms.
- Support the implementation of the Regional Open Distance Learning (ODL) Strategic Plan 2022-2030 for universities in the region to build new or improve their physical and virtual infrastructure and resources relevant for dissemination purposes.

That should translate into this set of outputs:

- MS relevant agencies have developed plans and means to mobilise new funding sources for research and digital innovation, emerging technologies and 4IR.
- Existing NRENs have a greater capacity to ensure research integration across the region.
- New NRENs are set-up in the countries where they did not exist.
- Universities in MS implement the Regional Open Access Framework and acquire licenses to access the main global research journals and platforms.

Regional Open Distance Learning (ODL) Strategic Plan 2022-2030 is implemented. For the 2-year SADC DTS action plan 2023-2025, the expected outcomes and KPIs are:

- Universities across the region have, as a whole, built new or improved their infrastructural capacity and assured access to important open-access platforms.
- NRENs and universities from the region work collaboratively to move forward with research integration in the fields of digital innovation, emerging technologies and 4IR.

Strategic intervention: Promoting research for digital innovation by increasing funding mechanisms and encouraging open access and dissemination			
ACTIONS	**OUTPUT**	**OUTCOME**	**IMPACT:**
• Support MS to **increase domestic and external funding** in digital innovation, emerging technologies and 4IR. • Support and strengthen **existing NRENs** and establish **new ones**. • Development of a **Regional Open Access Framework** to support MS and universities in acquiring licenses to access the main global research journals and platforms. • Support the **implementation of the Regional Open Distance Learning (ODL) Strategic Plan 2022-2030** for universities in the region to build new or improve their physical and virtual infrastructure and resources relevant for dissemination purposes.	• MS relevant agencies have developed plans and means to **mobilise new funding sources for research and digital innovation**, emerging technologies and 4IR. • Existing **NRENs have a greater capacity** to ensure research integration across the region. • **New NRENs are set-up** in the countries where they did not exist. • Universities in MS **implement the Regional Open Access Framework** and acquire licenses to access the main global research journals and platforms. • Regional Open Distance Learning (ODL) Strategic Plan 2022-2030 is implemented.	• Universities across the region have, as a whole, built new or improved their infrastructural capacity and assured access to important open-access platforms. • NRENs and universities from the region work collaboratively to move forward with **research integration in the fields of digital innovation**, emerging technologies and 4IR.	• Across the region, the quality and quantity of research in digital innovation, emerging technologies and 4IR is visibly improved.

4.6.2 Strengthening linkages and synergies in digital innovation research ecosystems to address the gender gap in the sector

The research landscape across the SADC region is fragmented, limiting the possibility of organisations creating synergies and benefiting from each other's efforts. Fragmentation is visible not only in the regional research ecosystem as a whole but also within countries. The lack of private sector engagement strategies is particularly noticeable. The general lack of cooperation between the private sector and academia is the core reason behind the disassociation seen in the supply-demand dynamics between both. Currently, the regional industry is not able to absorb many of the graduated students from SADC universities and, at the same time, the education system is not offering the training/skills demanded by the regional market.

Concerning the gender gap in the sector, at the MS's level, the policy support to engage women in STEM education is very low. Only two MS (Malawi and Zambia) have government policies in place to encourage women and girls to study STEM. While gender parity in research in general and digital-related fields, in particular, has seen improvements, the current numbers fall short of the roughly 50%, expected in a gender-balanced research environment. Furthermore, the topic is all the more worrisome as data shows a high dropout percentage of women in STEM education programmes, showing that women engage in those programmes but end up not succeeding, which is also reflected in women's participation in digital innovation and emerging technologies. A digital innovation research ecosystem should therefore address gender inequality in the field.

DTS action objectives

- Increase the connection between industry and academia in the region.
- Ensure that the regional industry can absorb graduated students, to halt the brain drain in the region.
- Halt the 'leaky pipeline' phenomenon leading to few women in careers and education programmes related to digital innovation and emerging technologies.

For this response strategy to work it is expected that **SADC Member States (MS) commit and align national research strategies with a broader regional framework set by SADC**.

In addition, for the strategy to be effective, **SADC MS should commit to:**

- Set up consultation processes involving academia and the industry/companies.
- Support the academia to respond to the skills needed by the labour market, nonetheless avoiding a competitive environment where some fields, degrees and universities are more valued than others – heterogeneity enriches ecosystems.
- Avoid siloed dialogues (i.e., a department focusing on a field collaborates only with the companies in the same field) and support interdisciplinarity across the regional and national ecosystems.
- Support local enablers of research transfer and innovation adoption such as tech hubs and incubators.
- Support the diversification of national economies and industrial bases to enable workforce from different fields to integrate into the labour market.
- Require international corporations to bridge the wage gap for local and foreign workers with similar capacities.
- Create incentives for international corporations to hire more than 80% of their workforce locally (i.e., from the country where they are established) and/or 50% or more local workers in managing positions.

- Improve access to quality pre-tertiary education to ensure students learn and acquire the skills needed to advance in STEM disciplines at the higher education level if they so wish (this includes skills in Maths, Science and digital skills).
- Ensure that pre-tertiary education is supported by gender-responsive curricula in STEM education.
- Create incentives for industry and research entities in the digital field for hiring women.
- Reinforce the links between public schools (particularly in those serving disadvantaged communities) and non-profit entities working in the education sector with a focus on technology and digital tools provision and use.
- Monitor short-, medium- and long-term progress regarding the number of girls pursuing higher-education programmes focusing on digital innovation, emerging technologies and 4IR.

The SADC DTS implementation will:

- Rely on the infrastructural and resource capacity of the SADC Centres of Excellence (CoE) related to digital innovation, emerging technologies and 4IR to connect the universities and research centres across the region.
- Support greater connectivity between academia and industry in the digital area, across the region, based on the SADC Industrialization Strategy and Roadmap 2015-2063.
- Create mobility opportunities for students, researchers and professionals dedicated to digital innovation, emerging technologies and 4IR, ensuring a better-connected research landscape in these areas.
- Factor and monitor research outcomes, productivity and societal impact (based on national data) as central metrics of development and collaboration in the regional research landscape in the areas of digital innovation, emerging technologies and 4IR.
- Support the MS in developing learning expeditions and exchange programmes to ensure regional integration and peer-learning in mentorship and hands-on training opportunities for girls in digital innovation, emerging technologies and 4IR.
- Create a regional support programme to close the gender gap in digital skills, emerging technologies and 4IR.
- Support the MS in expanding successful women/girls in digital careers initiatives.
- Foster and establish international partnerships between universities in the SADC region and universities in other African regions developing digital-centred programmes, as well as universities outside the continent (particularly research institutes led by or with a significant

This will be done through the following actions:

- Support regional academia-industry and field-focused regional events with a focus on digital innovation, emerging technologies and 4IR.
- Support to universities in the region to foster linkages with the private sector in the areas of digital innovation, emerging technologies and 4IR.
- Set up a network of Centres of Excellence (CoE) related to digital innovation, emerging technologies and 4IR.
- Support and increase human capital development on digital innovation, emerging technologies and 4IR by increasing mobility initiatives across the region for students.
- Monitor digital innovation, research and digital entrepreneurship (Observatory).
- Establish a regional support programme to close the gender gap in digital skills, emerging tech and 4IR, and to encourage women-led digital entrepreneurship.
- Set up a mechanism within the Regional Development Fund (RDF) for closing the gender gap in digital innovation, emerging technologies, 4IR and digital entrepreneurship.

- Support MS in providing sex-disaggregated data on advanced digital skills, emerging technologies and 4IR (Observatory).

That should translate into this set of outputs:

- Academia-industry collaboration agreements on digital innovation, emerging technologies and 4IR are signed and implemented, envisaging namely the organisation of regional events.
- A regional network of CoE dedicated to digital innovation promotes the integration and cohesion of the regional research landscape in this field.
- Mobility initiatives are implemented across the region for students, researchers and professionals in the areas of digital innovation and research.
- SADC has supported the MS in developing programmes to close the gender gap in digital innovation, emerging tech and 4IR, and to encourage women-led digital entrepreneurship.
- Funding from the RDF is used by MS to put in place initiatives that address the gender gap in digital innovation, emerging technologies and 4IR.
- Through the regional observatory, the gender gap in digital innovation across SADC is monitored and continuously addressed.

For the 2-year SADC DTS action plan 2023-2025, the expected outcomes and KPIs are:

- SADC supports the organisation of academia-industry regional events from 2024 onwards.
- SADC releases a regional academia – private sector engagement strategy on digital innovation, emerging technologies and 4IR to guide MS in their efforts of narrowing the gap between the work of universities and that of the private sector.
- The CoE working on digital innovation, emerging technologies and 4IR promote regional integration and cohesion in research in these fields, across the region.
- There is a better alignment between the academic offer in universities across MS and the regional market/industry demand in terms of skills, qualifications and research & innovation.
- The mechanism set-up within the RDF to close the gender gap in digital innovation funds MS initiatives in this area.

Strategic intervention: Strengthening linkages and synergies in digital innovation research ecosystems, to address the gender gap in the sector			
ACTIONS	**OUTPUT**	**OUTCOME**	**IMPACT:**
• Support regional **academia-industry and field-focused regional events** with a focus on digital innovation, emerging technologies and 4IR. • Support to **universities in the region to foster linkages with the private sector** in the areas of digital innovation, emerging technologies and 4IR. • Set up a network of Centres of Excellence (CoE) related to digital innovation, emerging technologies and 4IR. • Support and increase **human capital development** on digital innovation, emerging technologies and 4IR by increasing mobility initiatives across the region for students. • **Monitor** digital innovation, research and digital entrepreneurship (Observatory).	• **Academia-industry collaboration agreements** on digital innovation, emerging technologies and 4IR are signed and implemented, envisaging namely the organisation of regional events. • A **regional network of CoE dedicated to digital innovation** promotes the integration and cohesion of the regional research landscape in this field. • **Mobility initiatives** are implemented across the region for students, researchers and professionals in the areas of digital innovation and research.	• SADC supports the organisation of academia-industry regional events from 2024 onwards. • SADC releases a ***regional academia – private sector engagement strategy*** *on digital innovation, emerging technologies and 4IR* to guide MS in their efforts of narrowing the gap between the work of universities and that of the private sector. • The CoE working on digital innovation, emerging technologies and 4IR **promote regional integration and cohesion in research in these fields**, across the region. • There is a better alignment between the academic offer in universities across MS and the regional market/industry demand in terms of skills, qualifications and research & innovation.	• **Digital innovation shows a significant increase and improvement** across the region. • **Emerging technologies and 4IR become areas of growing importance and investment** both in universities and the private sector. • The **work of the CoE dedicated to digital innovation is visible and key** to universities and private-sector research efforts.
• Establish a **regional support programme to close the gender gap** in digital skills, emerging tech and 4IR, and to encourage women-led digital entrepreneurship. • Set up a **mechanism within the Regional Development Fund (RDF) for closing the gender gap** in digital innovation, emerging technologies, 4IR and digital entrepreneurship. • Support MS in providing **sex-disaggregated data** on digital skills, emerging technologies and 4IR (Observatory).	• SADC has supported the MS in developing **programmes to close the gender gap** in digital innovation, emerging tech and 4IR, and to encourage women-led digital entrepreneurship. • **Funding from the RDF** is used by MS to put in place initiatives that address the gender gap in digital innovation, emerging technologies and 4IR. • Through the regional observatory, **the gender gap in digital innovation across SADC is monitored** and continuously addressed.	• The number of programmes and initiatives targeting gender equality in digital innovation increased significantly across the region. • The **mechanism set-up within the RDF** to close the gender gap in digital innovation funds MS initiatives in this area.	• **Gender equality in research and scientific careers** in the areas of digital innovation, emerging technologies and 4IR is achieved by 2030.

4.7 The SADC Digital Transformation (virtual) Observatory: monitoring, evaluating and learning

Establishing baselines, monitoring DTS implementation, benchmarking MS progress in all the strategic areas, evaluating outcomes and impacts downstream is key to having an efficient implementation. It will allow to scope and calibrate the DTS actions correctly, identify best practices and failures, learn and share lessons across MS, and adjust the course of the DTS accordingly.

The SADC ICT observatory was started by the SADC secretariat as one of the flagship projects of the SADC Regional Infrastructure Development Master Plan (RIDMP) to monitor and evaluate the implementation of the SADC ICT Programme, Sustainable Development Goals (SDGs), the Digital Divide and enhancing Industrialisation in SADC through ICT[50].

The DTS will expand its scope to become the **SADC Digital Transformation (virtual) Observatory** whose function is to asses all aspects of digital transformation in the SADC region, and DTS implementation, including:

- ICT **infrastructure, c**overage, adoption and digital inclusion, affordability, connectivity **policies, markets, investments**
- **Digital transformation agendas** implementation, digital maturity & adoption in all **sectors** (education, health, agriculture, tourism, manufacturing, SMEs etc)
- **Digital regulations, data governance**, regional harmonisation, digital regional integration (single market), digital rights, freedoms and **cybersecurity**
- E- gov and **digital Gov**
- **Digital skills** (advanced/tech and basic digital literacy or all)
- Digitalisation of the **economies, SMEs**, value chains etc
- 4th IR / data/ICT sector Entrepreneurship in emerging technologies
- Digital innovation and research
- DT i**mpacts** of economies, social inclusion, **green and digital** (climate/environment) g**ender** (ad sex-disaggregated data across all areas)

The SADC Digital Transformation (virtual) Observatory has a double function of (1**) monitoring and evaluating the DTS implementation** (informing the DTS governance and implementation structures) and (2) **assessing permanently the SADC regions progress** in digital transformation. As a virtual observatory, it

- collects, systematizes and analyses data from a variety of sources,
- conducts **research and case studies** to be prepared by third parties and experts
- maintains a central web repository with data sets, an analytical dashboard, documents,
- **disseminate i**ts products externally through publications, newsletters, events, and open data.

[50] 62 Core Indicators were validated by Member States and were to be collected for 2021 covering several ICT Economic, Infrastructure and Connectivity, Access to Use of and Affordability of ICT, ICT policy and regulation, education and skills, e-services and ICT in business and technology, research and innovation are to be collected annually. capacity building for focal point persons on ICT Indicators was also undertaken

4.8 Summary of the 7 strategic interventions logic

Strategic intervention 1: Universal affordable access and inclusive adoption, supported by robust resilient and secure infrastructure			
ACTIONS	**OUTPUT**	**OUTCOME**	**IMPACT**
• **Mandate an implementing agency and design a regional support program** for enhancing MS national capacity to improve the design and implementation of connectivity policies, broadband plans, design and enforce the enabling regulations etc. • Design **model policies, provide TA to countries, trainings, capacity development, peer support, regional networking** and good practices exchange for MS connectivity policies, broadband plans, regulations etc. • Design a ***regional interconnectivity promotion program*** (to incentivise and attract private sector investment in cross-border and regional inf.) – program implementation targets, special regulations, financial facilities, and other incentives/activities TBD • **Feasibility study** and action plan design for SADC regional connectivity actions by SADC MS and interconnection of data infrastructures (determine if PPP, or purely public, resources used, Special Purpose/Project Vehicles or other models of implementation modalities etc) • **Implementation** of the regional connectivity programs and interconnection of data infrastructures (previous action/study will identify details) • **Design** and implement a regional program to **ensure the availability** of **affordable access devices** (study will determine if centred on reduction of the cost of import, of manufacturing/assembling devices in the region) (details TBD by study).	• Are designed SADC **model policies, design playbooks, and model regulatory tools for affordable broadband** and digital inclusion • MS have better **capacity and access to TA for national broadband plans design and implementation** of new regulatory frameworks • Regional and MS **progress is monitored and benchmarked**, and impact studied • Some regional **collaborative connectivity projects are designed** • **Policy** and regulatory **targeted Incentives to attract private sector** investments are designed at national and regional level • **Regional** backbone **interconnectivity promotion and incentives program** is implemented • Regional **network of interconnected IXPs with** CDNs/Data centres is in place • Implemented a **regional program of affordable access devices** (smartphone assembling or production)	• MS develop and **implemented effectively their national connectivity and rural broadband** plans or strategies resulting in network expansion, **more competition, better and affordable services** • Regional **backbones interconnected, resilient, redundant**, offering cheaper wholesale capacity • **Affordable services and devices** are available to all SADC citizens	• **Universal broadband coverage** of SADC's population and territory • **Universal Access and broadband adoption** are achieved among the SADC population. • **Gender gaps** in Internet use, mobile phone ownership and digital skills are closed (parity achieved) • **All** key Public services **institutions are interconnected** by 2030

DTS Strategic intervention 2: Updated and regionally harmonised legal and regulatory frameworks to enable full digitalisation			
ACTIONS	**OUTPUT**	**OUTCOME**	**IMPACT**
• **Prepare model laws** and digital regulations for SADC MS to adopt (data protection, data governance, privacy, cybersecurity, e-transactions, platform regulation, consumer protection, digital freedom, legal instruments prohibiting harmful actions) • **TA, training and support to MS** for the **domestication and implementation** of the model cyber laws, regulations and national data governance frameworks and i**mplement a platform** for **regional cooperation**, peer **learning, support and dissemination** of good regulatory practices among SADC MS officials (all areas including cybersecurity) • Develop a **regional SADC cybersecurity strategic plan** (collaborative regional actions) that will include (1) promotion ac**tions and TA to incentivise all MS to ratify** multilateral regulatory agreements as Malabo and Budapest conventions (2) **TA** capacity-building for building Computer national incident response teams (CIRTs) or (CERTs) in SADC MS and secure their cyber domains, (3) the regional **cybersecurity governance and coordination mechanisms** within SADC MS, and (4) the **Regional SADC CIRT** and a **Regional legal interoperability** mechanism	• **Regional model policy, laws, regulation, and implementation guidelines** related to digital are available for domestication by MS • **Capacities for digital regulation design and enforceme**nt implementation are developed in SADC MS • **Regional cybersecurity plan and collaboration mechanism** are approved activities identified and planned • MS a**ctively collaborating on national implementation**, on **the Regional SADC CIRT** and a **regional legal interoperability mechanism on digital**	• All **SADC MS have comprehensive sound National data privacy, Data protection, Data governance Cybersecurity, e-Transactions, and consumer protection laws** • All MS have ratified and domesticated **the AU Convention on Cybersecurity and Personal** Data Protection (Malabo Convention) and the Budapest convention). • Governance and coordination mechanisms within SADC MS are set and effective on **regional digital regulatory frameworks harmonisation** • Regional SADC national and regional **Cybersecurity response coordination capacity** strengthened • Computer incident response teams (CIRTs) or (CERTs) are coordinated and collaborating in the region	• SADC MS digital **regulatory frameworks** and effective enforcement, the **i**mproved cybersecurity, **create online trust and safety, enable digital innovation and incentivise investment in digital economy** • The enabling environment for **regional single digital market** is built

DTS Strategic intervention 3: Developing capacities and improving readiness for digital adoption			
DTS ACTIONS	**OUTPUT**	**OUTCOME**	**IMPACT**
• **Develop a digital policy and strategy planning toolkit** adapted to the SADC context, for updating National Digital Agendas and mainstreaming digital into sectorial policies (including, health, agriculture, education, culture, tourism, etc) • P**rovide technical assistance and training** to MS to **build national Digital agendas and Sectorial Digital Strategies/Plans** (in areas such as health, agriculture, education, culture, tourism, digital / data-driven economy and 4th IR) • Implement a **platform** for **regional cooperation** on **digital transformation, including** peer **learning, support and dissemination** of good sector digital practices among SADC MS officials (all areas including health, agriculture, education, culture, tourism, and economy) • **Develop a shared regional advance digital competency and certification framework** (data science, AI, software, IoT, sys engineers, Analytics, etc) • TA and capacity building to **support MS to adopt and implement** the regional **harmonised regional advance competency** and certification framework • Support SADC MS to design national **Demand and Supply Gap strategies in Advanced Digital Skills** • **Develop and make available to MS regional harmonised training programs** for **Digital Technology Entrepreneurship and Innovation** (with Public and Private Partnerships) • Monitor SADC **regional trends on Sectorial Digital maturity** and adoption within the Member States sectors (inclusion of all aspects) (**regional ICT/DT observatory**)	• SADC MS have access to **support, technical assistance, tools, blueprints training, to design and implement National Digital Agendas and Sectorial** digitalisation strategies and plans • Member States capacities are strengthened for digital policies **design, mainstreaming and implementatio**n in all sectors • An advanced **regional digital competency and certification framework** is designed and MS are supported to adopt it • SADC MS have designed national Demand and Supply Gap strategies **to retain advanced Digital Skills** • SADC MS have designed **Digital Technology Entrepreneurship and Innovation** strategies that enable academia-private-public partnerships in innovation, technology transfer • MS are **implementing functional pilot projects** in sectors, such as agriculture (eAgriculture), energy (eEnergy), governance (eGovernance), health (eHealth), climate change (climate services), and Security Operation Centre (SOC) using Big Data, Artificial Intelligence (AI), and Internet of Things (IoT); • A **regional Model Framework to enhance capacities** and skills in emerging and advanced technologies are developed • **Data, use cases**, and best practices are available **monitoring digital adoption progress** and assessing the **scalability** of **digital solutions adapted to the SADC c**ontext across different sectors.	• National Digital transformation **agendas adopted and being implemented,** • in all SADC MS digital is effectively **mainstreamed across all sectors** e-Edu, e-heath e Agri etc) with proper **strategies** and capacities • There is sufficient **availability of advanced technical skills certified** and able to work seamlessly **across the region**	• Economic growth and digitally driven gains of **productivity and/or efficiency in all sectors** (public services, gov, culture, education, agriculture, industry) driven by data-driven models and digital technologies • Growth of the digital economy, **4th IR and digital goods and services** sector

DTS Strategic intervention 4: Electronic and Digital Government (EDG) as a driver of government efficiency and the digitalisation of the economy			
ACTIONS (by DTS)	**OUTPUT**	**OUTCOME**	**IMPACT 2030**
• Definition of a **strategic framework for improving E-Gov and Digital Government (EDG) in the SADC region** (set of models for national e/dig-gov policy, laws regulation, implementation guidelines, collaborative regional EDG actions) • Creation of an **E-Gov and Digital Government (EDG) Regional Agency** (will support, improve cooperation between e-gov national agencies, training, manage regional data centre, relevant regional digital services) • SADC to support the MS in its E-Gov and Digital Government (EDG) and capacity-building efforts through the set-up of **Public-Private Sector Partnerships (PPP)** • Provide **training and support** to MS for the domestication and implementation of EDG nationally • **Support/host or provide special services** and digital infrastructures to **implement MS national e/digital gov services** for MS that need it (PKI, etc) • **Support the development of regional data exchange** and the **interoperability of SADC MS gov services** and systems at regional level (including transports, customs, security agencies, regional IDs checks, etc) • **Regularly** collect standard **data and meta-data on EDG in MS gov** services and disseminate (ICT observatory function)	• Regional EDG **model policy, laws, regulation**, and implementation **guidelines** on **available for domestication** by MS • **National Capacities developed** for EDG implementation in MS • MS institutions and officials **actively collaborating** to support their EDG national implementation • Is in place a **regional digital infrastructure platform** to develop, **support and implement MS national EDG services** – that don't have their own inf. And can now catch up with the other MS • **Regional** EDG activities **identified and planned** (as interconnecting national EDG services and regional data exchange) • Regional **benchmarking** of SADC MS EDG and **case studies** are published regularly	• All SADC MS **implementing comprehensive sound EDG policies aligned** on a common regional framework by 2030 (including implementing digital services, training, etc) - • Key National MS **EDG services and apps regionally interconnected** / regionally exchanging data using the regional platform • R**egional EDG services** and applications **developed** as per plan	• **Enhanced gov efficiency, universal access to public services,** delivered digitally and enhanced governance • Digital government is a **driver in digitalisation for the society** and the SADC economies • **Regional integration and regional single market are facilitated** by interconnected and interoperable digital services

DTS Strategic intervention 5: Digital skills for all SADC citizens			
ACTIONS	**OUTPUT**	**OUTCOME**	**IMPACT**
• Support to the MS in developing **policies and action plans on digital literacy** (basic to medium skills), covering the private labour force, public sector employees and NEET (not in employment, education or training) youth • Establishment of the **SADC Digital Competencies / Skills Framework** to support MS in updating their national curricula on digital skills and increasing funding for digital literacy initiatives, and asses/monitor digital skills • Technical **advisory on updating the national curricula** to better address the digital avenues • In collaboration with the MS, **promote regional-wide training programmes** to train highly specialised digital professionals in the public sector and SADC entities. • **Leverage the collaboration with National Research and Education Networks (NRENS)** and the UbuntuNet Alliance **to foster digital literacy** at all education levels and develop political models for establishing regional connectivity. • Increase **domestic and external funding for initiatives on improving digital skills**, building on the identification of best practices from other relevant projects across Africa • Support MS in **monitoring digital literacy progress** in the region (Observatory)	• All SADC MS **have policies on digital literacy** and **plans to increase massively** their population's **digital literacy** • All SADC MS have **received support to develop their capacity to implement** these **plans** • .All SADC MS have **received support** (TA and training) **to adopt the common SADC Digital Competencies / Skills Framework i**ntegrated into their national competencies' frameworks • **Partnerships with donors and other key actors** have been set up to support MS in implementing these plans, including for curriculum, teachers' training, and infrastructure. • Existing **NRENS have received support** for greater capacity to contribute to progress in digital literacy in the region. • **Progress in digital literacy is monitored in all MS including** disaggregated data for gender, age, setting (urban/rural) and socio-economic profile	• **Massive digital literacy programs have been implemented in all MS** • **Curriculum revisions** have been updated to fully address national digital literacy needs for the education of ICTs in schools, communities and workplaces • A **common regional digital skills and competencies framework is in place.** • Schools and students are better **equipped to use digital tools and devices** for teaching and learning, connectivity and IT infrastructure in schools are improved.	• Digital Skills: SADC population is Digitally Skilled. Targets by 2030 include that: • 50% of formal labour force has basic digital skills; • 80% of youth have basic digital skills; • 90% of public sector employees have basic digital skills; • 50% of youth have advanced digital skills;

Strategic intervention 6: Strengthen linkages, synergies, and closing gender gap in digital innovation entrepreneurship and research ecosystems			
ACTIONS	**OUTPUT**	**OUTCOME**	**IMPACT:**
• Support regional **academia-industry and field-focused regional events** with a focus on digital innovation, emerging technologies and 4IR • Support to **universities in the region to foster linkages with the private sector** in the areas of digital innovation, emerging tech and 4IR • Set-up of a **network of Centres of Excellence** related to digital innovation, emerging technologies and 4IR • Support and increase **human capital development on digital innovation, emerging tech and 4IR by increasing mobility initiatives** across the region for students • Monitor digital innovation, research and digital entrepreneurship (Observatory)	• **Academia-industry collaboration agreements** emerging technologies on digital innovation and 4IR are signed and implemented, envisaging namely the organisation of regional events. • A **regional network of Centres of Excellence (CoE)** is supporting **regional researchers' collaboration** on digital innovation, emerging technologies and 4IR. promoting the integration and cohesion of the regional research landscape. • **Mobility initiatives** are implemented **across** the region for students, researchers and professionals in digital research areas	• SADC Centres of Excellence **related to digital innovation, emerging technologies and 4IR** do research contributing to implementing the SADC Industrialisation Strategy values chains and the RISDIP. • There is a better alignment between the academic degrees and the regional market /industry demand in terms of skills, qualifications and research for innovation.	• Significant increase in **digital innovation in SADC**. • **Emergence of a strong 4IR sector** support by qualified skills and research.
• Establish a **regional support programme to close the gender gap** in digital skills, emerging tech and 4IR, and to encourage women-led digital entrepreneurship • Set-up of a **mechanism within the Regional Development Fund (RDF) for closing the gender gap** in digital innovation, emerging technologies, 4IR and digital entrepreneurship • Support MS in providing **sex-disaggregated data** on digital skills, emerging technologies and 4IR (Observatory)	• SADC has supported the MS in developing **programmes to close the gender gap** in digital innovation, emerging tech and 4IR, and to encourage women-led digital entrepreneurship. • Funding from the RDF is used by MS to put in place initiatives that address the gender gap in digital innovation, emerging technologies and 4IR. • Through the regional observatory**, the gender gap in digital innovation across SADC is monitored** and continuously addressed.	• Specific plans and programmes are funded and implemented to close the **gender gap** in digital skills, emerging tech and 4IR, and to encourage women-led digital entrepreneurship in SADC MS	• Gender balance is achieved in digital skills, emerging tech and 4IR, and women-led digital entrepreneurship is encouraged.

DTS Strategic intervention 7: Promote funding, open access and dissemination in research for digital innovation			
ACTIONS	**OUTPUT**	**OUTCOME**	**IMPACT:**
• Support MS **to increase domestic and external funding in digital innovation**, emerging technologies and 4IR • Support and strengthening of **existing NRENs** and establishment of **new ones** • Develop a **Regional Open Access Framework** to support MS and universities in acquiring licenses to access the main global research journals and platforms • **Support to the implementation of the Regional Open Distance Learning (ODL) Strategic Plan 2022-2030** for universities in the region to build new or improve their physical and virtual infrastructure and resources relevant for dissemination purposes	• MS agencies have developed plans and means to **mobilise new sources of funding for research and digital innovation**, emerging technologies and 4IR • Existing **NRENS have a greater capacity** to ensure research integrity across the region. • **New NRENs are set-up** in the countries where they did not exist. Universities in MS **implement the Regional Open Access Framework** and acquire licenses to access the main global research journals and platforms. **Regional Open Distance Learning (ODL) Strategic Plan 2022-2030** is implemented.	• The majority of the SADC MS universities and research centres in the region have built new or **improved their infrastructure and have more resources**, generating a positive impact on research development. **NRENs and universities** from the region work collaboratively to move forward with **research integration** in the fields of digital innovation, emerging technologies and 4IR.	• The quality and quantity of research in the field of digital **innovation**, emerging technologies and 4IR is significantly improved.

5 SADC High-level implementation action plan (2023-2030)

The following matrix indicates the timeline estimated to implement the actions included in the response strategies described in the previous sections. Many actions have still to be studied and designed more in detail and the timeline for their implementation may vary.

SADC DTS High-level implementation roadmap (2023-2030)

Actions	2023	2024	2025	2026	2027	2028	2029	2030
Strategic intervention 1: Universal affordable access and inclusive adoption, supported by robust resilient and secure infrastructure								
Mandate an implementing agency and design a regional support program for enhancing MS national capacity to improve the design and implementation of connectivity policies, broadband plans, design and enforce the enabling regulations etc.								
Design **model policies, provide TA to countries, trainings, capacity development, peer support, regional networking** and good practices exchange for MS connectivity policies, broadband plans, regulations etc. -								
Design a ***regional interconnectivity promotion program*** (to incentivise and attract private sector investment in cross border and regional inf.) – program implementation targets, special regulations, financial facilities, and other incentives/activities TBD								
Feasibility study and action plan design for SADC regional connectivity plan by SADC MS and interconnection of IXPs CDN data infrastructures (determine if PPP, or purely public, resources used, Special Purpose/Project Vehicles or other models of implementation modalities etc)								
I**mplementation** of the regional connectivity programs and interconnection of IXPs and data infrastructures (previous action/study will identify details)								
Study and design of a regional program to **ensure the availability** of **affordable access devices** (study will determine if centred on reduction if the cost of import, of manufacturing/assembling devices in the region)								
Implementing the affordable access devices program (details TBD by study)								
Monitor SADC ICT infrastructure, coverage, adoption and digital inclusion (**regional ICT/DT observatory**)								

	2023		2024		2025		2026		2027		2028		2029		2030	
Strategic intervention 2: Updated and regionally harmonised legal and regulatory frameworks to enable full digitalisation																
Prepare model laws and digital regulations for SADC MS to adopt (data protection, data governance, privacy, cybersecurity, e-transactions, platform regulation, consumer protection, digital freedom, legal instruments prohibiting harmful actions)																
TA, training and support to MS for the domestication and implementation of the model cyber laws, regulations and national data governance frameworks																
Implement a **platform** for **regional cooperation**, peer **learning, support and dissemination** of good regulatory practices among SADC MS officials (all areas including cybersecurity)																
Develop a **regional SADC cybersecurity strategic plan** (collaborative regional actions) that will include implementation details of the actions below:																
• **Actions and TA to incentivise all MS to ratify** multilateral regulatory agreements such as Malabo and Budapest conventions (awareness events, workshops, TA and support to draft etc)																
• **TA** capacity-building for building Computer national incident response teams (CIRTs) or (CERTs) in SADC MS and securing their cyber domains																
• Set up and manage the regional **cybersecurity governance and coordination mechanisms** within SADC MS																
• Implement the **Regional SADC CIRT** (implementation modalities TDB in strategy)																
• Implement a **Regional legal interoperability** mechanism																

	2023	2024	2025	2026	2027	2028	2029	2030
Strategic intervention 3: Developing capacities and improving readiness for digital adoption across all sectors								
Develop a digital policy and strategy planning toolkit adapted to the SADC context, for updating National Digital Agendas and mainstreaming digital into sectorial policies (including, health, agriculture, education, culture, tourism, etc)								
provide technical assistance and training to MS to **build national Digital agendas and Sectorial Digital Strategies/Plans** (in areas such as health, agriculture, education, culture, tourism, digital / data-driven economy and 4th IR)								
Implement a **platform** for **regional cooperation** on **digital transformation, including** peer **learning, support and dissemination** of good sector digital practices among SADC MS officials (all areas including health, agriculture, education, culture, tourism, and economy)								
Develop a shared regional advanced digital competency and certification framework (data science, AI, software, sys engineers, etc)								
TA and capacity building to **support MS to adopt and implement** the regional **harmonised regional advance competency** and certification framework								
Support SADC MS to design national **Demand and Supply Gap strategies in Advanced Digital Skills**								
Develop and make available to MS regional harmonised training programs for **Digital Technology Entrepreneurship and Innovation** (with Public and Private Partnerships)								
Monitor SADC regional trends on Sectorial Digital maturity and adoption within the Member States sectors (inclusion of all aspects) (observatory function)								

	2023	2024	2025	2026	2027	2028	2029	2030
Strategic intervention 4: E/Digital-Government as a driver of government efficiency and the digitalisation of the economy								
Definition of a **strategic framework for improving E-Gov and Digital Government (EDG)** in the SADC region (set of models for national e/dig-gov policy, laws regulation, implementation guidelines, collaborative regional EDG actions)								
Creation of an **EDG Regional Agency** (regional data centre, support, improve cooperation between e-gov national agencies, training, relevant regional digital services)								
SADC to support the MS in its EDG **capacity-building efforts through the set-up of Public-Private Sector Partnerships (PPP)**								
Provide **training and support** to MS for the domestication and implementation of E/DG nationally								
Support/host or provide special services and digital infrastructures to **implement MS national EDG services** for MS that need it (PKI, etc)								
Support the development of regional data exchange and the **interoperability of SADC MS EDG services** and systems at regional level (including transports, customs, security agencies, regional IDs checks, etc)								
Regularly collect standard **data and meta-data on EDG in MS gov** services and disseminate (observatory function)								

	2023		2024		2025		2026		2027		2028		2029		2030	
Strategic intervention 5: Digital skills for all SADC citizens																
Support to the MS in developing **policies and action plans on digital literacy** (basic to medium skills), covering the private labour force, public sector employees and NEET (not in employment, education or training) youth																
Establishment of the **SADC Digital Competencies / Skills Framework** to support MS in updating their national curricula on digital skills and increasing funding for digital literacy initiatives																
Technical advisory on updating the national curricula to better address the digital avenues																
In collaboration with the MS, **promote regional-wide training programmes** to train highly specialised digital professionals in the public sector and SADC entities.																
Leverage the collaboration with National Research and Education Networks (NRENS) and the UbuntuNet Alliance **to foster digital literacy** at all education levels and develop political models for establishing regional connectivity.																
Increase domestic and external funding for initiatives on improving digital skills, building on the identification of best practices from other relevant projects across Africa																
Support MS in **monitoring digital literacy progress** in the region (observatory function)																

	2023		2024		2025		2026		2027		2028		2029		2030	
DTS Strategic intervention 6: Promote funding, open access and dissemination in research for digital innovation																
Support MS to increase domestic and external funding in digital innovation, emerging technologies and 4IR																
Support and strengthening of **existing NRENs** and establishment of **new ones**																
Develop a **Regional Open Access Framework** to support MS and universities in acquiring licenses to access the main global research journals and platforms																
Support to the implementation of the Regional Open Distance Learning (ODL) Strategic Plan 2022-2030 for universities in the region to build new or improve their physical and virtual infrastructure and resources relevant for dissemination purposes																
Monitor open access and research impact on digital innovation (observatory function)																

	2023		2024		2025		2026		2027		2028		2029		2030	
Strategic intervention 7: Strengthen linkages, synergies, and closing gender gap in digital innovation entrepreneurship and research ecosystems																
Support regional **academia-industry and field-focused regional events** with a focus on digital innovation, emerging technologies and 4IR																
Support to **universities in the region to foster linkages with the private sector** in the areas of digital innovation, emerging tech and 4IR																
Set-up of a **network of Centres of Excellence related to digital innovation, emerging technologies and 4IR**																
Support and increase **human capital development on digital innovation, emerging tech and 4IR by increasing mobility initiatives** across the region for students																
Establish a **regional support programme to close the gender gap** in digital skills, emerging tech and 4IR, and to encourage women-led digital entrepreneurship																
Set-up of a **mechanism within the Regional Development Fund (RDF) for closing the gender gap** in digital innovation, emerging technologies, 4IR and digital entrepreneurship																
Support MS in providing **sex-disaggregated data** on digital skills, emerging technologies and 4IR (observatory function)																

6 Implementation of DTS

6.1 Institutional arrangements, governance and coordination

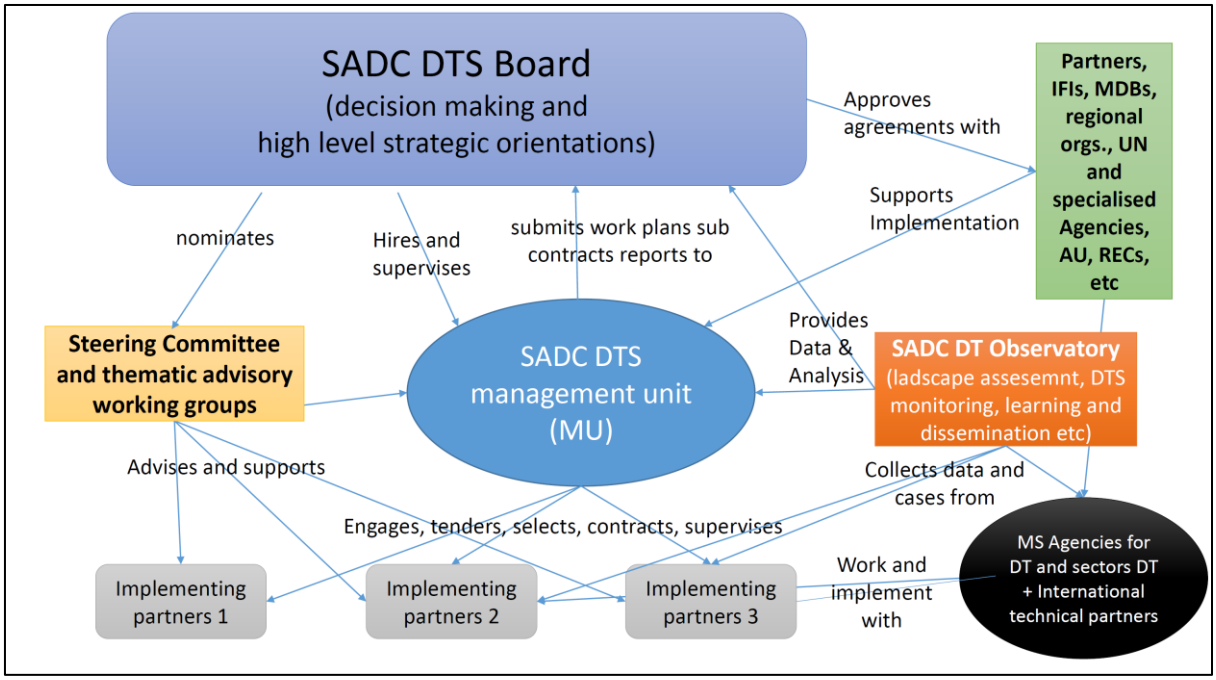

Figure 15: DTS Implementations arrangements: governance and organisation

The DTS implementation will be coordinated by a **management unit (MU) to be setup at the SADC Secretariat (SADC DTS-MU).**

The overall DTS decision-making and governance will rely on the **SADC DTS board** designated by the SADC council of ministers.

Implementing partners will be secreted and contracted to develop the key interventions, in coordination with **Member States' agencies, regional bodies** and technical partners.

A steering committee with specialised thematic working groups will support the MU and the implementation partners.

The SADC DT observatory could be implemented by a partner organisation or in-house at the SADC secretariat.

More specifically:

- The SADC DTS MU will
  - Be staffed with at least 5 thematic specialists (connectivity policies and infrastructures, digital regulations and cybersecurity, digital economy and 4th IR, public services/sectors and value chains digitalisation, skills, digital research and innovation), a DTS MU coordinator and support staff (admin, communications, etc)
  - Prepare annual work plans, technical and financial reports
  - Report to the DTS board and act as its secretariat
  - Facilitate the DTS board, the steering committee and the working groups meetings

- Engage and communicate with all partners, MS agencies, national and regional stakeholders
- Develop requests for services and tender specifications, select implementing partners and agencies, issue contracts and ensure follow-up procedures, for the implementation of all the DTS components
- Prepare project proposals and the documents necessary to submit for funding to cooperation partners (EU, and others), Development Financial Institutions (DFIs), multilateral development banks (MDBs such as World Bank, African Development Bank, European investment bank, AFD, UNDP…)
- Including the SADC DT observatory (functions described in the previous section above)

- **The SADC DTS Board** is to be designated by the SADC council of ministers and it will:
  - Be the overarching decision-making body for the DTS implementation.
  - Be constituted of key SADC Secretariat Directors, SADC agencies' representatives and SADC MS' representatives delegated by the MS of the SADC Council of Ministers
  - Approve annual MU work plans, reports, budgets, cooperation and partnerships agreements, procurement processes and contracts with implementing partners.
  - Meet at least three times a year (or more often, as needed).
  - Hire staff, designate the coordinator and supervise the SADC DTS-MU operations.
- The SADC DTS steering committee will:
  - Provide advice and orientations to the DTS MU and the board
  - Ensure awareness of and the purpose of liaison mechanisms with all the regional, sub-regional and international cooperation programs and partnerships existing in the areas related to DTS
  - Include several thematic sub-committees that will provide input and support in specific areas of the DTS implementation (connectivity policies and infrastructures, digital regulations and cybersecurity, digital economy and 4th IR, public services/sectors and value chains digitalisation, skills, digital research and innovation)
  - Be constituted by the MS agencies, with representatives being nominated and delegated by their MS in the different thematic committees, selected international and regional agencies and partners, private sector and civil society stakeholders.
- Implementing partners will
  - Be selected and contracted by the SADC Secretariat to implement the DTS, with approval from the Board and under the day-to-day supervision of the SADC DTS MU.
  - Work with regional agencies, international bodies and national MS institutions
  - Have their own work plan, reporting mechanisms,
  - Manage the DTS implementation for all the seven strategic intervention areas and the SADC DT Observatory:

6.2 DTS Costing

6.2.1 General estimated costs of the DTS and scenarios

The budgeting exercise results in an estimated **budget for the first two years of DTS, of 45 million euro**. That includes several feasibly studies and planning exercises that will determine further budgets for key projects to be implemented in the following five years (2025-2030).

These are nonetheless estimated, using a scenario, a low estimate one and one high estimate. The total result for the cost of the 5 years 2025-2030 implementation is 94 million euro for the low scenario and 310 million euro for the high scenario.

For the whole period of the seven years of DTS (2023-2030), the **estimated total cost is between 139 and 354.7 million euros.** The table below summarises the overall DTS costing, then is followed by a costing detailed per strategic intervention.

DTS BUDGET summary (Millions EUR)	Estimated budget for 2023-2025	Budget range 2025-2030	
		Low	high
Strategic intervention 1: Universal affordable access and inclusive adoption, supported by robust resilient and secure infrastructure	1.4	25.5	151.5
Strategic intervention 2: Updated and regionally harmonised legal and regulatory frameworks to enable full digitalisation	1.7	2.3	5.4
Strategic intervention 3: Developing capacities and improving readiness for digital adoption across all sectors	2.3	1.5	3
Strategic intervention 4: E/Digital-Government as a driver of government efficiency and the digitalisation of the economy	2.1	5.2	12.5
Strategic intervention 5: Digital skills for all SADC citizens	3.6	2	4.5
DTS Strategic intervention 6: Promote funding, open access and dissemination in research for digital innovation	26.6	52	122
DTS Strategic intervention 7: Promote funding, open access and dissemination in research for digital innovation	5.3	0.5	0.8
DTS Management Unit DTS coordination & governance (staff, operational costs, travels)	1	3	6
SADC DTS OBSERVATORY (for 7 components)	1	2	4
TOTAL	**45**	**94**	**309.7**

6.2.2 Estimated costs for each strategic intervention

Strategic intervention 1: Universal affordable access and inclusive adoption, supported by robust resilient and secure infrastructure	Costed items	Estimated cost 2023-2025	Cost range 2025-2030 Low	high
Design regional support program and mandate agency for enhancing MS national capacity to improve the design and implementation of connectivity policies, broadband plans, design and enforce the enabling regulations etc.	Experts, consultations planning	0.2		
Design **model policies, provide TA to countries, trainings, capacity development, peer support, regional networking** and good practices exchange for MS connectivity policies, broadband plans, regulations etc. -	Research, drafting Training, TA, workshops	0.3	0.5	1.5
Design a ***regional interconnectivity promotion program*** (to incentivise and attract private sector investment in cross border and regional inf.) – program implementation targets, special regulations, financial facilities, and other incentives/activities TBD	Experts, workshops TA	0.2		
Feasibility study and action plan design for SADC regional connectivity plan by SADC MS and interconnection of IXPs CDN data infrastructures (determine if PPP, or purely public, resources used, Special Purpose/Project Vehicles or other models of implementation modalities etc)	Experts, feasibility study	0.3		
I**mplementation** of the regional connectivity programs and interconnection of IXPs and data infrastructures (previous action/study will identify details) *(implementation may include private sector investments)*	Infrastructures and their management		20	100
Study and design of a regional program to **ensure the availability** of **affordable access devices** (study will determine if centred on reduction if the cost of import, of manufacturing/assembling devices in the region)	Experts, feasibility study	0.4		
Implementing the affordable access devices program (details TBD by study) *(implementation may include private sector investments)*	Device assembly or manufacturing plant (PPP?)		5	50
Total strategic intervention 1		1.4	25.5	151.5

Strategic intervention 2: Updated and regionally harmonised legal and regulatory frameworks to enable full digitalisation	**Costed items**	**Estimated cost 2023-2025**	**Cost range 2025-2030**	
			Low	**high**
Prepare model laws and digital regulations for SADC MS to adopt (data protection, data governance, privacy, cybersecurity, e-transactions, platform regulation, consumer protection, digital freedom, legal instruments prohibiting harmful actions)	Experts, Stakeholders consultations drafting	0.5	0.2	0.4
TA, training and support to MS for the domestication and implementation of the model cyber laws, regulations and national data governance frameworks	Training, TA, workshops	0.5	0.5	1
Implement a **platform** for **regional cooperation**, peer **learning, support and dissemination** of good regulatory practices among SADC MS officials (all areas including cybersecurity)	Networking platform facilitation workshops	0.2	0.4	0.6
Develop a **regional SADC cybersecurity strategic plan** (collaborative regional actions) that will include implementation details of the actions below:	Experts, workshops drafting	0.2		
• **Actions and TA to incentivise all MS to ratify** multilateral regulatory agreements such as Malabo and Budapest conventions (awareness events, workshops, TA and support to draft etc)	Events, workshops	0.3		
• **TA** capacity-building for building Computer national incident response teams (CIRTs) or (CERTs) in SADC MS and securing their cyber domains	Trainings Capacity building		0.3	0.5
• Set up and manage the regional **cybersecurity governance and coordination mechanisms** within SADC MS	Excerpts coordination workshops		0.3	0.5
• Implement the **Regional SADC CIRT** (implementation modalities TDB in strategy)	equipment experts + TA		0.4	2
• Implement a **Regional legal interoperability** mechanism	Experts, workshops		0.2	0.4
Total strategic intervention 2		**1.7**	**2.3**	**5.4**

Strategic intervention 3: Developing capacities and improving readiness for digital adoption across all sectors	**Costed items**	**Estimated cost 2023-2025**	**Cost range 2025-2030**	
			Low	**high**
Develop a digital policy and strategy planning toolkit adapted to the SADC context, for updating National Digital Agendas and mainstreaming digital into sectorial policies (including, health, agriculture, education, culture, tourism, etc)	Experts, researchers Stakeholders' consultations	0.3		
Provide technical assistance and training to MS to **build national Digital agendas and Sectorial Digital Strategy/Plans** (in areas such as health, agriculture, education, culture, tourism, digital / data-driven economy and 4th IR)	Experts, Training, drafting Other TA	0.5	0.8	1.5
Implement a **platform** for **regional cooperation** on **digital transformation, including** peer **learning, support and dissemination** of good sector digital practices among SADC MS officials (all areas including health, agriculture, education, culture, tourism, and economy)	Networking platform facilitation studies workshops	0.2	0.2	0.5
Develop a shared regional advanced digital competency and certification framework (data science, AI, software, sys engineers, etc)	Experts, research studies workshops	0.5		
TA and capacity building to **support MS to adopt and implement** the regional **harmonised regional advance competency** and certification framework	Experts, Training, drafting TA		0.5	1
Support SADC MS to design national **Demand and Supply Gap strategies in Advanced Digital Skills**	Experts, research drafting	0.3		
Develop and make available to MS regional harmonised training programs for **Digital Technology Entrepreneurship and Innovation** (with Public and Private Partnerships)	Experts, research TA	0.5		
Total strategic intervention 3		**2.3**	**1.5**	**3**

Strategic intervention 4: E/Digital-Government as a driver of government efficiency and the digitalisation of the economy	**Costed items**	**Estimated cost 2023-2025**	**Cost range 2025-2030**	
			Low	**high**
Definition of a **strategic framework for improving E-Gov and Digital Government (EDG)** in the SADC region (set of models for national e/dig-gov policy, laws regulation, implementation guidelines, collaborative regional EDG actions)	Experts, researchers consultations	0.3		
Creation of an **EDG Regional Agency** (regional data centre, support, improve cooperation between e-gov national agencies, training, relevant regional digital services)	Intuitional set up, staff Equipment operations	1	2.5	5
SADC to support the MS in its EDG **capacity-building efforts through the set-up of Public-Private Sector Partnerships (PPP)**	facilitation workshops TA	0.3	0.2	0.5
Provide **training and support** to MS for the domestication and implementation of E/DG nationally	Experts, Training, drafting TA	0.5	0.5	1
Support/host or provide special services and digital infrastructures to **implement MS national EDG services** for MS that need it (PKI, etc)	Experts, Equipment operations		1	3
Support the development of regional data exchange and the **interoperability of SADC MS EDG services** and systems at regional level (including transports, customs, security agencies, regional IDs checks, etc)	Experts, Equipment Operational costs		1	3
Total strategic intervention 4		**2.1**	**5.2**	**12.5**

Strategic intervention 5: Digital skills for all SADC citizens	Costed items	Estimated cost 2023-2025	Cost range 2025-2030	
			Low	high
Support to the MS in developing **policies and action plans on digital literacy** (basic to medium skills), covering the private labour force, public sector employees and NEET (not in employment, education or training) youth	Experts, workshops Drafting & TA	0.8	0.5	1
Establishment of the **SADC Digital Competencies / Skills Framework** to support MS in updating their national curricula on digital skills and increasing funding for digital literacy initiatives	Experts, workshops facilitation	1		
Technical advisory on updating the national curricula to better address the digital avenues	Experts, Training, TA	0.5		
In collaboration with the MS, **promote regional-wide training programmes** to train highly specialised digital professionals in the public sector and SADC entities.	Experts, Training, drafting TA	0.5	1	3
Leverage the collaboration with National Research and Education Networks (NRENS) and the UbuntuNet Alliance **to foster digital literacy** at all education levels and develop political models for establishing regional connectivity.	Experts, Equipment operations	0.3	0.2	0.5
Increase domestic and external funding for initiatives on improving digital skills, building on the identification of best practices from other relevant projects across Africa	Experts drafting support	0.5	0.3	0,5
Total strategic intervention 5		**3.6**	**2**	**4.5**

DTS Strategic intervention 6: Promote funding, open access and dissemination in research for digital innovation	Costed items	Estimated cost 2023-2025	Cost range 2025-2030 Low	high
Support MS to increase domestic and external funding in digital innovation, emerging technologies and 4IR	Experts	0.3		
Support and strengthening of **existing NRENs** and establishment of **new ones**	NREN set up & connectivity	16	32	64
Develop a **Regional Open Access Framework** to support MS and universities in acquiring licenses to access the main global research journals and platforms	Experts, workshops TA	0.3		
Support to the implementation of the Regional Open Distance Learning (ODL) Strategic Plan 2022-2030 for universities in the region to build new or improve their physical and virtual infrastructure and resources relevant for dissemination purposes (*ref budget from SADC Regional Open and Distance Learning Strategic Plan 2022-2030)*	Experts, Training, equipment connectivity Operational costs	10	20	58
Total strategic intervention 6		26.6	52	122

DTS Strategic intervention 7: Promote funding, open access and dissemination in research for digital innovation	Costed items	Estimated cost 2023-2025	Cost range 2025-2030	
			Low	high
Support regional **academia-industry and field-focused regional events** with a focus on digital innovation, emerging technologies and 4IR	Experts, workshops events	0.8		
Support to **universities in the region to foster linkages with the private sector** in the areas of digital innovation, emerging tech and 4IR	Experts, workshops	0.5		
Set-up of a **network of Centres of Excellence related to digital innovation, emerging technologies and 4IR**	Networking facilitations workshops	1		
Support and increase **human capital development on digital innovation, emerging tech and 4IR by increasing mobility initiatives** across the region for students.	scholarships	1.5		
Establish a **regional support programme to close the gender gap** in digital skills, emerging tech and 4IR, and to encourage women-led digital entrepreneurship	Experts, drafting workshops TA	1		
Set-up of a **mechanism within the Regional Development Fund (RDF) for closing the gender gap** in digital innovation, emerging technologies, 4IR and digital entrepreneurship	Experts, drafting Workshop with MS	0.5	0.5	0.8
Total strategic intervention 7		**5.3**	**0.5**	**0.8**

6.3 SADC DTS Monitoring and evaluation framework

For each strategic intervention is proposed below at least one indicator for each output, each outcome and each impact. Action implementation will be monitored by simple budgetary execution (done / not done).

As much as possible, the indicators proposed are measurable, have one or several clear targets, are linked to a date and their source is identified. Nonetheless, some still need to be determined.

Indicators for strategic intervention 1: Universal affordable access and inclusive adoption, supported by robust resilient and secure infrastructure

OUTPUT monitoring indicators		
Output	**Indicator, target, and date**	**Source of verification**
• Are designed SADC **model policies, design playbooks, and model regulatory tools for affordable broadband** and digital inclusion	• A set of SADC model policies, policy design/domestication playbooks, and a set of model regulatory tools for affordable broadband and digital inclusion are approved and available for MS to domesticate in 2025	DTS implementation unit reports being prepared by the SADC DTS implementation unit with the support of specific component implementing partner
• MS have better **capacity and access to TA for national broadband plans design and implementation** of new regulatory frameworks	• all MS who requested or applied have received training, guidance or support for staff related to connectivity policies design and implementation • Institutional capacity indicators improved for the SADC MS agencies in charge of connectivity/broadband agencies by 2026	DTS implementation unit reports Institutional Capacity assessments (ex/ante) of MS agencies in charge of the connectivity/broadband policy/plans/regulations
• Regional and MS **progress is monitored and benchmarked**, and impact studied	• Regular (twice a year 2023-2026) status of connectivity and digital inclusion reports are produced and validated by SADC MS and DTS steering committee	**Semesterly DTS Observatory activity reports**
• Regional **collaborative connectivity projects are designed**	• Two collaborative connectivity projects are designed in 2023) and two more (2026)	DTS **implementation reports** being prepared by the SADC DTS implementation unit with the support of specific component implementing partner
• **Policy** and regulatory **targeted incentives to attract private sector** investments are designed at national and regional level	• By end of 2024, Each MS has received recommendations for creating **incentives to attract private sector investment in digital infrastructures and services** investments. These are harmonised at regional to promote and maximise the possibility of private sector regional investments.	DTS **implementation reports** being prepared by the SADC DTS implementation unit with the support of specific component implementing partner
• **Regional** backbone **interconnectivity promotion and incentives program** is implemented	• Regional SADC **interconnectivity plan is prepared by end of 2024** including the recommended policy and regulatory measures to be taken by each MS to enable and maximise **private sector investment**	DTS **implementation reports** are being prepared by the SADC DTS implementation unit with the support of

		specific component-implementing partner
• Regional **network of interconnected IXPs with** CDNs/Data centres is in place	• Regional network **of interconnected IXPs design, modality and budget is approved (2023) and implemented by 2027**	DTS **implementation reports** are to be prepared by the SADC DTS implementation unit with the support of specific component implementing partner
• Implemented a **regional program of affordable access devices** (smartphone assembling or production)	• The plan for affordable access devices is approved in 2023, funds mobilised in 2024, and implementation starts in 2025. The target for the availability of devices to SADC citizens would be by end of 2026	DTS **implementation reports** are being prepared by the SADC DTS implementation unit with the support of specific component-implementing partner

OUTCOME evaluation indicators		
OUTCOME	**Indicator, target, and date**	**Source verification**
• MS develop and **implemented effectively their national connectivity and rural broadband** policies plans or strategies resulting in network expansion, **more competition, better and affordable services**	• Above average Improvement of SADC scores on the Connectivity Policies ADI index (A4AI) by 2026 • Improvement of category on the ITU regulatory tracker (for regulation capacities) for al MS by 2026 • Improvement of 10% of scores of MS in HHI market competition index	CRASA report ITU/ATU reports A4AI policy index reports (ADI **ITU regulatory tracker**
• Regional **backbones interconnected, resilient, redundant**, offering cheaper wholesale capacity	• 50 % reduction of wholesale prices by 2026, 100% by 2029	CRASA reports ITU data.
• **Affordable services and devices** are available to all SADC citizens	• All countries reach UN affordability thresholds by 2026 for broadband and devices • And the same for all SDC MS income quintiles by 2028	**A4AI/ITU affordability data/ index and quintile data.**

IMPACT evaluation indicators		
IMPACT	**Indicator, target, and date**	**Source verification**
• **Universal broadband coverage** of SADC's population and territory	by 2030: • 95% of the population is covered or in reach of affordable[51] broadband[52] connectivity; • 90% of the urban population is within 25km of a fibre node. • 90% of the SADC countries' heads of municipalities are connected **to a broadband backbone.**	ITU/CRASA/DTS implementation unit reports

[51] affordability indicator and its threshold defined as per ITU/ UN broadband commission (currently as of 20022 2% of NGI per data of 2Gb data package available for 20 days), for at least all of the population (calculated by 5 income quintiles). UN 2030 target are: entry-level broadband subscription costs less than 2% of GNI capita and entry-level broadband subscription costs less than 2% of average income of the bottom 40% of population

[52] broadband speeds as per UN BB and ITU definition >10Mpbs download, with any technology: wireless, fixed, satellite). UN 2030 target mentions covered by a mobile network of the latest technology, that is the one with at least 40% of the population already covered

	• 90% of SADC the population older than 15 years old has access to affordable (or free) broadband connectivity[53];	
• **Universal Access and broadband adoption** are achieved among the SADC population.	By 20203 • 80% of SADC the population older than 15 years, is connected, using affordable broadband connectivity; • 50% of households have a dedicated broadband Internet access • 100% of formal Businesses use the Internet; • Gender gaps in internet use, mobile phone ownership and digital skills are closed (parity achieved) • 50% of the population enjoys Affordable and Meaningful Connectivity54	ITU/CRASA/DTS implementation unit reports
• Gender gaps closed	• Gaps in Internet use, mobile phone ownership and digital skills are closed (parity achieved 50/50)	ITU/CRASA/DTS implementation unit reports
All key Public services **institutions are interconnected**	by 2030 • all secondary schools have broadband connectivity (using UN targets standards for quality55) and it is available for students and teachers • all health centres are properly connected to a national health network and national health systems • all post offices are connected to their national network • all police stations and customs offices are properly connected to national networks and information systems	SAD MS data processed by ITU/CRASA/DTS implementation unit

[53] includes its own device or public access, open WIFI, community centres, schools, post offices, or in the workplace

[54] The current meaningful connectivity target sets minimum thresholds across the four dimensions of internet access that matter most to users. Regular internet use | minimum threshold: daily use An appropriate device | minimum threshold: access to a smartphone Enough data | minimum threshold: an unlimited broadband connection at home or a place of work or study A fast connection | minimum threshold: 4G mobile connectivity. See https://a4ai.org/meaningful-connectivity/

[55] UN 20230 targets set : minimum download speed at every school = 20 Mb/s, minimum download speed available per student = 50 kb/s and minimum data allowance for every school 200 GB

Indicators for strategic intervention 2: Updated and regionally harmonised legal and regulatory frameworks to enable full digitalisation

OUTPUT monitoring indicators		
Output	**Indicator, target, and date**	**Source of verification**
• Regional **model policy, laws, regulation, and implementation guidelines** on digital government available for domestication by MS	• By mid-2024, are available of the drat model policy, laws, regulations, and implementation guidelines related to digital domestication by MS	DTS implementation unit reports
• **Capacities for digital regulation design and enforceme**nt implementation are developed in SADC MS	• By 2028, all MS who requested or applied to have received staff training, guidance or support to develop their organisations to enable enforcement of digital legal and regulatory tools	DTS implementation unit reports
• **Regional cybersecurity plan and collaboration mechanism** are approved activities identified and planned	• By mid-2024 a plan has been developed to integrate and frame regional collaboration on cybersecurity	DTS implementation unit reports
• MS are **actively collaborating on national implementation**, on **the Regional SADC CIRT** and a **regional legal interoperability mechanism on digital**	• the regional cybersecurity governance and coordination mechanisms established by 2025 • 4 annual regular high-level meetings are held with all the MS related agencies patriating in the plan • Regional SADC CIRT operating by 2026 • regional legal interoperability mechanism on digital in place by 2026	DTS implementation unit reports

OUTCOME evaluation indicators		
OUTCOME	**Indicator, target, and date**	**Source verification**
• All **SADC MS have comprehensive sound National data privacy, Data protection, Data governance Cybersecurity, e-Transactions, and consumer protection laws**	• By 2028 all frameworks approved in all MS.	DTS implementation unit reports
• All MS have ratified and domesticated **the AU Convention on Cybersecurity and Personal** Data Protection (Malabo Convention) and the Budapest Convention	• By 2025 All MS have ratified both contentions • By 2026 All MS have put in place enforcement mechanisms.	DTS implementation unit reports
• Governance and coordination mechanisms within SADC MS are set and effective on **regional digital regulatory frameworks harmonisation**	• By 2030 All MS have put in place enforcement mechanisms for all the data/digital governance and regulations • Increase by 1 point each year 2022-2025 in scorecard of ITU ICT regulatory frameworks[56](Regulatory authority, Regulatory mandate,	DTS implementation unit reports, ITU

[56] https://app.gen5.digital/tracker/metrics

	Regulatory regime, Competition framework for the ICT sector)	
• Regional SADC national and regional **Cybersecurity response coordination capacity** strengthened	• By 2028 All MS have put in place cybersecurity KPIs like: ○ Level of Preparedness ○ Unidentified Devices on Internal Networks ○ Intrusion Attempts ○ Security Incidents ○ Mean Time to Detect (MTTD) ○ Mean Time to Resolve (MTTR) ○ Mean Time to Contain (MTTC) ○ Average Vendor Security Rating	DTS implementation unit reports
• Computer incident response teams (CIRTs) or (CERTs) are coordinated and collaborating in the region	• Regional SADC CIRT operating and collaborating by 2030 and launch a common target with 3 operational Computer incident response teams (CIRTs) or (CERTs), and launch a common target for: ○ Preparation ○ Detection and analysis ○ Containment, eradication, and recovery ○ Post-incident activity	DTS implementation unit reports

IMPACT evaluation indicators		
IMPACT	**Indicator, target, and date**	**Source verification**
• SADC MS digital **regulatory frameworks** and effective enforcement, the **i**mproved cybersecurity, **create online trust and safety, enable digital innovation and incentivise investment in digital economy**	• By 2030 a100% Improvement SADC MS Cybersecurity Index (GCI) [57] and National Cybersecurity Index [58] • By 2026 50% improvement in data/digital regulation and governance indexes • 100% by 2030	DTS implementation unit reports
• The enabling environment for **regional single digital market** is built	• Regional single digital market statistics and indicators like: • % of SADC SMEs should trade online across more than one border • % of internet users should order goods or services across SADC borders • Number of contributions of MS in horizontal activities	DTS implementation unit reports

[57] https://www.itu.int/epublications/publication/D-STR-GCI.01-2021-HTM-E
[58] https://ncsi.ega.ee/

Indicators for strategic intervention 3: Developing capacities and improving readiness for digital adoption

OUTPUT monitoring indicators		
Output	**Indicator, target, and date**	**Source of verification**
• SADC MS have access to **support, technical assistance, tools, blueprints training, to design and implement National Digital Agendas and Sectorial** digitalisation strategies and plans	• By 2030, all MS have improved their rankings and met the minimum African Target average59 in Digital Preparedness Index60, the indicators measure enablers that facilitate a country's adoption, use and local development of digital technologies. • All SADC countries have Digital e-education, e-Agriculture, e-Health, e-Tourism, e-Financial sectorial strategies and action plans by 2030	DTS implementation unit reports, World Bank, EU, bilateral, UNICEF, GPE, AfDB, UNESCO
• Member States capacities are strengthened for digital policies **design, mainstreaming and implementatio**n in all sectors	• All SADC countries sectorial digital strategies have the staff required for their implementation by 2028	DTS implementation unit reports
• An advanced **regional digital competency and certification framework** is designed and MS are supported to adopt it	• By 2030, all SADC Member States adopt and implement teachers' digital skills competency framework • By 2030, all SADC members adopt and implement a digital competency frameworks and guidelines for students' digital skills • By 2030, an increased number of computer coders (including girls and students with disabilities) by 10% on an annual basis	DTS implementation unit reports, UNESCO
• SADC MS have designed national Demand and Supply Gap strategies **to retain advanced Digital Skills**	• Demand and Supply Gap strategies available for each SAC MS by 2026	DTS implementation unit reports
• SADC MS have designed **Digital Technology Entrepreneurship and Innovation** strategies that enable academia-private-public partnerships in innovation, technology transfer	• All SADC MS have a Digital Technology Entrepreneurship and Innovation strategies approved by 2028	DTS implementation unit reports
• MS are **implementing functional pilot projects** in sectors, such as agriculture (eAgriculture), energy (eEnergy), governance (eGovernance), health (eHealth), climate change (climate services), and Security Operation Centre (SOC) using Big Data, Artificial Intelligence (AI), and Internet of Things (IoT);	• All the MS have developed technical pilots by 2030	DTS implementation unit reports
• A **regional Model Framework to enhance capacities** and skills in emerging and advanced technologies are developed	• By 2028 SADC MS regional competency and certification frameworks model to ensure that digital advanced skills become a core competency of every teacher and	DTS implementation unit reports

[59] Improving higher weight of 0.25 each to the first three dimensions (i.e., education and skills, infrastructural readiness and the business dynamism and environment indicators) to meet at minimum the 0.35 target

[60] https://cseaafrica.org/gism/

	student in the region and that teachers are certified and recognized for their digital trainings. • Annual statistics and percentage of increase in certified teachers, students and workforce, Indexes reflect an increase in advanced skills and talents every year	
• Data**, use cases**, and best practices are available for **monitoring digital adoption progress** and assessing the **scalability** of **digital solutions adapted to the SADC c**ontext across different sectors.	• Functional pilots enabling new digital applications in different sectors Piloting use cases in 2025, • Production use cases in 2030 • A yearly brochure by SADC pointing at the successful sectorial use cases deployed in SADC MS	DTS implementation unit reports

OUTCOME evaluation indicators		
OUTCOME	**Indicator, target, and date**	**Source verification**
• National Digital transformation **agendas adopted and being implemented**	• All member states have developed their national digital Agenda strategies by 2024.	SADC, MS, Observatory function
• in all SADC MS digital is effectively **mainstreamed across all sectors** e-Edu, e-health e Agri etc) with proper **strategies** and capacities	• All member states have developed their national digital Sectorial strategies by 2025.	SADC, MS, Observatory function
• There is sufficient **availability of advanced technical skills certified** and able to work seamlessly **across the region**	• All SADC MS Devices available for 50% of students and 50% of teachers by 2025, Assistive devices available for 50% of students in 2025	DTS implementation unit reports

IMPACT evaluation indicators		
IMPACT	**Indicator, target, and date**	**Source verification**
• Economic growth and digitally driven gains of **productivity and/or efficiency in all sectors** (public services, gov, culture, education, agriculture, industry) driven by data-driven models and digital technologies	• By 2030 10% growth of the SADC GDP is driven by gains in productivity deriving from the digitalisation of the economies	DT Observatory based on macroeconomic data and modelling relevant to SADC economies.
• Growth of the digital economy, **4th IR and digital goods and services** sector	• By 2028 digital sector (ICT industry, services, 4IR businesses) contribution to SADC GDP has doubled from 2023 • Same sector contribution to SADC GDP has Tripled by 2030	

Indicators for strategic intervention 4 - E/Digital-Government as a driver of government efficiency and the digitalisation of the economy

OUTPUT monitoring indicators		
Output	**Indicator, target, and date**	**Source of verification**
• Regional EDG **model policy, laws, regulation**, and implementation **guidelines** on **available for domestication** by MS	• A set of SADC model policies, laws, regulations and guidelines are available to MS until 2025 to guide their national policies on EDG.	Internal verification procedures.
• **National capacities are developed** for EDG implementation in MS.	• The SADC EDG Regional Agency supports MS in the implementation of their EDG policies and regulation.	MS and EDG Regional Agency report to the DTS implementing unit.
• MS institutions and officials **actively collaborate** to support the national implementation of EDG.	• Capacity-building efforts rely partially on the set-up of public-private partnerships, established with the support of SADC.	MS report to the DTS implementing unit.
• A **regional digital infrastructure platform** is put in place to develop, **support and implement MS national EDG services**.	• The platform is completed by 2030.	Performance data from the platform is collected by the DTS implementing unit.
• **Regional** EDG activities **identified and planned** (as interconnecting national EDG services and regional data exchange)	• The EDG Regional Agency supports MS in establishing regional EDG activities, exchanges and peer learning.	The EDG Regional Agency reports to the DTS implementing unit.
• Regional **benchmarking** of SADC MS EDG and **case studies** are published regularly	• The EDG Regional Agency monitors MS activities in EDG, develops benchmarking cases and reports on regional achievements and challenges.	The EDG Regional Agency reports to the DTS implementing unit.

OUTCOME evaluation indicators		
OUTCOME	**Indicator, target, and date**	**Source verification**
• All SADC MS **implement comprehensive and sound EDG policies,** in line with a regional framework, by 2030.	• MS show a regional alignment in their national EDG policies.	The EDG Regional Agency report on the MS progress and their alignment with the regional frameworks.
• Key National MS **EDG services and apps regionally interconnected** / regionally exchanging data using the regional platform	• The process of regional data collection on EDG and the peer-learning experience is supported by all MS.	The EDG Regional Agency reports to the DTS implementation unit on the MS' efforts to exchange and learn from one another on EDG regulations and initiatives.
• R**egional EDG services** and applications **developed** as per plan	• The EDG Regional Agency leads the process of defining and implementing regional EDF services and applications, at the collective request of MS.	The EDG Regional Agency reports to the DTS implementation unit on MS' needs and potential support by the Agency on regional EDG services.

IMPACT evaluation indicators		
IMPACT	**Indicator, target, and date**	**Source verification**

• **Enhanced public efficiency** and **universal access to public services**.	• Key public services show greater efficiency and the general population shows satisfaction with the available digital services.	Based on consultative processes with public sector staff and the general population, MS and the EDG Regional Agency report to the DTS implementing unit.
• Digital government is a **driver in digitalisation for the society** and the SADC economies	• By 2030, the general population shows satisfying levels of skill to access public services through digital means.	Based on consultative processes with public sector staff and the general population, MS and the EDG Regional Agency report to the DTS implementing unit.
• **Regional integration and regional single market are facilitated** by interconnected and interoperable digital services	• The economy and public services relevant to businesses rely on digital services.	Based on consultative processes with the private sector, MS and the EDG Regional Agency report to the DTS implementing unit.

Indicators for strategic intervention 5: Digital skills for all SADC citizens

OUTPUT monitoring indicators		
Output	**Indicator, target, and date**	**Source of verification**
• All SADC MS **have policies on digital literacy** and **plans to increase massively** their population's **digital literacy**	• New plans are finalized by 2030, on all types of digital skills (basic, intermediate and advanced)	DTS implementation unit to implement the creation of a yearly report that describes plans by MS
• All SADC MS have **received support to develop their capacity to implement** these **plans**	• A relevant number of initiatives between all MS has occurred until 2030, leading to the development of capacities to implement these programs	List of support initiatives generated until 2030
• All SADC MS have **received support** (TA and training) **to adopt the common SADC Digital Competencies / Skills Framework i**ntegrated into their national competencies frameworks	• Considerable number of training programmes have been completed until 2030, via the harmonizing of competencies under one common framework	DTS implementation unit to produce a report which discloses which MS have received training
• **Partnerships with donors and other key actors** have been set up to support MS in implementing these plans, including for curriculum, teachers' training, and infrastructure.	• Partnerships should be achieved on three fronts (curriculum, teachers and infrastructure)	DTS implementation unit should make an appendix document where all official partnerships are listed
• Existing **NRENS have received support** for greater capacity to contribute to progress in digital literacy in the region	• Tangible impact of NRENs in the promotion of initiatives to bridge the digital gap	Comparison study made between the previous and current influence
• **Progress in digital literacy is monitored in all MS including** disaggregated data for gender, age, setting (urban/rural) and socio-economic profile	• Indicators should be created to assess this, such as % of the population who possess digital skills, the number of women in school, % of rural population that has access to education, among others	The DTS implementation unit should study the best way of gathering data, with the support of the multiple directorates at SADC

OUTCOME evaluation indicators		
OUTCOME	**Indicator, target, and date**	**Source verification**
• **Massive digital literacy programs have been implemented in all MS**	• % of programs that have been implemented in MS	DTS implementation unit report on a country-per-country basis
• **Curriculum revisions** have been updated to fully address national digital literacy needs for the education of ICTs in schools, communities and workplaces	• Number of curriculum revisions that have been done in MS	DTS implementation unit report on curriculum revision
• A **common regional digital skills and competencies framework is in place.**	• Completion of a framework by 2030	Specific unit should be created and be responsible for this
• Schools and students are better **equipped to use**	• Number of digital tools and devices in school (broadband,	DTS implementation unit report from MS

digital tools and devices for teaching and learning, connectivity and IT infrastructure in schools are improved.	laptops, smartphones, projectors, etc)	

IMPACT evaluation indicators		
IMPACT	**Indicator, target, and date**	**Source verification**
• Digital Skills: SADC population is Digitally Skilled.	• Targets by 2030 include that: • 50% of formal labour force has basic digital skills; • 80% of youth have basic digital skills; • 90% of public sector employees have basic digital skills; • 50% of youth have advanced digital skills;	

Indicators for strategic intervention 6: Strengthen linkages, synergies, and closing gender gap in digital innovation entrepreneurship and research ecosystems

OUTPUT monitoring indicators		
Output	**Indicator, target, and date**	**Source of verification**
• **Academia-industry collaboration agreements** emerging technologies on digital innovation and 4IR are signed and implemented, envisaging namely the organisation of regional events.	• Number of academia-industry collaboration agreements signed every year; roughly 50 agreements by 2025. • Number of academia-industry events being developed in the region.; including a region-wide event every two years.	• MS and universities report to the DTS implementation unit.
• A **regional network of Centres of Excellence (CoE)** is supporting **regional researchers' collaboration** on digital innovation, emerging technologies and 4IR. Promoting the integration and cohesion of the regional research landscape.	• The regional network ensures regional integration in digital innovation, emerging technologies and 4IR; by the end of 2024, the regional network connects the various CoE with a minimum of 50 universities across the region.	• The Centres of Excellence report their research priorities and agendas, as well as their collaborations with universities from the region to the DTS implementation unit, every 6 months.
• **Mobility initiatives** are implemented **across** the region for students, researchers and professionals in digital research areas.	• Number and impact of mobility initiatives implemented by universities and public research centres in the region; the target for cross-country mobility initiatives, by the end of 2024, is 15	• NRENs are in contact with public universities to report to the DTS implementation unit on the number and impact of the mobility initiatives held.
• SADC has supported the MS in developing **programmes to close the gender gap** in digital innovation, emerging tech and 4IR, and to encourage women-led digital entrepreneurship.	• By 2030, MS efforts ensure gender equality in scientific careers and university-level programmes related to digital skills, emerging tech and 4IR.	• MS report to the DTS implementation unit on the programmes that have been developed, by public universities and research centres, to address the gender gap in digital skills, emerging tech and 4IR.
• Funding from the RDF is used by MS to put in place initiatives that address the gender gap in digital innovation, emerging technologies and 4IR.	• By 2028, all MS have sent proposals focusing on addressing the gender gap to be implemented under the RDF.	• The RDF committee reports to the DTS implementation unit.
• Through the regional observatory, **the gender gap in digital innovation across SADC is monitored** and continuously addressed.	• By 2028, all the information collected by public universities and research centres is sex-disaggregated.	• With support from public universities and research centres, MS and the relevant network of CoE report to the DTS implementation unit on (1) gender equality in scientific careers in the digital field, (2) gender equality in decision-making bodies related to research activity in the digital field, (3) gender in research content related to

		digital innovation, emerging technologies and 4IR.

OUTCOME evaluation indicators		
OUTCOME	**Indicator, target, and date**	**Source verification**
• SADC Centres of Excellence **related to digital innovation, emerging technologies and 4IR** do research contributing to implementing the SADC Industrialisation Strategy values chains and the RISDIP.	• The contribution of SADC CoE is visible in the implementation of the SADC Industrialisation Strategy values chains and the RISDIP.	• CoE report to the DTS implementation unit on the work done to support the implementation of the SADC Industrialisation Strategy and RISDIP.
• There is a better alignment between the academic degrees and the regional market /industry demand in terms of skills, qualifications and research for innovation.	• The gap between the regional academic offer and the qualifications required by the regional industry is closed by 2030.	• NRENs report to the DTS implementation unit on the results of consultative processes with public universities, research centres and key local industries.
• Specific plans and programmes are funded and implemented to close the **gender gap** in digital skills, emerging tech and 4IR, and to encourage women-led digital entrepreneurship in SADC MS.	• MS ensure the mobilisation of funds for and the implementation of programmes to close the gender gap in the relevant areas.	• MS report to the DTS implementation unit on the funds that have been allocated and the programmes that have been developed, by public universities and research centres, to address the gender gap in the relevant areas.

IMPACT evaluation indicators		
IMPACT	**Indicator, target, and date**	**Source verification**
• Significant increase in **digital innovation in SADC.**	• All MS have increased their capacities in digital innovation, and the number of public universities and research centres with programmes and research initiatives dedicated to digital innovation grows by +30%, by 2028.	• NRENs report to the DTS implementation unit on the programmes and research initiatives dedicated to digital innovation, emerging technologies and 4IR, implemented by public universities and research centres.
• **Emergence of a strong 4IR sector** support by qualified skills and research.	• By 2025, NRENs from each MS are fully operational and, by 2027, have a dedicated research strategy addressing 4IR.	• NRENs report to the DTS implementation unit.
• **Gender balance is achieved** in digital skills, emerging tech and 4IR, and women-led digital entrepreneurship is encouraged.	• By 2028, public universities, research centres and key industry players ensure gender equality in their activities on digital innovation, emerging technologies and 4IR (gender equality is ensured at three levels:	• NRENs report national data to the DTS implementation unit.

	careers, decision-making processes and the addressing of gender in research content).	

Indicators for strategic intervention 7: Promote funding, open access and dissemination in research for digital innovation

OUTPUT monitoring indicators		
Output	**Indicator, target, and date**	**Source of verification**
• MS agencies have developed plans and means to **mobilise new sources of funding for research and digital innovation**, emerging technologies and 4IR.	• By 2028, the percentage of the government budget in MS dedicated to research and innovation grows 50% and a parcel of it is specifically dedicated to digital innovation, emerging tech and 4IR.	• MS and NRENs report to the DTS implementation unit.
• Existing **NRENS have a greater capacity** to ensure research integrity across the region.	• In cooperation with CoE, NRENs efforts to ensure regional integration in research are visible in three areas: digital innovation, emerging technologies and 4IR.	• NRENs report to the DTS implementation unit.
• **New NRENs are set up** in countries where they did not exist.	• By the end of 2025, all MS have their NRENs fully operational.	• MS report to the DTS implementation unit.
• Universities in MS **implement the Regional Open Access Framework** and acquire licenses to access the main global research journals and platforms.	• By 2024, with support from NRENs, all universities across the region have implemented the Regional Open Access Framework.	• NRENs report to the DTS implementation unit.
• **Regional Open Distance Learning (ODL) Strategic Plan 2022-2030** is implemented.	• By 2024, universities in the region have built new or improved their physical and virtual infrastructure and relevant resources for dissemination purposes (open innovation) through the ODL Strategic Plan.	• With input from universities, NRENs report to the DTS implementation unit.

OUTCOME evaluation indicators		
OUTCOME	**Indicator, target, and date**	**Source verification**
• The majority of the SADC MS universities and research centres in the region have built new or **improved their infrastructure and have more resources**, generating a positive impact on research development.	• By 2028, key universities in the region (minimum of one per MS) have updated physical and virtual infrastructure and resources to significantly increase their research capacities in digital innovation, emerging technologies and 4IR.	• With input from universities, NRENs report to the DTS implementation unit.
• **NRENs and universities** from the region work collaboratively to move forward with **research integration** in the fields of digital innovation, emerging technologies and 4IR.	• By 2028, NRENs and universities work together to ensure national integration in research in the three relevant areas (digital innovation, emerging technologies and	• NRENs report to the DTS implementation unit.

	4IR), ensuring a basis for the regional integration led by SADC and the CoE.	

IMPACT evaluation indicators		
IMPACT	**Indicator, target, and date**	**Source verification**
• The **quality and quantity of research** in the field of digital innovation, emerging technologies and 4IR is significantly improved.	• The quality of the research on digital innovation, emerging technologies and 4IR developed in the region is recognised by the international community.	• Based on data from universities and research centres, NRENs report to the DTS implementation unit on key information yearly (e.g., percentage of publications by researchers from the region in scientific journals, participation of researchers from the region in international events, number of foreign researchers visiting universities in the region).