











Developing an Artificial Intelligence Maturity Assessment Framework for South Africa

First Annual Al Maturity Assessment 2025



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List of Abbreviations

4IR	Fourth Industrial Revolution	IMF	International Monetary Fund
ΑI	Artificial Intelligence	IP	Intellectual property
AI MAF AIISA	Al Maturity Assessment Framework Artificial Intelligence Institute of South	ISO	International Organization for Standardization
AlloA	Africa	ITU	International Telecommunications Union
AIPI	Al Preparedness Index	MOOCs	Massive open online courses
APIs	Application programming interfaces	MRC	Medical Research Council
AUDA-	African Union Development Agency – New	NACI	National Advisory Council on Innovation
NEPAD	Partnership for Africa's Development	NCPF	National Cybersecurity Policy Framework
BMZ	German Federal Ministry for Economic Cooperation and Development	NDP	National Development Plan
BRICS	Brazil, Russia, India, China and South Africa	NEMISA	National Electronic Media Institute of South Africa
CAIR	Centre for AI Research	NICIS	National Integrated Cyberinfrastructure
CAPS	Curriculum and Assessment Policy Statement	NRF	System National Research Foundation
CHPC	Centre for High Performance Computing	NRI	Network Readiness Index
CIPC	Companies and Intellectual Property Commission	OECD	Organisation for Economic Co-operation and Development
CIRT	Cyber Incident Response Team	PC4IR	Presidential Commission on the Fourth
CPD	Continuous professional development		Industrial Revolution
CSIR	Council for Scientific and Industrial	PLOS	Public Library of Science
CCIDT	Research	POPiA	Protection of Personal Information Act
CSIRT	Computer Security Incident Response Team	PSETA	Public Service Education and Training Authority
CUT	Central University of Technology	R&D	Research and Development
DBE DCDT	Department of Basic Education Department of Communications and	SADiLaR	South African Centre for Digital Language Resources
	Digital Technologies	SAICA	South African Institute of Chartered
DFIs	Development Finance Institutions	CADCLI	Accountants
DHET	Department of Higher Education and Training	SARCHI SASAS	South African Research Chairs Initiative
DSTI	Department of Science, Technology and Innovation	SAVCA	South African Social Attitudes Survey Southern African Venture Capital and Private Equity Association
DTIC	Department of Trade, Industry and Competition	SETAs	Sector Education and Training Authorities
EMIS	Education Management Information	SKA	Square Kilometre Array
LIVIIO	System	SLR	Systematic literature review
GCI	Global Cybersecurity Index	STEM	Science, Technology, Engineering, and Mathematics
GDP	Gross Domestic Product	Stats SA	Statistics South Africa
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit	TIMSS	Trends in International Mathematics and Science Study
GSMA	Global System for Mobile Communications Association	TUT	Tshwane University of Technology
HAI	Stanford Institute for Human-Centered Artificial Intelligence	TVET	Technical and Vocational Education and Training
HPC	High-performance computing	UAE	United Arab Emirates
HSRC	Human Sciences Research Council	UJ	University of Johannesburg
ICT	Information and Communication Technology	UNESCO	United Nations Educational, Scientific and Cultural Organization
IEEE	Institute of Electrical and Electronics	UWC	University of the Western Cape
	Engineers	WEF	World Economic Forum

Executive Summary

The South African AI MAF serves as a foundational tool for guiding the country's progress towards AI maturity and is tailored to the country's unique socioeconomic, cultural, and technological realities. It furthermore aligns with broader continental ambitions (i.e. African Union's 2024 Continental AI Strategy), which reflects a strong commitment to leveraging AI for sustainable development. This implies the ethical and inclusive development and implementation of AI in ways that address local challenges.

In South Africa, GIZ, through the FAIR Forward project, has collaborated closely with the Council for Scientific and Industrial Research (CSIR), the South African Institute of Chartered Accountants (SAICA) and researchers from the University of the Western Cape (UWC) to develop the AI Maturity Assessment Framework (AI MAF) for South Africa.

A design-science methodology was applied to develop the AI MAF for South Africa. The approach involved a structured literature review process, co-design workshops with cross-sectoral stakeholders, expert interviews, validation workshops and external expert review.

This first version of the AI MAF consists of eight domains:



Each domain includes sub-domains with specific indicators. A total of 68 indicators are included in this 2025 instrument, aimed at reflecting the country's unique socioeconomic, cultural, and technological realities.

An assessment instrument (rubric) to measure the level of maturity of these eight domains was adapted from the maturity measurement scale set out in ISO 37004 (Governance Maturity Model – Guidance). It reflects the structured progression of the ISO standards, employing a maturity scale that ranges from Level 0 (No evidence) to Level 5 (Continual optimisation or improvement). It is grounded in the principle of evidence-based assessment, evaluating maturity through the lens of activities and inputs (Levels 1–2) that lead to measurable outcomes and impact (Levels 3–5).

Level 0: Undefined	No evidence can be found of commitment to or application of the principle. Not measurable.
Level 1: Limited	Where evidence is available, it is limited to that of performing the minimum necessary to achieve the intent of the principle.
Level 2: Emerging	Evidence is available and managed.
Level 3: Formalised	Evidence is available, managed, and aggregated to form a cohesive system in which emergent behaviours can be observed.
Level 4: Measured	Evidence is available, managed, and aggregated, and it is measured or assessed.
Level 5: Optimising	Evidence is available, managed, aggregated and measured or assessed, and it is optimised for continual improvement.

The application of this instrument in the first iteration of assessing Al maturity in South Africa indicated that the country is in the early stages of Al maturity, with seven of the eight domains assessed at Levels 1–2 on the maturity scale, and only one domain reaching Level 3. This suggests that all domains demonstrate some level of foundational 'input activities', signalling a positive intent and growing awareness of the importance and relevance of Al, with some initial movement towards demonstrating positive outcomes.

Domain	Weighted score (max = 5)	Maturity
International and Continental Profile as Al Leader	1.4	Limited: Some documented evidence of engagement and action towards building an International and continental profile as an Al leader. Minimal associated activities.
Enabling Regulatory Environment	2	Emerging: Initial actions and evidence of national movement towards creating an enabling regulatory environment, though still low-ranking or lacking full impact. Visible activity but no clear, documented impact.
Citizen Engagement With and Empowerment Through Al	2.1	Emerging: Evidence is available, and associated actions have been initiated. Aggregation of initiatives and emergent behaviours is not yet evident.
Education and Workforce Enablement	1.9	Limited to Emerging: Documented evidence of engagement and action towards AI education and workforce enablement. Associated activities are emerging but not yet evident for all indicators.
Innovation and Research	1.6	Limited to Emerging: Documented evidence of engagement and action towards AI innovation and research capability development. Associated activities are not yet evident for all indicators.
Growth of the AI Ecosystem	1.3	Limited: Documented evidence of engagement and action towards the growth of the AI ecosystem. Associated activities are not yet evident for all indicators.
Data and Digital Infrastructure	2.1	Emerging: Initial actions and evidence of national movement towards creating an enabling data and digital infrastructure, though still low-ranking or lacking full impact.
Security and Privacy	3	Developing: Evidence of implementation of security and privacy activities is available. Activities have been initiated/approved and aggregated, and emergent behaviours can be observed.

Overall, the generally low maturity scores indicate that progress across the domains is fragmented. This could be attributed to still limited strategic ecosystem coordination, targeted investment and capability building.

The evidence-based approach enables a reflection of the South African landscape and supports strategic alignment across government, industry, and academia. **The**

framework and interactive dashboard – developed through this project to enable accessible visualisation of the data – serve as foundational reference points for supporting South Africa's evolving AI ecosystem. An AI agent developed as part of the initiative facilitates regular updates, helping ensure that the AI MAF remains a relevant strategic tool.

While not exhaustive or prescriptive, the framework, including its sub-domains and indicators, provides a baseline from which stakeholders can build, adapt, and localise in alignment with their sectoral priorities and citizen needs. Continued refinement and contextual application are encouraged to foster a responsive, data-driven national AI ecosystem.

As the global AI ecosystem advances with increasing momentum, South Africa must keep pace and uphold its continental commitments. A shared, regularly updated, evidence-based fact sheet such as the AI MAF can support a whole-of-society approach and facilitate meaningful partnerships between government, industry, civil society, and research institutions to help realise the full potential of AI for societal benefit.



Section 1

Context of the **Initiative**

This section:

- Introduces the Artificial Intelligence Maturity Assessment Framework
 (AI MAF), developed as part of the FAIR Forward Artificial
 Intelligence for All initiative, which aims to assess South Africa's
 readiness for Al integration;
- Provides both the rationale and objectives for a locally relevant
 Al MAF guided by international standards, while tailored to South
 Africa's unique socioeconomic and technological context, ensuring
 alignment with local needs and realities;
- Outlines key concepts and definitions central to the framework, such as the theory of change and the working definition of artificial intelligence (AI); and
- Provides guidance on how to navigate the remainder of the report.

1.1 Introduction

The project core team, comprising of FAIR Forward – Artificial Intelligence for All, CSIR, the Council for Scientific and Industrial Research (CSIR), the South African Institute of Chartered Accountants (SAICA) and researchers from the University of the Western Cape (UWC), have collaborated to develop an Al Maturity Assessment Framework (Al MAF) for South Africa. The initiative is supported by the Department of Communications and Digital Technologies (DCDT) and the Department of Science Technology and Innovation (DSTI); and aims to contribute to the department's national Al plan.

1.2 Objective of the Artificial Intelligence Maturity Assessment Framework for South Africa

The Artificial Intelligence Maturity Assessment Framework (AI MAF) for South Africa was developed to serve as a foundational tool for guiding the country's progress towards AI maturity. Unlike global benchmarking tools that focus on direct cross-country comparability, this framework is tailored to South Africa's unique socioeconomic, cultural, and technological realities.

Its primary objective is to assess national preparedness for the adoption and implementation of AI, both in terms of institutional readiness and the availability of expertise and capabilities. By offering country-specific insights, the framework aims to support strategic, evidence-based decision-making, particularly at the governmental level, while remaining relevant for organisations and individuals seeking to develop their own context-appropriate AI maturity models.

The development of this framework is aligned with broader continental ambitions, including the African Union's 2024 Continental AI Strategy, which reflects a strong commitment to leveraging AI for sustainable development. If strategically deployed, AI could contribute as much as USD 15.7 trillion to the African economy by 2030, potentially resulting in a 26% boost in GDP for local economies.² Realising this potential, however, requires that AI be developed and implemented ethically, inclusively, and in ways that address local challenges.

Recognising that many international frameworks are based on the priorities and resources of developed countries, the AI MAF intentionally departs from one-size-fits-all models. It offers a flexible and adaptive structure grounded in global standards – specifically ISO 37004 – while responding to the distinct barriers and strengths of the Global South. The reviewed domains (e.g. education, regulatory environment, and data and digital infrastructure) are contextualised in accordance with South Africa's broader development trajectory. Ultimately, it strives to provide an accurate and locally relevant view of South Africa's AI readiness and maturity, serving as a strategic tool for guiding responsible AI development.

The initial phase of work consisted of a co-designed foundational AI MAF, and an initial AI maturity assessment of South Africa derived from the application of the framework (see Figure 1). This served as input for the development of an interactive dashboard, hosted by the CSIR. It is anticipated that, given the dynamic nature of AI developments, the instrument and dashboard will need to be refined and updated annually. Refinements to the foundational framework will provide an evolving view of AI maturity in South Africa.

Figure 1: AI MAF project outputs³



Development of framework

Develop a framework (through a comprehensive situation and data analysis) that evaluates the country's AI readiness and maturity.

future.



Annual Al maturity readiness evaluation

Publish an annual report, commencing in 2025, on the state of AI readiness of South Africa.



Public dashboard

Design and develop an online, interactive data-visualisation dashboard supporting framework and annual reporting process. This dashboard will be openly accessible (a digital public good) and housed and maintained at the CSIR.



Inform policy and practice

Formulate policy recommendations based on insights, data, and situational analysis to inform AI policy development.

1.3 A theory of change and the South African context

A theory of change is a conceptual model that outlines how an initiative expects to bring about change by explicitly identifying the assumptions, strategies, and anticipated outcomes that drive the process. In essence, it is a journey undertaken from the starting point (current state) to the desired destination (intended outcome), via curated interventions and/or targeted actions. By mapping the journey from the initial intervention and activities to the intended effects it provides a structured blueprint that clarifies the interconnected components of a complex initiative. This strengthens strategic planning and helps stakeholders think critically about how change will unfold, where to allocate resources, whose voices to include, and how to measure progress effectively. Ultimately, a theory of change fosters consensus on what success looks like and how it will be achieved, ensuring that efforts remain aligned with overarching goals.

A theory of change is not a one-size-fits-all model; rather, it can be tailored to reflect the unique goals, constraints and dynamics of different interventions. This adaptability is particularly relevant to the AI MAF, which provides contextualised insights into AI readiness and maturity across key AI domains in South Africa. By offering a foundation for individual, organisational, and governmental stakeholders, the AI MAF supports informed decision-making, strategy development, and the establishment of indicators and outcome measures. In doing so, it enables stakeholders to develop and tailor a theory of change aligned with their specific objectives and vision for AI development in South Africa. Ultimately, this contributes to the broader goal of harnessing AI to drive economic growth, address social challenges, enhance global competitiveness, promote inclusivity, and prepare for the

Given the emphasis on a tailored and localised AI MAF and theory of change, a deep understanding of the South African landscape and its dynamics is essential. An upper-middle-income country, South Africa boasts the most industrialised economy in Africa, but remains one of the most unequal societies globally, with a 2024 Gini coefficient⁶ of 0.63, the highest in the world.⁷ Despite a GDP of USD 419 billion, economic disparity persists, with a forecasted unemployment rate of 33.9% (8.89 million people) in 2025 and labour productivity at USD 11.87 per hour. The total population is expected to reach 64.75 million in 2025, with 15.82 million households.⁸ Nearly 18.5% of South Africans live on less than USD 2.15 per day, reflecting ongoing socioeconomic struggles.⁹

In response to these challenges, the South African government formulated the National Development Plan (NDP) 2030,¹⁰ aiming to eradicate poverty and reduce inequality by 2030. The NDP emphasises uniting South Africans, fostering an inclusive economy, enhancing capabilities, and strengthening state capacity. Key objectives include increasing employment through economic growth, improving the quality of education and training, and building a capable state to drive development. The plan also underscores the importance of active citizenry and leadership in achieving these goals. However, it is clear that the targets set out in the NDP will not be achieved by 2030.

The theory of change for this AI MAF initiative was based on the premise that advancing AI in South Africa requires a clear understanding of the country's AI maturity. To establish this baseline, an assessment framework was developed to identify gaps in AI capability, adoption, and governance. This evidence would inform targeted interventions – such as policy reforms, skills (re)development, and infrastructure investment – to bridge disparities in identified sectors and accelerate AI-driven growth. Over time, these interventions enable a more inclusive and competitive digital economy, where AI supports equitable access to opportunities and drives sustainable development. Notably, as the ecosystem evolves, the elements of the framework can be adapted to the country's context.

1.4 Defining artificial intelligence for the purpose of this initiative

To ensure conceptual clarity, a formal definition of AI was required in the context of this initiative. The definition outlined in the Organisation for Economic Co-operation and Development (OECD) Recommendation on AI (the "AI Principles"), originally published in 2019 and revised in 2023, was selected for this purpose. Notably, the OECD deliberately avoids defining 'artificial intelligence' itself, opting instead to define an 'AI system' – a concept deemed more practical and actionable, particularly in policymaking contexts. According to the OECD:¹¹

An Al system is a machine-based system that, for explicit or implicit objectives, infers, from the input it receives, how to generate outputs such as predictions, content, recommendations, or decisions that can influence physical or virtual environments. Different Al systems vary in their levels of autonomy and adaptiveness after deployment.

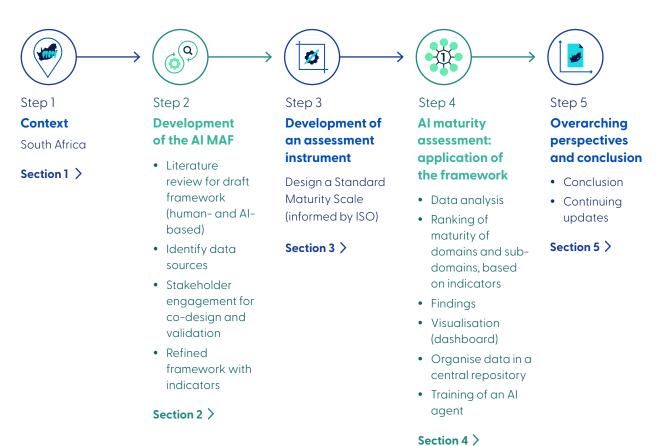


1.5 How to read the report

This report outlines the unique journey of developing an Al MAF for South Africa and its first application. The remainder of the report reflects the approach underpinning this initiative, organised into four sections plus an annexure that are illustrated in Figure 2 and briefly summarised below.

The framework, along with the research material generated, is open-source. Adoption or adaptation of the framework is highly encouraged.

Figure 2: Approach to the Al Maturity Assessment Framework design and application



Section 2: Development of the Al Maturity Assessment Framework

This section describes the design science approach followed in developing the AI MAF. This process involved:

- A human- and Al-based literature review;
- The design of a first draft framework;
- Co-design workshops with cross-sectoral stakeholders; and
- A validation process that led to a refined framework comprising eight distinct domains, sub-domains, and corresponding indicators and data sources.

Section 3: Development of the Al Maturity Assessment Instrument

This section describes the approach taken in designing and applying an ISO 37004-inspired five-point maturity assessment instrument.

Section 4: First Al Maturity Assessment – Application of the framework

This section presents the outcome of the AI maturity assessment, in which the research team used the five-point assessment instrument to determine the maturity level for each of the eight domains (see Figure 5). The results form the baseline for South Africa's AI maturity profile. This dataset was subsequently visualised on an interactive dashboard. A local AI agent was trained to replicate and scale the assessment process, enabling ongoing updates to South Africa's AI maturity profile.

Section 5: Conclusion

This section presents a high-level overview of AI maturity in South Africa across the eight domains, along with concluding remarks on the value and relevance of the AI MAF and its measurement instrument, and the importance of their ongoing refinement.

The report concludes with five **annexures**, which present:

- Draft Al Maturity Assessment Framework Version 1;
- Stakeholder engagement (expert interviews and workshops);
- Project team;
- AI MAF Data Sources; and
- Al Maturity Assessment Instrument.



Section 2

Developing the Al Maturity Assessment Framework

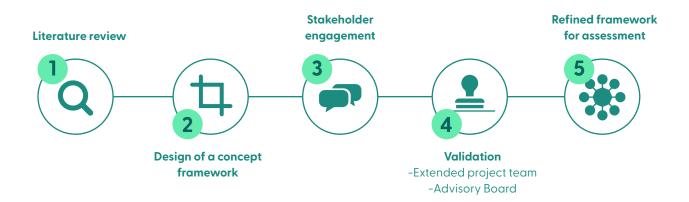
This section:

- Describes the rigorous, systematic process undertaken to develop the AI MAF, employing a hybrid methodology of human-led literature reviews and AI-driven analysis;
- Details the engagement process involving extensive consultations and validation with cross-sectoral stakeholders through expert interviews and interactive workshops; and
- Ultimately refines a framework structured around defined domains and indicators relevant to South Africa.

2.1 Introduction

A design science methodology¹² was adopted for the development of the AI MAF. The process consisted of the following phases: literature review, the design of a first draft framework, co-design workshops with cross-sectoral stakeholders, refinement of the draft framework, and a validation process leading to a refined framework. This process is illustrated in Figure 3 below:

Figure 3: Process followed in the development of the AI Maturity Assessment Framework



The following discussion provides the details of each of the steps in the process.

2.2 Literature review

For the development of a draft AI MAF, a three-step literature review approach was applied consisting of (1) a human-directed systematic literature review (SLR), (2) an AI-based review, and (3) a comparative analysis and integration of the two approaches to provide a first comprehensive conceptualisation of relevant domains, sub-domains and indicators for inclusion in the draft AI MAF.

Human-based literature review

The human-directed SLR is a powerful tool that ensures no pertinent studies and frameworks are overlooked in the development of the AI MAF. It facilitates a thorough exploration of the existing literature, preventing crucial insights from being missed. This methodical compilation of data provided a robust knowledge base for the framework's development, ensuring its comprehensiveness and relevance.

The SLR, guided by strict inclusion and exclusion criteria, ensured a meticulous evaluation of the existing literature. It provided a solid foundation by synthesising insights from sources such as global Al maturity assessment indices – for instance, the Government Al Readiness Index, Stanford's Al Index, and the Global Index on Responsible Al – as well as national and regional indices from countries like the United Arab Emirates (UAE), Canada, Kenya, Rwanda, and India. Key publications, including from the Organisation for Economic Co-operation and Development (OECD), the United Nations Educational, Scientific and Cultural Organization (UNESCO), and the Group of 20's roadmap for Al governance, also informed the framework, ensuring relevance to both emerging economies and the global context.

The **inclusion criteria** focused on studies, policy documents, legislation, and frameworks related to Al maturity models within the past decade, ensuring alignment with current technologies. They stipulated the inclusion of:

- Studies that explicitly discuss Al maturity models or frameworks:
- Focus on global, country, and sector-wide frameworks; and
- Publications from the last ten years to ensure relevance to current technologies.

The **exclusion criteria** ruled out small-scale or tangential studies and focused clearly on comprehensive, sector-wide frameworks. They stipulated the exclusion of:

- Small-scale studies and exploration of AI maturity on a small scale; and
- Studies that do not specifically focus on Al maturity, but rather on digital maturity.

Al-driven process

The Al-driven parallel process enhanced the SLR to develop an Al MAF for South Africa by running concurrently with traditional methods before integration, which enhanced the overall analysis.

Key components:

- Automated data extraction: Al tools use natural language processing to rapidly
 extract and organise key data from a wide range of sources, improving the speed
 and consistency of data handling.
- Pattern recognition: All algorithms identify patterns and trends across the data, pinpointing prevalent themes and gaps that are crucial for framework development.
- **Scalability:** The AI process easily adjusts to include novel studies, keeping the framework relevant and current.

Comparative analysis

A comparative analysis was conducted after both the SLR and Al-driven reviews were completed. Al-generated insights were cross-referenced with human-reviewed data, enabling a comprehensive synthesis of the key trends and themes that emerged. This dual-review approach provided a more nuanced understanding of the global and country-level Al maturity landscape, ensuring the framework aligns with international standards while remaining tailored to the South African context. This comparative process provided the first comprehensive draft framework.

- Complementary analysis: Post-analysis, Al-generated insights were integrated with human-reviewed data to enhance the depth and accuracy of the literature review.
- **Efficiency boost:** All accelerated the initial data processing, allowing researchers to focus on detailed analysis and interpretation.
- Dynamic updating: The iterative AI process allowed for continuous refinement of the framework as new data emerged.

This parallel approach, illustrated in Figure 4 below, ensured that the AI MAF is comprehensive, current, and robust, effectively supporting AI strategy and policy development in South Africa.

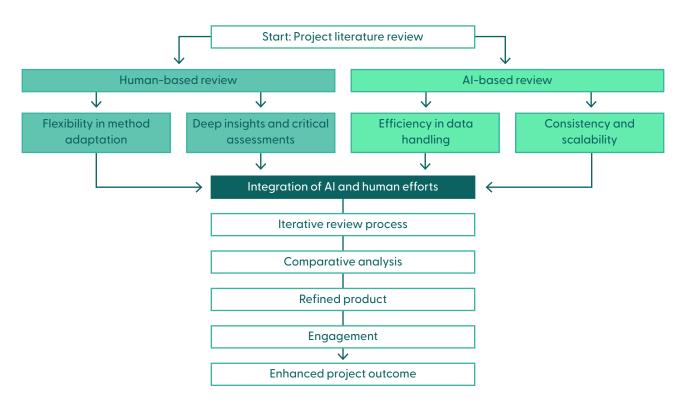


Figure 4: Approach to literature review applied in the study

2.3 First draft design of the AI MAF

Following the literature review, the first draft of the AI MAF was designed for use during the consultation and co-design process. The framework was structured to measure maturity both vertically and horizontally. The horizontal axis measures maturity on a particular domain on a five-point scale (from less to more mature), whereas the vertical axis measures progress in terms of four broad development stages, from AI inclusion and readiness (Level 1) to AI as a sustained growth driver (Level 4).

Fourteen domains were identified and grouped into four phases of maturity: inclusion and readiness, implementation and innovation maturity, transformational maturity, and AI as a sustained growth driver. This draft served as the basis for the co-design process, as described in Section 2.4. (See Annexure 1 for the first draft of the AI MAF.)

2.4 Stakeholder engagement

The stakeholder engagements comprised a two-step process:

- Individual interviews with AI experts; and
- In-person, cross-sectoral stakeholder workshops in Johannesburg and Cape Town.

The purpose of the interviews and co-design workshops was to elicit stakeholders' participation and contribution in further designing and refining the framework.

Expert interviews were conducted with six professionals experienced in Al-related matters. The interviewees were selected from the government, industry, academic, and research sectors to ensure a diversity of perspectives and to test the draft framework

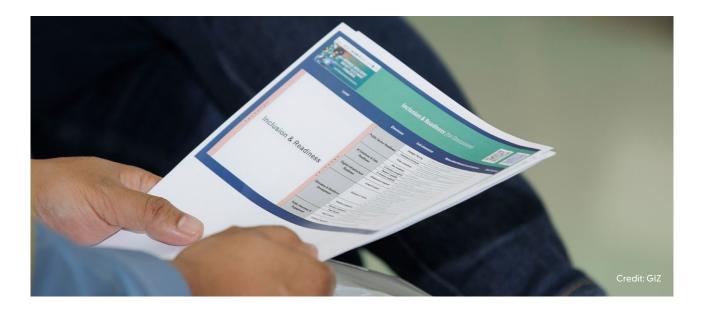
for potential sectoral and other biases. The experts commented on the logic of the vertical and horizontal assessment of maturity approach, the appropriateness of specified domains and indicators, and any other related aspects.

Two co-design workshops were organised to enable the cross-sectoral participation of stakeholders in the design and refinement of the framework.

The first workshop was hosted in Johannesburg and the second in Cape Town, with representatives from government, industry, academic and research institutions, and community organisations participating. An interactive and open co-design process was followed to maximise delegate participation in the framework design. The input focused on the relevance and applicability of the specified domains and indicators, potential data sources for inclusion in the framework, and the extent to which the framework succeeded in reflecting the realities of the South African context. (See Annexure 2 for a high-level summary of the workshop process.)

The following key design principles were distilled from the stakeholder engagements and applied in refining the framework:

- The framework should ideally focus on a few key domains, each comprising various sub-domains. The maturity assessment should be done on a horizontal level, as opposed to the horizontal and vertical levels proposed in the first draft.
- Indicators within domains should be prioritised based on the availability of resources.
- Diverse data sources should be included to provide **accurate perspectives** on the national context.
- Indicators must reflect the South African context (i.e. geographical and socioeconomic aspects, such as gender, age, rural-urban distribution). Al and digital readiness frameworks constructed for Kenya and Rwanda were considered good references in this respect.
- Indicators should be included selectively to **allow for comparison** with the international benchmarks.
- The framework was ultimately aimed at providing a **national perspective**; however, potential for portraying sectoral nuances should also be considered.
- Using numbers in the assessment rubric should be reconsidered, as this could be problematic.



2.5 Validation workshops

The expert interviews and stakeholder feedback informed the refinement of the draft framework. The interpretation of stakeholder feedback and framework refinement was validated against (i) the extended project team and (ii) the Al Advisory Board guiding the framework development process. The refined framework, as presented in Section 2.6, resulted from the extensive engagements with stakeholders and the validation process.

2.6 The domains of the Al Maturity Assessment Framework

The following section provides a detailed description of the refined framework, including the domains, sub-domains, indicators, and data sources. (See Annexure 4 for a full list of data sources.) The refined framework comprises eight key domains (see Figure 5):

Figure 5: Eight domains are included in the AI MAF



Domain 1: International and Continental Profile as Al Leader

This domain evaluates South Africa's positioning and recognition as an AI leader both globally and within the African continent. Recognition as an AI leader enhances a country's global influence, economic attractiveness, and technological sovereignty. Countries that actively engage in AI policy leadership, international AI standards-setting, and investment in AI-driven innovation strengthen their strategic positioning in global AI ecosystems. A strong international and continental AI profile is critical for economic competitiveness, technological collaboration, sustainable development and policy influence.

Metrics considered in this domain include:

- South Africa's Al leadership rankings;
- Benchmarking against peer countries;
- Hosting and participation in Al leadership events;
- Global recognition for responsible Al;
- Contribution to and adoption of ISO Al and other standards; and
- Sustainable Al investment and procurement initiatives.

Data sources include the Stanford Al Index reports,¹³ the Government Al Readiness Index,¹⁴ government reports, international benchmarking studies, and event-tracking platforms (see Table 1).

Table 1: International and Continental Profile as Al Leader: sub-domains, indicators, and data sources

Sub-domains	Indicators	Data sources
Recognition on	Status of recognition for Al leadership, competitiveness and/or maturity of Al industry, as evidenced in ranking in global Al indices	Stanford Human-Centered Al Index
global Al indices		General official and academic studies
	as evidenced irramking irr global / irrances	SA government databases
	Status of benchmarking against peer	Stanford Human-Centered Al Index
	countries such as the UAE, Kenya, Rwanda, India, and BRICS nations, as evidenced in	Government Al Readiness Index
	ranking in global Al indices for Al leadership,	General official and academic studies
	competitiveness, and/or maturity	SA government databases
Hosting and	Status of Al leadership events hosted in South	Event platforms (e.g., Eventbrite, conference
participation in	Africa (specifically national events, continental events, and global events)	alerts)
leadership events		University and research institution event listings
		Tech hub event calendars
		Google trends
	Status of participation of South African Al leaders in global and African forums and conferences, specifically in leadership roles	Event platforms (e.g., Eventbrite, conference
		alerts)
		University and research institution event listings
		Tech hub event calendars
Responsible Al recognition	Status of recognition for responsible AI (ethical and sustainable AI practices), as evidenced in the ranking on The Global Index on Responsible AI	The Global Index on Responsible AI

Sub-domains	Indicators	Data sources
Al best practice	Status of adoption of (new) ISO Al-related	Government performance reports
adoption	standards	Industry feedback
		Academic studies
Sustainable Al investment	Status of funding allocated to green AI R&D focused on energy-efficient AI algorithms, hardware, and infrastructure	CSIR, DSTI, and NRF documents/publications
Sustainable AI procurement	Status of government AI procurement policies and initiatives supporting responsible AI (ethical and sustainable AI), including environmental impact assessments	Reports of the Southern African Legal Information Institute
		DCDT National Artificial Intelligence Policy Framework for South Africa
		General official and academic studies
		SA government databases
	Status of green (sustainable) Al guidelines that promote the development of energy-efficient Al models and the use of renewable energy sources in Al infrastructure	Reports of the Southern African Legal Information Institute
		DCDT National Artificial Intelligence Policy Framework for South Africa
		General official and academic studies
		SA government databases

Background and motivation

Leading AI economies, such as the United States, China and the United Kingdom, consistently rank high in global AI indices and actively shape international AI governance.^{15,16}

Within Africa, Rwanda, Kenya, Egypt, and Mauritius have positioned themselves as Al innovation hubs through strategic government policies, Al investment incentives, and participation in continental Al initiatives. Rwanda, for example, has developed an Al policy framework to integrate Al into national development goals.¹⁷ Kenya has prioritised Al research and entrepreneurship, attracting global Al investments and research collaborations.¹⁸ Mauritius has actively promoted adopting Al standards and industry-driven Al strategies to accelerate its digital transformation agenda.¹⁹

In addition, sustainable AI investment and green AI initiatives are gaining traction globally. Countries leading in green AI R&D and procurement, such as Germany, Sweden, and Canada, have integrated AI-driven sustainability measures into national AI policies. Sustainable AI procurement ensures AI-driven solutions align with energy-efficiency and carbon-reduction goals, while green AI R&D funding promotes the development of low-energy AI models and eco-friendly infrastructure. Within Africa, Rwanda and Kenya have begun incorporating sustainable AI practices, emphasising renewable energy-powered AI infrastructure and green AI research programmes.

To maintain relevance in the AI leadership space, South Africa must invest in AI sustainability, fostering ethical and environmentally responsible AI development and procurement strategies.

Domain 2: An Enabling Regulatory Environment

This domain measures the maturity of the ethical and legal framework/ environment to support the responsible adoption of Al across sectors in South Africa.

The indicators include existing AI ethics guidelines, AI regulatory frameworks and the number of AI-related regulations enacted, and the review frequency of AI-related laws.

Data are obtained from sources such as government databases containing legislation, policies/white papers, and speeches by government officials; international Al indexes; and official reports and academic literature (see Table 2).

Table 2: Enabling Regulatory Environment: sub-domains, indicators, and data sources

Sub-domains	Indicators	Data sources
Strategic planning	Status of a national broad-based Al strategic	Government AI Readiness Index
performed	and/or policy framework, and other sectoral, supportive and enabling policies (such as	Global Index on Responsible AI
	data, digital, cloud and cybersecurity, etc.)	Document reviews
Governance structures implemented	Status of a national AI governance body, and government departments and agencies addressing AI-related policy	Al Institute of South Africa
Regulatory frameworks formulated and enacted	Status of Al-specific regulation and the number of Al-related laws enacted	Government databases
Codes of conduct implemented	Status of government-developed code(s) of conduct to guide ethical and trustworthy Al adoption across institutions	Government documents, publications
Parliamentary oversight of AI (policy, regulation, and enforcement)	Status of a parliamentary committee performing oversight of departments and agencies responsible for Al-related policy, regulation and enforcement	Government databases
Compliance	Status of AI policy alignment and regulation compliance mechanisms/frameworks, including responsible AI, by participants in the ecosystem	Parliament database
Trained public servants (civil	Evidence of training of public servants/ regulators/policy makers in Al-related	Public Service Education & Training Authority (PSETA) data
servants, the judiciary, policy makers, and regulators)	competencies	National School of Government (NSG) database

Background and motivation

The report of the Presidential Commission on the Fourth Industrial Revolution²¹ and the DCDT Discussion Document on Al²² recognise regulation as an important pillar that will create an enabling environment for public and private actions on Al and support the ethical, transparent, and responsible adoption of Al technology in South Africa. Following the approach of other jurisdictions,²³ South Africa is in the process of developing a national Al policy framework and national Al strategy.

Recent studies^{24,25} have identified different approaches to the national regulation of Al from which South Africa can draw inspiration.

- Some Al regulations conform to the core principles of transparency, sustainability, respect for human rights, and strong risk management.
- Some are situated within the broad digital policy priorities, such as human rights, data privacy, cybersecurity, and intellectual property.
- Others adopt a risk-based approach in the sense that they focus on the perceived risks of AI to core values such as security, privacy, transparency, and non-discrimination.
- Some regulatory systems adopt tools that allow businesses to test and experiment
 with new and innovative products, services, or businesses under the supervision
 of a regulator for a limited period of time (regulatory sandboxes).
- Others use executive orders as an Al regulatory tool.
- Still others adopt a sectoral approach based on the various aspects of society affected by AI referred to as a piecemeal approach.²⁶

Whatever approach South Africa adopts, it is important for the national regulatory framework that it is homegrown and responsive to the particular needs of the country. This is necessary to effectively harness the benefits of AI while addressing its challenges, to attain the development objectives set out in the National Development Plan.²⁷

Even so, an enabling regulatory environment should not be perceived through the limited prism of AI regulation. Instead, this MAF conceives of such an environment as an amalgam of strategic planning, governance structures, regulatory frameworks, codes of conduct, parliamentary oversight, policy compliance, and trained public servants.

Key to Al development, adoption, and use:

- Effective strategic planning by the government sets key priorities and directions for the public and private sectors.
- Governance structures, such as national departments or AI agencies, are important for effective management, coordination, and regulation.
- Regulations provide legal standards and the legal infrastructure for Al governance.
- Al codes of conduct ensure ethical, responsible, and consistent adoption of Al.
- Parliamentary oversight monitors and assesses the implementation of Al policies and laws by public agencies.
- Measuring the number of trained public servants and the quality of Al training programmes for public servants calculates the government's digital transformation capacity.

Domain 3: Citizen Engagement With and Empowerment Through Al

This domain deals with aspects related to the public's perception of and engagement with AI technologies. It also focuses on the extent of internet use across the population, particularly geographic (rural-urban) location, gender, and mobile data affordability disparities. This approach ensures that AI maturity is not only measured through technological and infrastructural advancements, but also through societal and human-centred considerations.

The domain relies on diverse data sources, including national public opinion surveys such as the Ipsos AI Monitor, social media sentiment analysis, media monitoring, government reports, and international studies on internet use and disparities.

Key sources include the International Telecommunications Union (ITU), Statistics South Africa (Stats SA), and Research ICT Africa After Access reports and data hubs (see Table 3).

Table 3: Citizen Engagement With and Empowerment Through AI: sub-domains, indicators, and data sources

Sub-domains	Indicators	Data sources
Public perception	Status of mechanism(s) to assess public	OECD.Al Policy Observatory
of Al	awareness of AI	Ipsos Al Monitor
		South Africa Social Attitudes Survey (SASAS)
Public engagements	Status of government-led Al-related public engagement events (i.e. conferences, seminars and workshops)	Google Trends
Access and inclusion	Status of growth in the total population that uses the internet (households or individuals)	Statistics South Africa (Stats SA) General Household Survey
		International Telecommunication Union (ITU) ICT Statistics
		Research ICT Africa: After Access
	Status of gender parity in internet usage	Research ICT Africa: After Access
	Status of rural/urban parity in internet usage	Statistics South Africa (Stats SA) General Household Survey
		International Telecommunication Union (ITU) ICT statistics
		Research ICT Africa: After Access
	Status of SA mobile data affordability as measured in the mobile data affordability ranking	International Telecommunication Union (ITU) ICT Statistics
		GSMA Mobile Connectivity Index

Background and motivation

The OECD AI principles highlight that public trust in AI is crucial for its diffusion and adoption, advocating for a well-informed, whole-of-society public debate to raise awareness of AI's benefits while mitigating the associated risks.²⁸ Several countries have adopted structured citizen engagement strategies to enhance AI literacy and trust.

Canada's national AI strategy employs a whole-of-society approach through the Public Awareness Working Group, featuring a national survey on AI literacy and perceptions, online workshops on responsible AI use, and a report with recommendations for ongoing engagement. Similarly, the United Kingdom government uses a tracker survey to monitor public attitudes, supporting the Centre for Data Ethics and Innovation in promoting trustworthy AI innovation.

These examples underscore the importance of establishing structured mechanisms to assess public perception, namely the status of public awareness, attitudes, and government-led engagement events.

South Africa's NDP 2030 envisions universal and affordable internet access. While there have been improvements in broadband penetration over the years, many South Africans still face barriers to connectivity, particularly in more rural and remote areas, where a persistent rural-urban disparity exists.^{29,30} Other barriers include high data costs and different levels of digital literacy, which hinder widespread public engagement with and trust in Al. Without addressing these disparities, Al adoption will remain limited to those with reliable and affordable connectivity, reinforcing existing socioeconomic divides.





This domain refers broadly to a country's capacity to educate its population on digital skills and, more specifically, in terms of science, technology, engineering, and mathematics (STEM) and Al-related skills, knowledge, and competencies. It furthermore covers the ability of the country to continuously develop the skills of its workforce to adapt to technological advances.

The domain therefore encompasses formal (secondary and tertiary) education initiatives and includes indicators such as matric pass rates in STEM subjects and university admission and throughput, with specific reference to STEM-related degrees at the graduate and postgraduate levels. Regarding workforce enablement, indicators include the availability of AI-related courses and training material, and the budget spent on digital and AI-related skills development initiatives. On a country level, it incorporates an increased AI-skilled workforce and AI skills migration.

Data are typically obtained from various sources, including national education statistics, such as the Higher Education Management Information System (HEMIS), national government reports (i.e. Department of Basic Education, Department of Higher Education) and international studies (i.e. the Global Index on Responsible AI,³¹ Stanford HAI³²) (see Table 4).

Table 4: Education and Workforce Enablement: sub-domains, indicators, and data sources

Sub-domains	Indicators	Data sources
Education and training	Status of digital literacy proficiency among the general population	Research ICT Africa: After Access, Stats SA, Network Readiness Index (NRI)
	Status of integration of Al-related topics into the education curriculum (at Grades 7 and 12 levels)	Ministry of Education curriculum documents (CAPS)
		Department of Basic Education policy reports
	Oracles 7 drid 12 levels)	Education Management Information System (EMIS)
	Status of students matriculating with	Ministry of Education curriculum documents (CAPS)
	STEM subjects	Department of Basic Education (DBE) reports
		Education Management Information System (EMIS)
		Institutional Information and Data Systems Consultants (IDSC)
	Status of AI vocational training and certification programmes available nationally	Vocational training institutions
		Certification bodies
		Education ministry record
		Sector Education and Training Authorities (SETAs)
		Technical and Vocational Education and Training (TVET) Colleges
		Quality Council for Trades and Occupations (QCTO)
	Status of graduates (Bachelor's, Master's, PhD degrees) in STEM fields	Educational statistics from national databases, universities, and educational institutions
		Higher Education Management Information System (HEMIS)
	Status of development and accessibility of STEM-related tertiary education programmes	University programme catalogues, enrolment statistics
	Status of students enrolled in AI and	University enrolment data
	data science programmes at tertiary institutions	Higher Education Management Information System (HEMIS)

Sub-domains	Indicators	Data sources
Workforce enablement	Status of Al courses available in English as reflected in OECD data	OECD.Al Policy Observatory (education and training)
		Study portal
		Council for Scientific and Industrial Research (CSIR)
	Status of diversity in AI talent (e.g., women, underrepresented minorities)	National statistics on Al diversity (e.g., women, underrepresented minorities) within the workforce and academia
		Stanford Human-Centered Artificial Intelligence (HAI) – Al Index
		OECD.AI Policy Observatory
		University and company diversity reports
	Status and extent of AI skills migration	OECD.AI Policy Observatory
	Status of participation in Al-related training programmes within the various SETAs	Official Sector Education and Training Authorities (SETA) websites
		Publications by organisations like Deloitte, PwC and local industry bodies on Al skills demand and training effectiveness
	Status of availability and uptake of Al-	University programme catalogues
	related micro-credential programmes in South Africa	Status of availability of and uptake of Al-related micro-credential programmes in South Africa through national and international platforms e.g., Coursera, EDx, Khan Academy, Datacamp
	Status and uptake of Al-related learning content in continuous professional development (CPD) programmes across sectors	Department of Basic Education (DBE) reports (for teacher education)
		South African Council for Educators (SACE) publications
		Academic research on teacher development
		Training offered by professional bodies
	Status of training budget allocations by organisations for upskilling employees in digital and AI-related skills	Workplace skills plans submitted to the Department of Labour
		Reports from Sector Education and Training Authorities (SETAs)
		Department of Higher Education and Training (DHET) publications
		Industry research
		Academic studies
	Status of growth in workforce with Al skills	OECD.Al Policy Observatory

Background and motivation

Building human capacity and preparing for labour market transformation is one of the five recommendations made by the OECD Council on Artificial Intelligence.³³ Governments ought to collaborate with stakeholders to prepare for the transformative impact of AI (and related technological developments) on the world of work and society in general. Appropriate skills development and training programmes throughout working life are highlighted as key requirements.

Al is expected to have significant implications for all levels of education, from primary education through post-school education and the continuing education of the workforce.³⁴ It will drive both the demand for and supply of education: changing job requirements will drive the demand, while new opportunities provided by Al will introduce new ways of delivering education.

The World Economic Forum's 2025 Future of Work Report³⁵ identifies advancements in technology (Al in particular) as the most dominant of three transformative global trends (alongside robotics and automation, and energy generation, storage, and distribution) that are expected to drive both the fastest growing and fastest declining roles. These developments accelerate the requirements for developing relevant digital and/or technological skills. The World Economic Forum (WEF) 2025 report identifies technology-related skills (including Al and big data), networks and cybersecurity, and technological literacy as the top three fastest-growing skills.

It is worth noting that upskilling the workforce has been identified by the majority of employers surveyed by the WEF in 2025 as the most common workforce strategy across geographies and economies at all income levels in response to these transformative changes.³⁶

Including digital skills (STEM skills in particular) in an Al maturity assessment framework is thus imperative. For the purpose of the framework, the concept of digital skills will be used as the broader or foundational competency required for engaging with Al technologies across sectors.³⁷ Focusing on digital skills is particularly important for addressing the digital divide and ensuring inclusive growth, as highlighted in various national and international reports (Global Index on Responsible AI, 2023; Stanford HAI, 2024).

Countries prioritising digital skills within their AI strategies, such as the UAE and Rwanda, have demonstrated substantial progress in their AI maturity. For instance, the UAE's National Strategy for Artificial Intelligence 2031 emphasises developing digital skills to foster innovation and improve government services.³⁸ Similarly, Rwanda's AI Readiness and Maturity Assessment Framework highlights the importance of 21st-century skills and high AI literacy as key components of national AI readiness.³⁹

In South Africa, priority has been given to the development of digital and future skills as reflected in the National Digital and Future Skills Strategy gazetted in 2020,⁴⁰ and the national strategy in support of economic recovery.⁴¹ These publications recognise that, by equipping learners, students, and the workforce with the required digital and 21st-century competencies, the country can drive economic growth, increase productivity, and create new job opportunities in emerging sectors.

Digital skills encompass a wide range of competencies, from basic proficiency to advanced and highly specialised expertise.⁴² Given the importance of inclusive and equitable Al adoption, this maturity assessment framework acknowledges the need to address digital competence across the full spectrum, from basic digital literacy to highly advanced proficiency.

Although this domain of AI MAF is predominantly focused on AI skills, it is critical to acknowledge that these need to be complemented with other skills, such as creative thinking, resilience, flexibility, agility, and a mindset of lifelong learning.⁴³



This domain evaluates a country's capacity to conduct AI research, generate intellectual property, and foster innovation ecosystems that contribute to economic and societal development.

The AI MAF measures research and innovation capabilities by assessing the status of AI research facilities, the volume and impact of national AI research output, the extent of AI-related intellectual property (IP) generation and commercialisation, government support for AI research, the level of national and international research collaborations, the extent to which AI research is inclusive of local languages, cultures and societal needs, and the status of AI-related investment treaties.

The domain relies on multiple data sources, including Scopus, Web of Science, IEEE Xplore, national research councils, GDP data from national statistics agencies, and international benchmarking reports such as those by the OECD and UNESCO (see Table 5).

Table 5: Innovation and Research: sub-domains, indicators, and data sources

Sub-domains	Indicators	Data sources
Al research capability	Status of AI research facilities	Centre for AI Research (CAIR)
		Artificial Intelligence Institute of South Africa (AIISA)
	Status of national AI R&D outputs (i.e. academic publications, research reports) relative to overall national research output	National research databases and repositories, including publications indexed in Scopus, Web of Science, and IEEE Xplore
		Reports from national research councils and institutions
		GDP data from national statistics agencies and international benchmarking reports (e.g., OECD, UNESCO)
Generation and commercialisation of Al intellectual property	Status of local AI intellectual property creation through R&D	Companies and Intellectual Property Commission (CIPC)
		World Intellectual Property Organization (WIPO)
Government support and funding for Al research	Status of government investment and initiatives supporting AI research and innovation	Government budget reports and allocations
		Grant records from NRF, MRC, SARCHI
		Reports by science and technology departments
		Information from public research institutions
		Funding databases
		Annual reports

Sub-domains	Indicators	Data sources
Collaborations and partnerships in AI research	Status of R&D project collaborations between SA government/the SA industry and international organisations	Government databases
		Industry association reports
		International research programmes, i.e. Al Africa Consortium, The Artificial Intelligence for Development (AI4D) program, European-South African Science and Technology Advancement Programme (ESASTAP)
		African Research Universities Alliance (ARUA)
		Industry research
		Academic studies.
Inclusivity and contextualisation	Status of the extent to which AI research addresses local languages, cultures and	Department of Higher Education and Training (DHET) publications
in Al research	societal needs	Industry research
		Academic studies
Investment treaties	Status of Al-related investment treaties	Department of Trade, Industry and Competition (DTIC)
		African Union Development Agency – New Partnership for Africa's Development (AUDA- NEPAD)
		International investment organisations
		National economic forums

Background and motivation

Al research and innovation are crucial to national competitiveness in the digital economy. The ability to develop, adapt, and commercialise Al-driven solutions can enhance productivity, drive new business models, and create knowledge-intensive employment opportunities. Countries prioritising Al research within their innovation ecosystems – such as the United States, China, and Canada, and emerging Al hubs like Rwanda, Kenya, and Mauritius – demonstrate higher Al research output, greater investment in Al-driven startups, and stronger international collaboration in Al development. 44,45,46,47,48

Internationally, structured funding mechanisms, Al-specific R&D policies, and technology transfer programmes bolster Al research and innovation ecosystems. Countries like the United Kingdom and Singapore have established dedicated Al research funds, ensuring sustained investment in Al-related knowledge production.⁴⁹

The Presidential Commission on the Fourth Industrial Revolution⁵⁰ and the Department of Science, Technology and Innovation's (DSTI)⁵¹ White Paper on Science, Technology and Innovation⁵² underscore the role of AI research in driving South Africa's economic growth and technological transformation.



This domain evaluates a country's ability to foster a thriving Al ecosystem, ensuring that Al-driven businesses, startups, and multinational firms contribute to economic growth and technological transformation. A strong Al ecosystem is critical to economic diversification, global competitiveness, and job creation.

The AI MAF measures the development of the AI ecosystem through various subdomains, including the status of AI-focused startups and enterprises, the volume of AI-related investments, government support for AI-driven businesses, AI-related job creation, and the extent of AI adoption across industries. In addition, the framework assesses the presence of AI-focused trade policies, intellectual property (IP) protections, and the role of AI in key economic sectors.

Data sources for this domain include government reports, national and international business databases, Al investment tracking platforms, and labour market studies (i.e. OECD⁵³ and UNESCO⁵⁴ reports) (see Table 6).

Table 6: Growth of the AI Ecosystem: sub-domains, indicators, and data sources

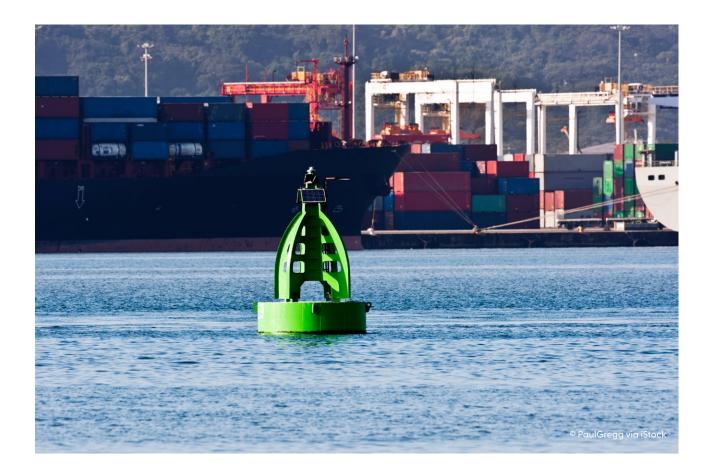
Sub-domains	Indicators	Data sources
Innovation hubs	Status of Al innovation hubs and enabling ecosystems	Artificial Intelligence Institute of South Africa (AIISA) reports
		Central University of Technology (CUT) AI Hub data
		Google's Al First Accelerator for Africa reports
		National AI Government Summit Discussion Document
		Centre for AI Research (CAIR) publications
		Industry reports from ITWeb, Statista and GSMA
	Status of collaboration and communication between Al innovation hubs and key stakeholders, such as government, universities, and industry	AIISA reports
		Google for startups: Accelerator – Al First, Africa
		National AI Government Summit Discussion Document
		CAIR publications
		Industry reports from ITWeb, Statista and GSMA
Startup support	Status of support for AI startups and growth of AI-related businesses (i.e. incubators, accelerators)	Government AI Readiness Index
		AIISA reports
		Google for startups: Accelerator – Al First, Africa
		National AI Government Summit Discussion Document
		CAIR publications
		Industry reports from ITWeb, Statista and GSMA
	Status of Al-related startups and businesses	Government AI Readiness Index
		AIISA reports
		Google for startups: Accelerator – Al First, Africa
		National AI Government Summit Discussion Document
		CAIR publications
		Industry reports from ITWeb, Statista and GSMA

Sub-domains	Indicators	Data sources
Ecosystem growth	Status of AI ecosystem growth	Government Al Readiness Index
		AIISA reports
		Google for startups: Accelerator – Al First, Africa
		National AI Government Summit Discussion Document
		CAIR publications
		Industry reports from ITWeb, Statista and GSMA
	Status of Al adoption by established companies across industry actors	Government AI Readiness Index
		AIISA reports
		Google for startups: Accelerator – Al First, Africa
		National AI Government Summit Discussion Document
		CAIR publications
		Industry reports from ITWeb, Statista and GSMA
Al investment and funding	Status of overall AI investment growth (including international and local investment)	Organisation for Economic Co-operation and Development (OECD)
		World Bank Group DataBank
		Southern African Venture Capital and Private Equity Association (SAVCA)
		African Private Capital Association (APCA)
		Statista
	Status of local Al investment growth	Southern African Venture Capital and Private Equity Association (SAVCA)
		African Private Capital Association (APCA)
		Statista
	Status of local Al knowledge creation through R&D	Companies and Intellectual Property Commission (CIPC) (a member of the DTIC group)
		World Intellectual Property Organization (WIPO) Patentscope
	Status of venture funding activity with appetite for South African Al investments	Southern African Venture Capital and Private Equity Association (SAVCA)
		African Private Capital Association (APCA)
		Statista

Background and motivation

A robust AI ecosystem is a fundamental driver of economic progress in the Fourth Industrial Revolution (4IR). AI-driven enterprises enable innovation, productivity gains, and technological advancements across multiple sectors, including health care, finance, manufacturing, and public administration. Leading AI economies, such as the United States, China, and the United Kingdom, have established comprehensive strategies to stimulate AI ecosystem growth through investment incentives, AI-specific regulatory frameworks, and structured AI adoption programmes.^{55,56}

In Africa, countries such as Rwanda, Kenya, and Mauritius have actively promoted Al ecosystem growth through national Al policies, startup incubators, and investment-friendly regulations. Rwanda, for instance, has established Al research and innovation hubs, attracting Al-focused businesses and fostering private-sector collaboration.⁵⁷ Kenya has prioritised Al integration in its digital economy strategy, leading to a surge in Al-driven startups and investment in Al-related infrastructure.⁵⁸ Similarly, Mauritius has implemented Al policy frameworks aimed at enhancing Al-related entrepreneurship and foreign Al investments.⁵⁹



Domain 7: Data and Digital Infrastructure

This domain assesses the foundational elements necessary for AI development, including both data readiness and the supporting infrastructure.

Indicators for the domain include the extent of data availability and the availability of AI solutions, infrastructure, and infrastructure investment. Together, these factors determine a country's ability to develop and deploy AI solutions effectively, particularly in ensuring local relevance and mitigating biases in AI models.

The domain relies on multiple data sources, such as Open Data South Africa, Github, MTN API Marketplace, Public Library of Science (PLOS), IBM open Datasets, and SA Treasury (see Table 7).

Table 7: Data and Digital Infrastructure: sub-domains, indicators, and data sources

Sub-domains	Indicators	Data sources
Data availability	Status of government (open-access/open- source) and/or industry (open-access/open- source) datasets available for AI development	Open Data South Africa (OPENDATASA, OPENDATAFORAFRICA)
Al solutions	Status of Al-related government/industry	OpenML
availability	APIs providing structured access to datasets available for AI development	Kaggle
		Google Dataset Search
		Github
		Hugging Face
		MTN API Marketplace
	Status of locally developed AI applications	OpenML
	(specifically ML, LLMs, local languages)	Kaggle
		Google Dataset Search
		Github
		Hugging Face
		Public Library of Science (PLOS)
		Azure Open Datasets
		IBM Open Datasets
Infrastructure investment	Status of GDP expenditure on digital infrastructure	SA Treasury
	Status of GDP expenditure on Al-related initiatives (i.e. project, digital infrastructure)	SA Treasury
	Status of energy spending on Al-related initiatives (including infrastructure)	Government Energy Spending Tracker: Policy Database
	Status of spending on protection and safeguarding of Al-related initiatives (including infrastructure)	SA Treasury

Sub-domains	Indicators	Data sources
Infrastructure	Status of data centres nationally	Cloudscene
		Baxtel
	Status of high-performance computing clusters	Key high-performance computing clusters include:
		Centre for High Performance Computing (CHPC)
		National Integrated Cyberinfrastructure System (NICIS)
		SANReN (South African National Research Network)
		Square Kilometre Array (SKA) computing and data processing
		University-based HPC clusters
	Status of AI digital infrastructure	Network Readiness Index
	Status of total population with access to electricity	International Energy Agency data Stats SA data

Background and motivation

The advancement of AI is deeply connected to a country's investment in data accessibility and digital infrastructure. The availability of high-quality data is essential for the effective training and performance of AI solutions. Making data more available and improving its use is essential for countries to tackle societal, climate, and environment-related challenges, contributing to healthier, more prosperous and more sustainable societies. AI tools, like large language models (LLMs), rely on vast amounts of data to refine algorithms, mitigate bias, and accurately represent a country's population. However, in many African nations, including South Africa, the availability of such datasets remains limited, restricting the growth of locally developed AI applications.

Similarly, digital infrastructure and investment measured by GDP expenditure on Alrelated initiatives, high-performance computing clusters, and national data centres play a pivotal role in scaling Al adoption. Robust infrastructure, including reliable electricity access and sustainable energy spending on Al, is essential for ensuring the seamless operation of Al systems.⁶² Countries with insufficient infrastructure or insufficient security and protection thereof often face higher reliance on foreign Al solutions, leading to challenges such as limited localisation, potential biases, and increased costs. Addressing these gaps through strategic investments in digital infrastructure, open data policies, and high-performance computing will determine how Al can drive economic growth, enhance public services, and support equitable digital transformation.



This domain evaluates South Africa's ability to ensure Al-related security and privacy, focusing on cybersecurity threats, data protection, regulatory enforcement, adoption of international best practices, and resilience against Aldriven risks. A robust Al security and privacy framework is essential to maintain public trust, safeguard sensitive information, and prevent malicious Al-driven cyberthreats.

Indicators for this domain include the number of Al-related data breaches, the status of cybersecurity policies, adherence to global best practices, regulatory enforcement mechanisms, and Al risk management capacity.

Data sources include the Information Regulator, ITU Global Cybersecurity Index, AI Preparedness Index (IMF),⁶³ and the OECD's AI Security Reports⁶⁴ (see Table 8).

Table 8: Security and Privacy: sub-domains, indicators, and data sources

Sub-domains	Indicators	Data sources
Al data and security breaches	Status of Al-related data and security breaches, as well as national capability to	National Cybersecurity Policy Framework (NCPF)
	respond to data and security breaches	Cybersecurity Hub (Government's CSIRT, DCDT) Information Regulator
Adoption of best	Status of international best practice	Al Preparedness Index (AIPI) – IMF
practices		Global Index on Responsible Al 2024 (Safety, accuracy, and reliability sub-domain)
		ITU Global Cybersecurity Index

Background and motivation

The rapid adoption of AI presents both opportunities and challenges in security and privacy. While AI enhances cybersecurity capabilities – such as threat detection, anomaly detection, and automated responses to attacks – it also increases vulnerabilities. AI-driven cyberthreats, such as data poisoning, adversarial attacks, and privacy breaches, necessitate robust AI security governance.⁶⁵

Globally, leading AI economies such as the United States, China, and the European Union have implemented comprehensive AI security policies, regulatory frameworks, and technical cybersecurity standards. Countries such as Ghana, Kenya, Mauritius, Rwanda, and Egypt have received Tier 1 rankings in the ITU Global Cybersecurity Index, demonstrating their commitment to cybersecurity through strong regulatory measures and incident-response capabilities.⁶⁶

South Africa, while making progress, remains on Tier 2 on the ITU Global Cybersecurity Index, highlighting gaps in regulatory enforcement, Al-specific cybersecurity infrastructure, and risk management strategies. Despite existing privacy regulations such as the Protection of Personal Information Act (POPIA), data security breaches remain a growing concern, and Al-driven privacy risks require stronger governance and policy interventions.⁶⁷



Section 3

Development of the Al Maturity Assessment Instrument

This section:

- Outlines the structured development of the assessment instrument, which leverages the ISO 37004 maturity scale as its foundation;
- Provides a detailed explanation of the evidence-based rubric, designed to systematically measure maturity levels from undefined to optimising across eight key domains; and
- Offers guidance on the collection and evaluation of data to ensure reliable, consistent, and actionable insights for national Al maturity assessment.

3.1 Introduction

The assessment instrument (rubric) to measure the level of maturity of the eight domains included in the South African AI Maturity Assessment Framework (MAF) was adapted from the maturity measurement scale set out in ISO 37004. The rubric reflects the structured progression of the ISO standards, employing a maturity scale that ranges from Level 0 (No evidence) to Level 5 (Continual optimisation or improvement). It is grounded in the principle of evidence-based assessment, evaluating maturity through the lens of activities and inputs (Levels 1–2) that lead to measurable outcomes and impact (Levels 3–5).

The methodology outlined below expands on these principles to guide the construction and application of a comprehensive Al Maturity Assessment instrument.

3.2 ISO 37004 standard as a basis for rubric construction

The ISO 37004 standard provided a critical foundation for constructing this measurement rubric (assessment tool), particularly the governance effectiveness maturity scale as described in Table 9.

Table 9: Governance effectiveness maturity measurement scale with descriptions: valuation framework building blocks (ISO 37004, Table 4)

Level	Description
Level 0: Undefined	No evidence can be found of commitment to or application of the principle.
Level 1: Limited	Where evidence is available, it is limited to that of performing the minimum necessary to achieve the intent of the principle.
Level 2: Emerging	Evidence is available and managed.
Level 3: Formalised	Evidence is available, managed, and aggregated to form a cohesive system in which emergent behaviours can be observed.
Level 4: Measured	Evidence is available, managed, and aggregated, and it is measured or assessed.
Level 5: Optimising	Evidence is available, managed, aggregated and measured or assessed, and it is optimised for continual improvement.

The adaptation of the six maturity levels (ranging from 0 to 5) outlined in the ISO 37004 standard for the purposes of the AI Maturity Assessment Framework (AI MAF) is presented in Table 10.

Table 10: Adjustment of ISO 37004, Table 4, for application in the maturity measurement of the AI MAF

Level	Description
Level 0: Undefined	No evidence can be found of commitment to preparing an Al-supportive environment (readiness).
Level 0. Ondermed	Rubric wording: No evidence, no engagement, no or minimal presence (e.g., no Al leadership, no Al summits, no benchmarking).
	Where evidence is available, it is limited to performing the minimum necessary to indicate an intention to create an AI-supportive environment.
Level 1: Limited	Rubric wording: Some documented evidence of engagement, participation or minimal engagement (e.g., limited summits or isolated mentions of Al leadership, no active participation in global rankings). Evidence of limited/dispersed internet access; evidence of a PhD offering being planned or rolled out in the field of Al.
	Indications/evidence of (e.g., Al inclusion and readiness) are available, and associated action initiatives have been initiated/approved.
Level 2: Emerging	Rubric wording: Initial actions and evidence of national participation in [indicator], early-stage partnerships, and beginnings of benchmarking efforts, though still low-ranking or lacking full impact. Visible activity, but no clear, documented impact.
Level 3: Developing	Indications/evidence of (e.g., Al implementation and innovation initiatives) are available. They have been initiated/approved and aggregated with the progressing or completed Al inclusion and readiness initiatives to form a cohesive system in which emergent behaviours can be observed.
	Rubric wording: Evidence of participation in [indicator], involving [key stakeholders], [early benchmarking], and/or evidence of being 'mid-tier' in rankings relevant to this indicator. Initiatives in [indicator] are integrated and show early results, with documented impact.
	Indications/evidence of transformations are available. The [indicator] initiatives are progressing or completed, aggregated, and measured or assessed.
Level 4: Measured	Rubric wording: Al initiatives towards this [indicator] are being systematically tracked and assessed. There is evidence of these measurements' tracking. Regular engagement, active benchmarking, and efforts to improve standing, rankings, and impact exist. Initiatives in (R&D, partnerships, and governance structures) are in place and measured for effectiveness.
Level 5: Optimising	Indications/evidence of sustainable AI development are available. The AI inclusion, readiness, implementation, and innovation initiatives have been completed and embedded and form a sustainable AI development foundation in aggregation; the foundation is measured or assessed, and based on the results, the foundation is optimised for continual improvement.
	Rubric wording: National initiatives for this indicator are optimised for continual improvement, with targeted initiatives to raise standing, rankings, and impact. There is a continuous effort to enhance partnerships, engagement, and responsible Al practices, with ongoing optimisation based on evaluations and benchmarking against African and global peers.

- Maturity scaling: The structured progression from no evidence (Level 0) to continual optimisation (Level 5) mirrors the ISO standards, ensuring that the framework adheres to global best practices in Al governance and maturity measurement.
- Evidence-based assessment: The emphasis on evidence (Levels 0 to 2) and measurable outcomes at each level (Levels 3 to 5) aligns with the ISO requirement for data-driven governance and continuous assessment.
- Sources: Evidence and/or outcomes should be from reliable data sources, including government reports, academic studies, AI readiness indices (Stanford AI Index, Government AI Readiness Index), event platforms (Eventbrite), and reports from international bodies (OECD, UNESCO).

3.3 Methodology for conducting a national-level Al maturity measurement using the SA Al Maturity Assessment Framework Measurement Rubric

For the first assessment of the AI maturity level of South Africa nationally, the rubric was constructed using the ISO 37004 as a foundation. It includes the following steps:

1. Gather data.

Collect relevant data for each measurable indicator using the suggested data sources as the starting point. The emphasis is on data that describes evidence ('input', Levels 0–2) and/or measurable outcomes at each level ('output', Levels 3–5). Evidence and/or outcomes data (qualitative or quantitative) should be from reliable data sources, including government reports, academic studies, Al readiness indices (Stanford Al Index, Government Al Readiness Index), event platforms (Eventbrite), and reports from credible international bodies.

2. Assess each subdomain.

Review the indicator's descriptions for Levels 0–5 maturity in the Measurement Rubric.

3.
Assign
a level
based on
evidence/
indicators
available
in the data
collected.

As an example, during a review of the data related to the domain 2 (Enabling Regulatory Environment) indicator, "Status of a national AI governance body, and government departments and agencies addressing AI-related policy", the researcher found evidence of the existence of a national governing body, but limited evidence of regular output from this governing body. This would equate to Level 2 maturity on the rubric. For this example, the Level 2 indicator states:

Formation of a permanent national AI governance body. Metric: Number of permanent bodies established. Deemed met when: A permanent governance body is established. Criteria as stated in level 2 requires evidence of official documentation and operationalisation of the body.

4.
Provide
document
evidence.

In support of the allocated measurement score (0-5) for an indicator, notes or references supporting the assigned level should be provided (data sources, documentation process). Further elaboration on how the maturity level was selected may be added to the narrative chapters of the SA AI MAF.

For the above-mentioned example, the researchers offered the following summary of the evidence found and the subsequent scoring decision:

There is currently no specific national AI governance body. However, there are several government entities, with some level of coordination among themselves and private-sector stakeholders, shaping the development and use of technology, including AI, in South Africa. These entities include the DCDT, DSTI, DTIC, NACI, PC4IR (ad hoc body), AIISA and its University of Johannesburg (UJ) and Tshwane University of Technology (TUT) hubs, CAIR and its research groups, CSIR, HSRC, etc. This would equate to Level 2 maturity on the rubric.

3.4 Weighting

Weighted domain score calculation:

For each domain, an overall weighted score is calculated to reflect the AI maturity of the specific domain. The calculated value will range between zero and one, where one is a perfect score (high maturity) and zero indicates a lack of maturity.

As an example:

The allocated score per indicator for a specific domain is summed and divided by the maximum possible score for the specific domain (number of indicators times five). If a domain has two indicators, each with a score of 3, the weighted score will be calculated as the sum of the indicator scores (3+3) and divided by the number of indicators for the domain (2) multiplied by the maximum score for the indicator (5), thus (3+3)/(2*5)=0.6.

In visualising the outcome of the maturity, weighted scores per domain were applied (see Section 5).





Section 4

South Africa's first Al Maturity Assessment: Applying the Framework

This section:

- Presents the initial application of the Al MAF, providing a comprehensive baseline assessment of South Africa's maturity across each of the eight identified domains;
- Includes nuanced domain-specific evaluations based on carefully collected data, producing valuable insights and establishing the starting point for strategic improvements; and
- **Visualises the outcomes** through an interactive dashboard, facilitating ongoing updates and scalability.

4.1 Introduction

This section presents South Africa's national performance as measured by the Al Maturity Assessment Framework (Al MAF). Each indicator within the framework's domains is assessed and scored on a maturity scale ranging from Level 0 (no evidence) to Level 5 (optimisation or continual improvement). Scoring is based on an analysis of evidence drawn from a wide range of relevant data sources as presented in the domain tables in Section 2 (including government reports, academic studies, Al readiness indices, and publications from credible international bodies).

The section concludes with an overview of the data visualisation process, as well as the setup and training of an Al agent developed to support the Al maturity assessment.

4.2 Domain-specific measurements

The results of each indicator assessment are summarised in the domain assessment tables below, which present the assigned scores alongside the corresponding ISO-aligned descriptions. Each table is followed by a narrative that offers insights, highlights nuances, and provides contextual pointers to support interpretation of the measurement outcomes.



Table 11: Assessment of the International and Continental Profile as AI Leader domain

Sub-domains	Indicators	Measurements	
Recognition on global AI indices	Status of recognition for Al leadership, competitiveness and/or maturity of Al industry as evidenced in ranking in global Al indices	Documented evidence of presence on relevant indices. Evidence shows South Africa is 'low-tier' in relevant rankings, with limited initiatives.	2
	Status of benchmarking against peer countries such as the UAE, Kenya, Rwanda, India, and BRICS nations, as evidenced in ranking in global Al indices for Al leadership, competitiveness, and/or maturity	Documented presence of benchmarking indicators on indices, showing 'low-tier' ranking with limited national initiatives to improve.	2
Hosting and Participation Leadership Events	Status of Al leadership events hosted in South Africa (specifically national events, continental events, global events)	Documented evidence of emerging AI leadership events in South Africa, showing initial presence without documented impact.	2
	Status of participation of South African Al leaders in global and African forums and conferences, specifically in leadership roles	Evidence of South African leaders beginning to participate in global AI forums, but with limited influence, and with limited to no impact.	2
Responsible Al recognition	Status of recognition for responsible AI (ethical and sustainable AI practices) as evidenced in ranking in the Global Index on Responsible AI	Evidence of recognition for responsible AI in relevant indices.	1
Al best practice adoption	Status of adoption of (new) ISO AI- related standards	Minimal documented evidence of awareness or limited efforts by a few participants to adopt ISO AI standards.	1

Sub-domains	Indicators	Measurements	
Sustainable Al investment	Status of funding allocated to green AI R&D focused on energy-efficient AI algorithms, hardware, and infrastructure.	Few or isolated green AI R&D funding initiatives exist, with limited regulatory support for and incentivisation of local AI adoption.	1
Sustainable Al procurement	Status of government Al procurement policies and initiatives supporting responsible Al (ethical and sustainable	Initial identification of the need for sustainable AI procurement guidelines or regulations or laws.	
	AI), including environmental impact assessments	Metric: Evidence of consultations on sustainable Al procurement guidelines or regulations or laws.	1
		Deemed met when: Consultations are held to discuss sustainable Al procurement guidelines or regulations or laws at national level.	
	Status of green (sustainable) Al guidelines that promote the	Initial identification of the need for green Al guidelines or regulations or laws.	
	development of energy-efficient Al models and the use of renewable energy sources in Al infrastructure	Metric: Evidence of consultations on green Al guidelines or regulations or laws.	1
		Deemed met when: Consultations are held to discuss green Al guidelines or regulations or laws at national level.	

An expanded assessment of each indicator within the sub-domains is provided below.

Recognition on global AI Indices

 Status of recognition of AI leadership, competitiveness and/or maturity of AI industry as evidenced in ranking in global AI indices (Score: 2)

As of November 2024, South Africa is acknowledged in multiple global AI indices. In the 2024 Government AI Readiness Index, the country obtained an overall maturity measurement of 52.91, which positions it within the lower-middle-tier spectrum. Countries that demonstrate the highest levels of AI maturity are the USA with a score of 87.03, Singapore with 84.25, UK with 78.88, and the Republic of Korea with 79.98. South Africa's current initiatives in AI are limited, lacking the comprehensive national strategies and substantial investments observed in higher-ranked nations. 68,69

 Status of benchmarking against peer countries such as Kenya, Rwanda, India, and BRICS nations, as evidenced in ranking in global Al indices for Al leadership, competitiveness, and/or maturity (Score: 2)

In comparison to some African countries, South Africa (52.91) trails behind the African leader, Mauritius (53.94) in the 2024 Government AI Readiness Index, but is measured to be slightly more mature than Rwanda (51.25), Senegal (48.11), and Kenya (43.56). Compared to BRICS countries, South Africa performs less favourably with China (72), Brazil (65.89), Russia (64.72), and India (62.81). This assessment reflects the need for more robust national initiatives and strategic investments to improve the country's global AI standing.⁷⁰

Hosting and participation in leadership events

 Status of Al leadership events hosted in South Africa (specifically national events, continental events, global events) (Score: 2)

In recent years, South Africa has hosted several notable AI leadership events, such as the AI Expo Africa, The SingularityU South Africa Summit, and Leaderex. The AI Expo Africa⁷¹ is recognised as Africa's largest business-to-business (B2B) AI event. It attracts over 1,700 delegates and 60+ speakers annually. The 2024 edition featured eight continuous professional development (CPD)-certified AI skills workshops and showcased 10 local AI startups. The SingularityU South Africa Summit⁷² brings together innovation experts to discuss topics like AI and blockchain convergence, food science, and democratised AI. The 2024 summit, held in collaboration with Old Mutual, expected over 1,500 delegates. Leaderex⁷³ is South Africa's largest gathering of business leaders, professionals, and entrepreneurs. It includes discussions on AI, data science, and digital transformation. The latest event was held at the Sandton Convention Centre in September 2024.

 Status of participation of South African Al leaders in global and African forums and conferences, specifically in leadership roles (Score: 2)

South African AI leaders have demonstrated active participation in international AI forums and conferences, with instances of speaking engagements and leadership roles. South Africa's involvement in the Global Inclusivity and Artificial Intelligence: Africa (GIAA) Conference⁷⁴ in Lagos, Nigeria in September 2024 showcased the country's commitment to AI leadership on the continent. The conference convened over 370 participants, including South African government officials, industry leaders, and academics, to discuss AI development and deployment across Africa.^{75,76,77}

Responsible AI recognition

 Status of recognition for responsible AI (ethical and sustainable AI practices) as evidenced in ranking in The Global Index on Responsible AI (Score: 1)

South Africa's classification at Level 1 (Limited) in responsible AI recognition is based on its position in the Global Index on Responsible AI,⁷⁸ where it ranks 68th out of 138 countries. This ranking places South Africa in the lower-middle tier globally, indicating that, while there is some evidence of recognition for responsible AI practices, these efforts are not yet fully developed or strategically implemented. The country's current initiatives in ethical and sustainable AI are limited, lacking the comprehensive national strategies and substantial investments observed in higher-ranked nations.⁷⁹

Al best practice adoption

Status of adoption of (new) ISO Al-related standards (Score: 1)

According to the latest available data, South Africa exhibits minimal documented evidence of awareness, or limited efforts by a few participants to adopt ISO AI standards. While there is recognition of the importance of AI standards, comprehensive adoption across sectors remains limited.⁸⁰

Sustainable Al investment

 Status of funding allocated to green AI R&D focused on energy-efficient AI algorithms, hardware, and infrastructure (Score: 1)

According to the latest available data, South Africa exhibits few or isolated green AI R&D initiatives, with limited regulatory support and incentivisation for local AI adoption. While there are some efforts to promote sustainable AI practices, comprehensive funding and structured frameworks are lacking 81,82

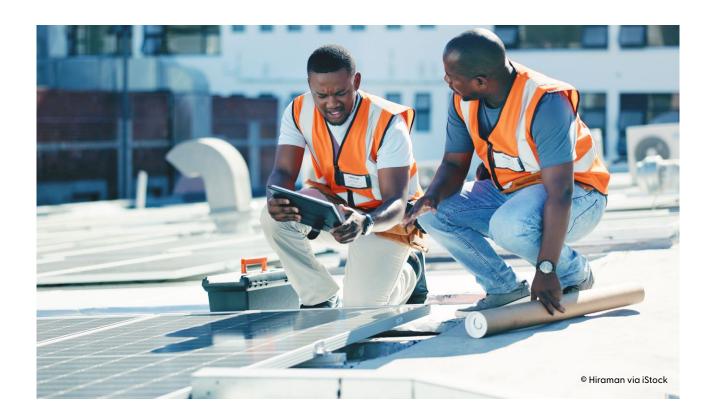
Sustainable AI procurement

 Status of government AI procurement policies and initiatives supporting responsible AI (ethical and sustainable AI), including environmental impact assessments (Score: 1)

The latest available data indicate that South Africa has identified the need for sustainable AI procurement guidelines, regulations, or laws. There is evidence of consultations at the national level to discuss such guidelines, indicating initial steps toward formalising sustainable AI procurement practices.^{83,84}

 Status of green (sustainable) Al guidelines that promote the development of energy-efficient Al models and the use of renewable energy sources in Al infrastructure (Score: 1)

South Africa has identified the need for green Al guidelines, regulations, or laws. There is evidence of consultations at the national level to discuss such guidelines, indicating initial steps toward formalising green Al practices.⁸⁵





Considerations for advancing the maturity level of the country's international and continental profile as an Al leader

Overall, the current maturity level on this domain can be described as Limited. The score for the various indicators ranges from 1 to 2. South Africa currently exhibits a low profile in international Al indices and relatively limited involvement in global and African Al forums. Although some national Al events are organised, they lack international influence and coordinated follow-through.

To move beyond this foundational phase and accelerate progress, the following strategic considerations are proposed:

Develop integrated international engagement strategy: Develop a coordinated and integrated international AI engagement strategy to inform South Africa's engagement in global AI forums to demonstrate commitment towards its global and continental AI leadership role.

Advance responsible Al leadership: Align Al regulations with global developments such as the OECD Al Principles to safeguard human rights, privacy, and social well-being.

Promote sustainable AI practices: Develop AI sustainability guidelines aligned with the National Development Plan 2030 and carbon reduction goals, mandating energy-efficient models and renewable energy use. AI initiatives, both in the public and private sector, must undergo environmental impact assessments to meet national and global sustainability standards.

Strengthen green AI research and development: Public and private investment should support energy-efficient AI models and eco-friendly infrastructure, leveraging institutions such as the CSIR, universities, and other research institutions that are involved in green-related research. International best practices, particularly in agriculture, energy, and mining, should be adopted to reduce environmental impact. The Global Partnership on Artificial Intelligence could potentially provide insights into and/or guidance on advancements in this respect.⁸⁶

Establish sustainable AI procurement and investment policies: Government procurement processes should prioritise low-carbon AI solutions, with sustainability criteria embedded in public tenders and contracts. Incentives such as tax benefits and grants should support organisations to reduce energy and water usage and emissions through AI.



Table 12: Assessment of the Enabling Regulatory Environment domain

Sub-domains	Indicators	Measurements	
Strategic planning performed	Status of a national broad-based Al strategic and/or policy framework, and other sectoral, supportive, and enabling policies (such as data, digital, cloud, and cybersecurity, etc.)	Drafting and consultations on the Al strategy and/or policy framework Metric: Status of draft strategy Deemed met when: At least one draft and consultation process is completed.	2
Governance structures implemented	Status of a national AI governance body, and government departments and agencies addressing AI-related policy	Establishment of a temporary or interim governance body. Metric: Existence of interim body (bodies) formed. Deemed met when: At least one interim body is formed with the aim of creating a governance body.	2
Regulatory frameworks formulated and enacted	Status of AI-specific regulation and the number of AI-related laws enacted	Existence of Al-related laws/regulations, and initial identification of the need for Al-specific regulation Metric: Evidence of consultations on Alspecific regulation Deemed met when: Consultations are held to discuss Al-specific regulatory needs at the national level.	1
Codes of conduct implemented	Status of government-developed code(s) of conduct to guide ethical and trustworthy Al adoption across institutions	Drafting of a government-developed AI code of conduct or similar (or work towards such a document) Metric: Draft document, or any evidence of work towards Deemed met when: A draft code of conduct is created for consultation at the national level.	2
Parliamentary oversight of AI (policy, regulation, and enforcement)	Status of a parliamentary committee performing oversight of departments and agencies responsible for Al-related policy, regulation, and enforcement	Parliamentary committee reviews and makes amendments to AI policies and regulations Metric: Evidence of revisions and recommendations made by the oversight committee Deemed met when: Regular revisions are made by the oversight committee.	3
Compliance	Status of AI policy alignment and regulation compliance mechanisms/ frameworks, including responsible AI, by participants in the ecosystem	Emerging compliance with national AI regulations and compliance with national AI strategies.	2
Trained public servants (civil servants, the judiciary, policy makers, and regulators)	Evidence of training of public servants/ regulators/policy makers in AI-related competencies	Initial discussions or plans to train public servants in Al Metric: Evidence of plans to train public servants in Al-related skills Deemed met when: There is evidence of at least one plan to conduct Al-related training documented at the national level.	1

An expanded assessment of each indicator within the sub-domains is provided below.

Strategic planning undertaken

 Status of a national broad-based AI strategic and/or policy framework, and other sectoral, supportive and enabling policies (such as data, digital, cloud and cybersecurity, etc.) (Score: 2)

As at June 2025, there is no national Al strategy, however plans are well underway to develop this. Two initiatives – a project driven by the National Advisory Council on Innovation (NACI), CSIR, and Human Sciences Research Council (HSRC), overseen by the DSTI, and the ongoing work of DCDT – are currently in process towards the development of a national AI strategy. In 2023, the DCDT released a discussion document on AI, which draws from the existing ICT and 4IR policies.⁸⁷ The DCDT further recently published the national framework, setting the bedrock for a national Al policy for public comments.⁸⁸ The NACI-led work is also currently seeking input from the public. Even so, Al is embraced within the context of the existing digital policies and the broader policy focus on the 4IR. The relevant digital policies include the PC4IR report, 89 National Information Society Development Plan 2007, National Integrated ICT Policy White Paper 2016,90 White Paper on Science, Technology, and Innovation 2019,91 ICT and Digital Economy Master Plan for South Africa 2020, and National Policy on National Data and Cloud 2024.92 At the provincial level, the Western Cape province recently published its Guardrails/ Policy for the adoption of Al in its Department of Infrastructure.⁹³

Governance structures implemented

 Status of a national AI governance body, and government departments and agencies addressing AI-related policy (Score: 2)

There is currently no specifically mandated national Al governance or oversight body in South Africa. However, there are several government entities, with some level of coordination among themselves and private-sector stakeholders, shaping the development and use of technology, including Al. These entities include the Department of Communication and Digital Technologies (DCDT), the Department of Science, Technology and Innovation (DSTI), the Department of Trade, Industry and Competition (DTIC), the National Advisory Council on Innovation (NACI), the Presidential Commission on the Fourth Industrial Revolution (PC4IR, ad hoc body), the Artificial Intelligence Institute of South Africa (AIISA) and its UJ and TUT hubs, the Centre for Artificial Intelligence Research (CAIR) and its research groups, the Council for Scientific and Industrial Research (CSIR) and the Human Sciences Research Council (HSRC).

Regulatory frameworks formulated and enacted

• Status of Al-specific regulation and number of Al-related laws enacted (Score: 1)

There is currently no Al-specific regulation regime in South Africa. However, a survey of public databases reveals the existence of regulations within foundational legal building blocks that are adaptable to address some emerging gaps and challenges relating to the development and adoption of Al in South Africa. Although the regulations were enacted in the past to address specific sectors, their potential applicability within the Al context is informed by the implications of the adoption of Al for cross-cutting issues such as data governance (privacy, security, access, management, protection, etc.), human rights, consumer protection, health and well-being, intellectual property, climate change, cybersecurity, corporate governance, e-commerce, digital communication, digital finance, future of work and employment, and competition.⁹⁴

Codes of conduct implemented

 Status of government-developed code(s) of conduct to guide ethical and trustworthy Al adoption across institutions (Score: 2)

There is currently no single, national Al-specific code of conduct for use, development or deployment of AI in South Africa. Instead, there is a relatively dispersed digital policy landscape that embraces Al. The DCDT, DTIC, and the DSTI have adopted digital policies that can lead to the development of codes of conduct for the ethical adoption of Al. Specifically, the 2019 White Paper on Science, Technology and Innovation⁹⁵ evinces a strong governmental interest in Al, especially concerning the mitigation of the risks of (gender) biases perpetuated by Al, and inter-departmental cooperation for strategies that will guide ethical Al development and adoption. In addition, there are an increasing number of specific institutional guidelines for the ethical adoption of AI, especially in the areas of corporate governance, and higher education and research. The guidelines are attempts to adapt principles embedded in the Bill of Rights in the Constitution of the Republic of South Africa 1996, as well as the rules enacted in legislation such as the Protection of Personal Information Act 4 of 2013 (POPIA), the Companies Act 78 of 2008, and existing intellectual property statutes, to address the ethical issues relating to AI in the sectors. At the provincial level, the Western Cape Province published its Guardrails/Policy for the adoption of AI in its Department of Infrastructure in 2024.

Parliamentary oversight of AI

 Status of a parliamentary committee performing oversight of departments and agencies responsible for Al-related policy, regulation and enforcement (Score: 3)

The DCDT, DSTI and, to some limited extent, the DTIC are the departments driving AI policy and governance in South Africa. These departments, including the agencies under them, fall under the oversight of the National Assembly Portfolio Committees on Communications and Digital Technologies; Science, Technology and Innovation; Trade, Industry and Competition; and the NCOP Select Committee on Education, Sciences and Creative Industries.

Compliance

 Status of AI policy alignment and regulation compliance mechanisms/ frameworks, including responsible AI, by participants in the ecosystem (Score: 2)

There is currently no Al-specific policy and regulation regime in South Africa. However, Al-related policies (data, cloud, ICT, etc.) and foundational laws exist. Even so, there appears to be a lack of evidence for the extent of compliance with Al-related policies and laws. Nonetheless, there are indications of the application of existing Al-related regulations to Al-enabled ventures in South Africa. For instance, companies now use AI technology for personal data processing, thus raising the need to comply with POPIA. POPIA protects personal data and, for this purpose, establishes the Information Regulator as an independent body subject to the Constitution. Although enacted before the 'Al boom', when the law is revised to align with the new reality the Information Regulator can adapt POPIA to ensure compliance, especially since it addresses automated decision-making in South Africa. In the area of competition, the Competition Commission is now turning its attention to how global platforms, such as Google, Meta, TikTok and ChatGPT, are deploying their data power and using algorithms, especially in the media and digital platform market, to affect consumer welfare and restrict local enterprises' capacity to compete. Also, in 2023, the Commission released a report of its findings from its Online Intermediation Platforms Market Inquiry. Concerning intellectual property, the Companies and Intellectual Property Commission (CIPC) has since 2018 received over 1 000 Al-related patent applications. In 2021, the CIPC granted patents in respect of two applications that named an Al system (DABUS) as the inventor.

Trained public servants

 Status of evidence of training of public servants/regulators/policy makers in Alrelated competencies (Score: 1)

Both the PC4IR report and the National AI Plan recognise the training and upskilling of South Africa's workforce, especially in the public sector, as important drivers of ethical and responsible AI adoption in the country. To this end, the government has indicated plans to mainstream AI training and skills development into TVET programmes and to take advantage of certification programmes provided by organisations such as NEMISA. For public sector training in particular, AI-related training programmes should be included in the courses offered by PSETA and the National School of Government (NSG), which are institutions established for the training of different levels of public servants in South Africa.



Considerations for advancing the maturity level of the country's regulatory environment

Overall, the current maturity level for this domain can be described as Emerging, with scores ranging from 1 to 3 on the various indicators. While different departments are involved in Al-related initiatives, there is no unified Al governance structure in South Africa. Currently, efforts are fragmented, and comprehensive regulation is lacking.

To accelerate progress within this domain, the following strategic considerations are proposed:

Establish and capacitate national AI governance structures: Support interregulator information sharing and capacity exchanges/sourcing to address AI (including with international peers); and initiate consultations with existing regulatory oversight bodies to determine the structure, scope, etc. of a national AI governance body; establish a national AI governance body.

Implement a cohesive national AI policy and implementation framework: Develop and adopt a robust national AI strategy or policy with input from a variety of stakeholders across industry, the public sector, academia and civil society groups; review/update the strategy annually; align future AI initiatives with the strategy.

Strengthen empowerment of regulators and civil servants through training on Al policy: Develop specific Al training programmes for civil servants, the judiciary, policymakers and regulators; ensure regular training and upskilling in emerging Al fields as a KPI to enhance understanding of the subject matter, and cognisant governance and policymaking for the sector.

Formulate sector-specific ethical Al codes of conduct: Develop industry-driven national Al code of conduct or charter to guide stakeholders in complying with Al-related regulations; ensure alignment with international Al ethical and safety standards; regularly review the code of conduct to address emerging Al issues.

Establish adaptive and forward-looking AI regulatory frameworks: Identify gaps in current regulations; draft and enact AI-specific laws or amend existing AI-related laws to address issues pertaining to AI as an emerging technology; periodically review and update laws to remain relevant in AI governance.

Enhance parliamentary oversight for AI governance: Expand the mandate of the existing portfolio committee on digital communication and technology to include regular AI policy reviews. Enhance support for the committee through awareness and training on emerging AI applications and ethical considerations.

Build enforcement capacity: Build capacity for enforcement in ministries and private sector stakeholders in priority areas (e.g. data privacy, disinformation) and identify higher risk issues that need monitoring and enforcement capacity development. Continue the regular monitoring of adherence to national and international Al policies.



Citizen Engagement With and Empowerment Through Al

Table 13: Assessment of the Citizen Engagement With and Empowerment Through Al domain

Sub-domains	Indicators	Measurements	
Public perception of AI	Status of mechanism(s) to assess public awareness of AI	Evidence of emerging efforts to systematically track public understanding of AI and its potential impact, with initial data collection and regional-level reporting.	1
	Status of mechanism(s) to assess public attitudes towards Al	Evidence of initial discussions or limited, isolated efforts to understand public attitudes toward AI, and low ranking on relevant indices.	1
Public engagements	Status of government-led AI-related public engagement events (i.e. conferences, seminars, workshops, and campaigns)	Evidence of very limited public engagements, events, conferences, or workshops about Al.	1
Access and inclusion	Status of growth in total population that uses the internet (households or individuals)	Measurable evidence of increasing internet usage among the population, with visible progress in national connectivity.	3
	Status of gender parity in internet usage	Measurable evidence available for the gender gap in internet usage is systematically tracked and assessed for impact, with targeted initiatives in place.	4
	Status of rural/urban parity in internet usage	Measurable evidence of decreasing rural-urban gap in internet usage, with visible improvements in access for rural populations.	3
	Status of SA mobile data affordability as measured on the global mobile affordability cost ranking	Measurable evidence of a below global average affordability ranking, with mobile data costs remaining relatively high.	2

An expanded assessment of each indicator within the sub-domains is provided below.

Public perception of AI

Status of mechanism(s) to assess public awareness of AI (Score: 1)

The IPSOS 2024% AI Monitor, covering 32 countries, provides some insights into South Africans' awareness of AI, revealing that 61% of the population expresses excitement about AI. However, its online methodology skews the sample towards urban respondents, underrepresenting rural perspectives. Similarly, the Google-Ipsos study, *Our Life With AI*,97 highlights optimism about AI's potential in health and education, although concerns over job displacement remain. Despite these international insights, South Africa lacks a dedicated mechanism to systematically track public awareness of AI, a gap that the HSRC's South African Social Attitudes Survey (SASAS)98 could potentially fill.99

Status of mechanism(s) to assess public attitudes towards AI (Score: 1)

As mentioned previously, the IPSOS 2024 AI Monitor and Google-Ipsos provide valuable insights into global public perceptions and trust in AI, highlighting regional differences in attitudes, concerns, and expectations regarding AI development and governance. While South Africa participates in these international studies, as of the latest available data, the country does not have a national framework or initiative for systematically measuring public attitudes and sentiment toward AI. Isolated efforts to gauge public perceptions are typically very localised.

Public engagement

 Status of government-led Al-related public engagement events (i.e. conferences, seminars, workshops, and campaigns) (Score: 1)

The latest available data do not offer evidence of structured government-led engagements with the South African public on the topic of Al. However, the national Al policy framework was released towards the end of 2024 for public comment.¹⁰⁰

Access and inclusion

 Status of growth in total population who use the internet (households or individuals) (Score: 3)

There has been a continuous increase in internet usage among South African citizens, propelled by the COVID-19 pandemic: internet usage increased from 49% of the population in 2018 to 76% in 2022. ¹⁰¹ Internet usage is tracked intermittently at the individual level (e.g., by Research ICT Africa¹⁰² and ITU¹⁰³) and household level on an annual basis (Stats SA general household surveys¹⁰⁴). Despite notable progress, the considerable percentage of South African internet users masks high intersectional inequality in access and usage.

• Status of gender parity in internet usage (Score: 4)

The gender disparity in internet usage narrowed between 2012 and 2022, from 8% to being negligible. However, among those aged over 60, a 53% gender gap persists, posing a barrier to digitised government services like pensions and social grants. If unaddressed, older women may face disproportionate disadvantages in accessing these essential services.

Status of rural/urban parity in internet usage (Score: 3)

The urban-rural disparity has decreased steadily over recent years, with notable efforts to increase internet access in rural areas. However, the gap remains significant, standing at 20% in 2022.¹⁰⁶

 Status of SA mobile data affordability as measured on the global mobile data affordability ranking (Score: 2)

The high cost of mobile data is one of the leading barriers to internet use in South Africa.¹⁰⁷ While mandatory price reductions have offered some relief, inflation, load shedding, and infrastructure challenges continue to strain operators' ability to lower prices further. In addition, affordability concerns persist due to widespread income disparities and reliance on smaller data bundles, which carry higher per-GB costs. According to the GSMA Mobile Connectivity Index,¹⁰⁸ South Africa scores 58.6 out of 100 for affordability (with higher scores indicating higher mobile data costs and poorer affordability), and ITU affordability statistics indicate that the cost of the country's data-only mobile broadband basket (2GB) is slightly above the global average.¹⁰⁹



Considerations for advancing the maturity level of citizen engagement with and empowerment through AI

Overall, the current maturity level for this domain can be described as Emerging. The scores for the various indicators range from 1 to 4. Public awareness and trust in AI are still low, particularly among marginalised groups. Persistent challenges with internet accessibility and affordability continue to constrain broad-based public participation. However, notable progress has been made in narrowing internet usage gaps, especially gender-related ones.

To accelerate progress within this domain, the following strategic considerations are proposed:

Conduct regular national surveys to gauge AI awareness and trust: Implement inclusive, national-level assessments of AI awareness and public sentiment using mixed-methods data collection (e.g., in-person, telephonic, and digital methods), particularly prioritising rural and underserved areas. Existing tools such as SASAS can be leveraged to monitor evolving public AI-related perceptions and inform adaptive, evidence-based policymaking.

Develop digital skills: Strengthen digital and AI literacy programmes by leveraging government initiatives, universities, tech hubs, media (radio, TV, print), and community groups. Programmes should promote not only practical use but also critical thinking, dialogue, and hands-on learning, especially in rural and remote areas.

Host structured public engagement events on Al across provinces: Promote public engagement on Al and other emerging technology-related topics through a structured consultation framework (e.g., policy forums, hackathons, citizen panels) with regular reporting on engagement metrics.





Table 14: Assessment of the Education and Workforce Development domain

Sub-domains	Indicators	Measurements	
Education and training	Status of digital literacy proficiency among the general population	Evidence of coordinated efforts to promote digital literacy, with programmes targeting specific segments of the population and some measurable outcomes.	2
	Status of integration of Al-related topics in the education curriculum (at Grade 7 and Grade 12 levels)	Evidence of initial efforts to integrate Al-related topics into specific subjects, with pilot programmes or supplementary materials provided to selected schools.	2
	Status of students matriculating with STEM subjects	Evidence of systematic efforts to track STEM subject matriculation rates, with emerging trends documented at local or regional levels.	2
	Status of Al vocational training and certification programmes available nationally	Evidence of isolated or ad hoc Al training programmes, with limited reach and no formal certification processes in place.	1
	Status of graduates (Bachelor's, Master's, PhD degrees) in STEM fields	Measurable evidence of structured and regular reporting on STEM graduates at Bachelor's, Master's, and PhD levels, integrated into national higher education metrics.	3
	Status of development and accessibility of STEM-related tertiary education programmes	Measurable evidence of structured STEM-related programmes available across a significant number of tertiary institutions, with growing alignment with national educational and economic priorities.	3
	Status of students enrolled in Al and data science programmes at tertiary institutions	Evidence of increasing student enrolment in AI and data science programmes, with gradual expansion in course offerings and awareness driving participation.	2

Sub-domains	Indicators	Measurements	
Workforce enablement	Status of AI courses available in English (OECD)	Emerging evidence of the availability of Al courses in South Africa in English is isolated to a few institutions and primarily focused on postgraduate or niche certifications. No evidence of Al courses in the other official languages.	1
	Status of diversity in Al talent (e.g., women, underrepresented minorities)	Representation of women and underrepresented minorities is steadily increasing, supported by structured diversity initiatives and growing alignment with global inclusion trends. South Africa is beginning to close gaps with regional benchmarks.	3
	Status and extent of Al skills migration	South Africa shows minimal AI skills migration, with a persistent outflow of talent and no significant inflow or policies to address the skills gap.	1
	Status of participation in Al-related training programmes within the various SETAs	Evidence of isolated or minimal participation in Al-related training programmes within SETAs, with offerings limited to a few sectors and low engagement rates.	1
	Status of availability and uptake of Al-related micro-credential programmes in South Africa	Evidence of growing Al-related micro-credential programmes, with increasing institutional awareness and limited local contextualisation to meet South African workforce needs. Specific industries or regional demands drive uptake.	2
	Status and uptake of Al- related learning content in CPD programmes across sectors	Evidence of isolated or minimal initiatives demonstrating the inclusion of Al-related content in CPD programmes is limited to a few (professional) bodies or Al-related institutions (e.g., isolated programmes without measurable outcomes).	1
	Status of training budget allocations by organisations towards upskilling employees in digital and Al-related skills	Evidence of isolated or minimal training budget allocations towards Al-related upskilling, with initiatives limited to a few organisations and ad hoc strategies.	1
	Status of growth in the workforce with AI skills	Evidence of early efforts to increase the Alskilled workforce, with moderate growth in skilled professionals.	2

An expanded assessment of each indicator within the sub-domains is provided below.

Education and training

• Status of digital literacy proficiency among the general population (Score: 2)

The National Digital and Future Skills Strategy underscores the need for coordinated efforts to enhance digital literacy among citizens. Its implementation programme¹¹⁰ outlines key measures, identifies lead institutions and stakeholders, and details the required inputs, activities, outputs, outcomes, and impacts. There is evidence of digital literacy training programmes to improve citizens' digital competence. The National Electronic Media Institute of South Africa (NEMISA),¹¹¹ a state-owned entity under the DCDT, plays a key role, alongside multinational corporations,^{112,113} South African companies through corporate social responsibility initiatives,¹¹⁴ and non-profit organisations¹¹⁵ engaged in digital skills development. Although a digital skills framework has been developed to assess proficiency levels among South African citizens,¹¹⁶ it has not yet been adopted nationally.

In terms of international benchmarks, the Portulans Institute's Network Readiness Index (NRI)¹¹⁷ functions as a tool for policymakers, businesses, and stakeholders to evaluate and enhance digital ecosystems. In 2024, Mauritius was ranked as the top-performing country in Africa (positioned 60th amongst 133 countries), Seychelles in second position (71st), and South Africa third (72nd). However, it is noteworthy that the NRI particularly highlights South Africa's persistent challenges in developing digital skills among citizens. This is indicative of the country's performance on the People Pillar, where South Africa, in 103rd position, trails behind Seychelles (61st), Mauritius (75th), Kenya (89th) and Ghana (102nd).¹¹⁸

Status of integration of Al-related topics in education curriculum (Grade 7 and Grade 12 levels) (Score: 2)

Al-related topics are being introduced in pilot programmes, such as the Coding and Robotics Curriculum for Grades R to 9,¹¹⁹ but these initiatives are not yet fully integrated into the national curriculum for Grades 7 and 12 students.¹²⁰ While these early efforts show promise, they have not been widely adopted or formalised nationally, leaving gaps in nationwide Al education.¹²¹

Status of students matriculating with STEM subjects (Score: 2)

Efforts to track STEM matriculation rates are emerging through systems like the Education Management Information System¹²² and CAPS documentation.¹²³ However, these efforts remain fragmented, and STEM enrolment is not consistently promoted or supported nationally. The disparities in access to quality STEM education across regions contribute to inconsistent participation rates.¹²⁴

Learner performance in Mathematics warrants specific mention in the assessment. South African students have consistently underperformed in international assessments. In the 2019 Trends in International Mathematics and Science Study (TIMSS), the country's Grade 9 learners ranked second-lowest out of 39 participating countries. At the primary level, South Africa had the third-lowest score among 64 countries, with only 37% of Grade 5 learners reaching the Low International Benchmark. This indicates foundational gaps in mathematics proficiency, with potential negative implications for developing Al-related human capacity for future Al use and development.

Status of AI vocational training and certification programmes available nationally (Score: 1)

Al vocational programmes are in the early stages of development, with limited availability and no standardisation across the country. These programmes are typically unaccredited and are offered on a small scale, restricting access by broader population sectors. A lack of formalised certification processes further limits their influence on workforce development.

Graduates (Bachelor's, Master's, PhD degrees) in STEM fields (Score: 3)

South Africa has a strong system for reporting STEM (Science, Technology, Engineering, and Mathematics) graduates through the Higher Education Management Information System (HEMIS),¹²⁹ which provides reliable data on the number of STEM graduates at Bachelor's, Master's, and PhD levels.¹³⁰ Available data on the percentage of STEM PhD graduates per annum indicate that 47.6% of all 2020 PhD graduates qualified in STEM-related fields.¹³¹ The structured reporting indicates that South Africa produces a substantial base of STEM graduates (almost 50% of PhD graduates), although continued efforts are necessary to meet the increasing demand for skilled professionals in the digital economy.¹³²

Status of development and accessibility of STEM-related tertiary education programmes (Score: 3)

There has been significant progress in developing and expanding STEM-related tertiary education programmes, with over 120 private and public universities and colleges now offering STEM courses. Despite this growth, there are still challenges in ensuring equitable access to these programmes, especially in rural or underserved regions. Continued investment is needed to address these disparities and improve student access. 134

Status of students enrolled in AI and data science programmes at tertiary institutions (Score: 2)

The current Classification of Educational Subject Matter (CESM) does not specifically measure Al and data science programmes in particular, although the STEM category can be used as a proxy reference. According to this proxy, Al and data science programmes are growing at South African universities, but enrolment in these fields remains low and concentrated in a few select institutions. While there is increasing recognition of the importance of these fields, participation rates are still modest. The programmes need to be expanded across a broader range of institutions to meet the growing demand for Al talent.

Workforce enablement

Status of AI courses available in English (Score: 1)

South Africa contributes only a small fraction of global AI university courses offered in English (0-5%). These courses are offered at a limited number of institutions, restricting their availability to a broader audience. There is an urgent need to increase the number of AI courses in English to make them more accessible to both local and international students and to strengthen South Africa's position in the global AI education landscape. No indicator considers the availability of AI courses in the other official languages of the country.

Status of diversity in Al talent (e.g., women, underrepresented minorities) (Score: 3)

South Africa has made substantial progress in increasing gender diversity in the Al sector, with women constituting 31% of the Al workforce, surpassing the global average of 26.84%. However, while this is a positive sign, there is still a need for further improvement in diversity, particularly regarding other underrepresented and minority groups. The country must continue to push for more inclusive policies and initiatives to enable access to, and meaningful participation and long-term diversity and representation in the Al workforce.

• Status of AI skills migration (Score: 1)

South Africa faces a significant negative net migration rate for AI talent, ¹⁴² meaning that more professionals are leaving the country than arriving. This trend indicates that the local AI ecosystem is not yet competitive enough to retain top talent. Without effective strategies to attract and retain AI professionals, the country risks losing out on the benefits of a highly skilled AI workforce and local talent contributing to local AI innovation.

Status of participation in Al-related training programmes within SETAs (Score: 1)

Participation in Al-related training programmes within SETAs remains minimal, with little standardisation or widespread uptake.¹⁴³ SETAs are not yet prioritising Al training on a large scale, and the lack of data on participation suggests that these programmes are not yet integrated into broader workforce development strategies. More structured efforts are needed to enhance SETA involvement in Al training.

Status of availability and uptake of Al-related micro-credential programmes in South Africa (Score: 2)

Al-related micro-credential programmes are gradually becoming more available, with platforms like Coursera and EdX offering courses in Al and data science and related content. The University of Johannesburg¹⁴⁴ and Tshwane University of Technology¹⁴⁵ recently launched online short courses in Al for students, and the public in some respects. However, the uptake of Al-related short programmes or micro-credentials is still limited,¹⁴⁶ with only a few institutions and sectors engaging with them.¹⁴⁷ Expanding the availability of these programmes and increasing their uptake will be critical for equipping the workforce with Al-related skills.

Status and uptake of Al-related learning content in continuous professional development programmes across sectors (Score: 1)

Al-related content is largely absent from most CPD programmes. Where it exists, it is often driven by isolated, sector-specific initiatives rather than a coordinated, national effort. Some examples of Al programmes as either accredited CPD programmes or as part of ongoing professional training are: the SA Al Association, Al Media (organiser of the Al Expo Africa), ¹⁴⁸ and the recently launched CPD Accredited Al Skills Workshops. The Institute of Bankers includes Al courses as part of their CPD programmes, ¹⁴⁹ while the University of Cape Town, for example, launched an Introduction to Applied Machine Learning and Artificial Intelligence aimed at the electrical engineering sector. ¹⁵⁰

Status of training budget allocations by organisations towards upskilling employees in AI-related skills (Score: 1)

Many organisations in South Africa are allocating minimal resources to upskilling employees in Al-related skills.¹⁵¹ Although Al is recognised as a critical area for growth, training budgets are often deprioritised in favour of other business needs.¹⁵² More consistent investment is required to build a workforce capable of thriving in an Al-driven economy.¹⁵³

• Status of growth in Al-skilled workforce (Score: 2)

South Africa is experiencing growth in its Al-skilled workforce, as evidenced by increased Al-related job vacancies and the number of job seekers with Al skills.¹⁵⁴ However, the country still lacks precise data on the overall Al-skilled workforce and does not yet have a comprehensive national strategy to monitor and sustain this growth.¹⁵⁵ Continued investment in training and workforce development will be needed to support this growing demand for Al talent.¹⁵⁶



Considerations for advancing the maturity level of the country's education and workforce environment

Overall, the current maturity level for this domain can be described as Limited to Emerging, with indicator scores ranging from 1 to 3. Digital and AI skills development has been prioritised in policy but lacks systemic implementation. The integration of AI content in education and training systems is inconsistent.

To accelerate progress in this domain, the following strategic considerations are proposed:

Modernise and integrate AI education and digital literacy: Embed digital literacy and AI across all educational levels by adopting a national digital and AI competency framework. Apply this framework to integrate digital and AI competencies in school, TVET, and university curricula. Fast-track the training of educators with respect to digital and AI competency development, while promoting flexible learning pathways such as micro-credentials to keep pace with evolving technological needs. Accelerate digital and AI skilling and upskilling initiatives through the implementation of targeted interventions alongside the formal education sector.

Strengthen workforce development, retention, and inclusivity: Develop a robust AI workforce by aligning training programmes with industry needs and creating clear career pathways. Apply the proposed digital and AI framework to develop upskilling initiatives for the workforce. Targeted incentives and inclusive policies will help retain talent and address challenges such as skills migration and underrepresentation in the digital sector. Systematically monitor AI talent diversity and learning outcomes to inform inclusive policy-making and ensure the effectiveness of training interventions.





Table 15: Assessment of the Innovation and Research domain

Sub-domains	Indicators	Measurements	
Al research capability	Status of AI research facilities	Evidence of isolated or minimal AI research facilities, with capabilities limited to a few institutions focusing on niche or experimental projects. These facilities have low visibility and limited national impact.	1
	Status of national AI R&D outputs (i.e. academic publications, research reports) relative to overall national research output	Al research publications are emerging but remain modest, with outputs limited to a few institutions or specific sectors. National impact is low, and international visibility is minimal.	2
Generation and commercialisation of AI intellectual property	Status of local AI intellectual property creation through R&D	Evidence of early-stage efforts to create Al intellectual property through R&D, with structured initiatives supporting the development of patents, trademarks, or copyrights. These outputs are beginning to gain visibility within the national innovation ecosystem, but commercialisation efforts remain experimental or limited to pilots.	2
Government support and funding for AI research	Status of government investment and initiatives supporting AI research and innovation	Evidence of isolated or minimal government efforts to support AI research and innovation. Investment is limited to small-scale or experimental initiatives, with no clear national strategy or coordinated framework.	1
Collaborations and partnerships in AI research	Status of R&D project collaborations between SA government/ SA industry and international organisations	Emerging international collaboration in Al scientific publications, with co-authorship involving a few countries or regions. Domestic collaboration remains limited in scope, and international efforts are sporadic or sectorspecific.	2
Inclusivity and contextualisation in AI research	Status of the extent to which Al research addresses local languages, cultures, and societal needs	Evidence of growing AI research efforts addressing local contexts, including early initiatives to incorporate local languages or address specific societal challenges. These efforts remain fragmented and lack broader national coordination.	2
Investment treaties	Status of AI-related investment treaties	Evidence of isolated or minimal Al-related investment treaties, with limited agreements that are not directly focused on Al. Efforts are fragmented, with negligible national or international impact.	1

An expanded assessment of each indicator within the sub-domains is provided below.

Al research capability

Status of AI research facilities (Score: 1)

South Africa demonstrates limited evidence of established AI research facilities, with most activities confined to isolated initiatives within a few academic institutions and private organisations. Public and private investment levels remain significantly lower than leading AI research nations, highlighting the need for greater financial and policy support to expand these facilities. While entities such as the Centre for Artificial Intelligence Research (CAIR)¹⁵⁷ and IBM Research¹⁵⁸ in Johannesburg have made strides, their scope remains restricted, with minimal impact on the national or regional AI landscape. The lack of a coordinated national framework or significant investment in infrastructure further highlights the nascent state of AI research facilities in the country. Current efforts are fragmented, focusing primarily on academic outputs rather than large-scale, collaborative, or industry-integrated research.

Status of national AI R&D outputs (Score: 2)

Al-related research publications in South Africa remain a small proportion of the overall national research output. While institutions such as AIISA, ¹⁵⁹ the Wits MIND Institute, ¹⁶⁰ and CAIR¹⁶¹ contribute to AI research, South African research efforts are underrepresented in international, high-impact journals. The lack of coordinated national strategies to prioritise and scale AI research constrains growth, limiting South Africa's ability to compete on the global stage.

Generation and commercialisation of AI intellectual property

• Status of local Al intellectual property creation (Score: 2)

There is emerging evidence of Al-related patents and intellectual property (IP) creation in South Africa, such as the Al-driven solutions developed by Aerobotics and Cape Al. Recent developments in South Africa's Al sector have seen a modest but growing number of Al-related patents. The European Commission¹⁶² highlights the increasing interest in Al intellectual property, noting that Al-driven innovations are gradually gaining recognition.

However, challenges persist in securing IP rights due to evolving legal frameworks and a lack of standardisation. To enhance AI patenting activity, policy support and industry collaboration are essential to ensure that AI-generated solutions receive adequate legal protection and commercialisation opportunities. In addition, only a small percentage of these patents have been commercialised successfully, indicating a need for stronger support mechanisms for AI IP protection and market adoption. However, these efforts remain concentrated in specific industries, and commercialisation pathways are not well established. AI-related IP protection and innovation funding require strengthening to enhance national competitiveness.

Government support and funding for Al research

Status of government investment and initiatives (Score: 1)

Despite the establishment of initiatives such as AllSA¹⁶³ and the release of the draft National Al Policy Framework, funding and policy support for Al research remain limited. Al is not yet recognised as a strategic research area within national R&D priorities, limiting opportunities for large-scale government-backed initiatives. South Africa relies primarily on competitive research grants from organisations

such as the National Research Foundation (NRF)¹⁶⁴ and the South African Research Chairs Initiative (SARChI).¹⁶⁵ Currently, this initiative contributes towards the funding of research chairs, for example, at the University of Cape Town (SARChI Chair in AI Systems),¹⁶⁶ the University of Pretoria (SARChI Chair in AI for Sustainable Development),¹⁶⁷ and the University of the Western Cape (SARChI Chair in BioInformatics and Health Genomics, SARChI Chair in Nano-Electrochemistry and Sensor Technology).¹⁶⁸

Collaborations and partnerships in AI research

Status of R&D collaborations (Score: 2)

There is growing international collaboration in AI research, with partnerships between South African and international researchers and institutions. Various initiatives demonstrate the collaboration: (i) The AI Africa Consortium consists of a consortium of universities, research organisations and government agencies, led by the University of the Witwatersrand, in support of Cirrus. (ii) UCT is participating in the Artificial Intelligence for Development in Africa (AI4D) scholarship project to foster talent in responsible AI and ML in African public universities. (iii) The European–South African Science and Technology Advancement Programme (ESASTAP) aimed to strengthen technology, research, and innovation cooperation between Europe and South Africa. It facilitated South African participation in Horizon 2020 and promoted reciprocal European participation in South African programmes. However, these partnerships are often limited to individual research projects, rather than forming part of a nationally coordinated AI R&D strategy.

Inclusivity and contextualisation in AI research

Status of local context in AI research (Score: 2)

South Africa has made progress in AI research addressing local languages and cultural needs, such as the MzansiMed-Rx¹⁷¹ project and the work of the South African Centre for Digital Language Resources (SADiLaR).¹⁷² However, these initiatives require greater support to be integrated into broader AI research and innovation frameworks.

Investment treaties

• Status of Al-related investment treaties (Score: 1)

South Africa has not yet developed Al-specific investment treaties, and existing international agreements do not prioritise Al research or innovation. However, discussions on Al investment policies have been initiated through various trade and economic forums, including exploratory dialogues within the African Union's Agenda 2063¹⁷³ framework and bilateral engagements with key trade partners. These efforts indicate a growing recognition of the need to integrate Al considerations into future investment agreements.

The African Continental Free Trade Area (AfCFTA), a key Agenda 2063 flagship project, was endorsed in January 2012 by the AU Heads of State. It aims to boost intra-African trade and enhance Africa's global trade position by unifying the continent's voice and expanding policy space in trade negotiations. For Africa, AI is a key driver for Agenda 2063 and the SDGs, offering opportunities to spark innovation, create high-value jobs, and advance cultural integration. In July 2024, the African Union Executive Council endorsed the Continental AI Strategy, committing to a development-focused, Africa-centric approach to ethical and inclusive AI.¹⁷⁴



Considerations for advancing the maturity level of the country's innovation and research

Overall, the current maturity level for this domain can be described as Limited to Emerging, with indicator scores ranging from 1 to 2. South Africa has strong academic institutions working on AI, but research output is low in volume and impact. There is minimal commercialisation and contextual relevance.

To accelerate progress, the following strategic considerations are proposed:

Develop a coordinated AI research ecosystem: A robust AI future begins with a unified national strategy that strengthens research infrastructure, increases national funding for R&D, and elevates scholarly outputs. This includes investing in state-of-the-art facilities, supporting public-private partnerships, and providing targeted grants and open-data initiatives. Existing AI research and innovation clusters should be reinforced, while new hubs focused on IP commercialisation are established. Research must be context-specific, addressing local languages and cultural needs, and its impact systematically monitored using international benchmarks to ensure global relevance and competitiveness.

Foster innovation, collaboration, and inclusivity: Create an innovation-driven environment that transforms AI research into market-ready solutions by establishing clear IP frameworks, supportive legal and funding mechanisms for startups, and proactive policies that attract strategic investment. Encourage demand-side adoption of AI by promoting uptake among businesses, government, and civil society in contextually relevant ways. Strengthen domestic and international collaboration to ensure AI development is inclusive, culturally grounded, and aligned with sustainable, ethical growth.





Table 16: Assessment of the Growth of the AI Ecosystem domain

Sub-domains	Indicators	Measurements	
Innovation hubs	Status of Al innovation hubs and enabling ecosystems	Documented evidence of formalised AI hubs operational and expanding across key sectors.	
	Status of collaboration and communication between Al innovation hubs and key stakeholders, such as government, universities, and industry	Documented evidence of early-stage collaboration, with basic communication channels between AI hubs and universities/industries.	2
Startup support	Status of support for AI startups and growth of AI-related businesses (i.e. incubators, accelerators)	Documented evidence of basic support systems emerging, such as grants or accelerators.	2
	Status of Al-related startups and businesses	Evidence of minimal tracking of startup outcomes.	1
Ecosystem growth	Status of AI ecosystem growth	Documented evidence of slow growth in the Al ecosystem, with emerging participants.	2
	Status of Al adoption by established companies across industry actors	Documented evidence of growing Al adoption, with several companies in select sectors beginning to integrate Al solutions.	2
Al investment and funding	Status of overall AI investment growth (including international and local investment)	Evidence of limited investment in AI from isolated institutions, with no structured strategy.	1
	Status of local Al investment growth	Evidence of a few local companies investing in AI, with limited industry engagement.	1
	Status of local Al knowledge creation through R&D	No evidence of Al-related patent growth.	0
	Status of venture funding activity with appetite for South African Al investments	Evidence of minimal private equity investment in AI, with a few isolated investments.	1

An expanded assessment of each indicator within the sub-domains is provided below.

Innovation hubs

• Status of technology innovation hubs and enabling ecosystems (Score: 3)

The Al innovation hubs in South Africa have developed foundational infrastructure and established active collaborations with academic institutions, industry partners, and government bodies. These hubs are engaged in research projects, capacity-building initiatives, and pilot programmes aimed at integrating Al solutions across various sectors. For instance, AllSA¹⁷⁵ has launched hubs focusing on sectors like health care, agriculture, and fintech, indicating a strategic approach to sector-specific Al development. Despite these advancements, challenges such as resource constraints, the need for more extensive industry partnerships, and the scalability of initiatives remain.

• Status of collaboration and communication between technology innovation hubs and key stakeholders such as government, universities, and industry (Score: 2)

The AI innovation hubs, including AIISA, have initiated collaborations with local universities. The AI Hub of the Central University of Technology (CUT)¹⁷⁶ recently launched an Artificial Intelligence Universities Programme in collaboration with Microsoft. These collaborations often involve joint research projects, workshops, and pilot programmes aimed at integrating AI solutions into various sectors. However, these collaborations are typically ad hoc and lack a cohesive framework, resulting in inconsistent communication and limited scalability. For example, Google's AI First Accelerator for Africa¹⁷⁷ has partnered with select universities and industries to mentor AI startups, but these partnerships are not yet widespread or deeply integrated across the ecosystem.

Startup support

• Status of support for AI startups and growth of AI-related businesses (i.e. incubators, accelerators) (Score: 2)

The support for AI startups includes structured accelerators, funding programmes, and mentorship opportunities.¹⁷⁸ Organisations such as the AIISA and the CUT AI Hub are actively involved in fostering startup growth.¹⁷⁹ However, the existing ecosystem lacks robust mechanisms to systematically measure the long-term success and scalability of these startups.

Status of Al-related startups and businesses (Score: 1)

Basic data collection on Al-related startup performance is being conducted through individual programmes, but there is no centralised system to monitor and analyse these outcomes comprehensively. This limits the ability to optimise fiscal, technical, or operational support structures and improve success rates systematically. There have however been several significant exits of Al firms, for example Al-first financial reporting platform Syft sold to Xero for R1.3bn in September 2024.

Ecosystem growth

Status of AI ecosystem growth (Score: 2)

The growth of AI participants in South Africa is driven by a combination of government initiatives, academic contributions, and industry adoption. While there are reports on the number of startups and businesses entering the ecosystem, there is a lack of detailed data on annual growth rates and participant impact. B3,184

Status of AI adoption by established companies across industry sectors (Score: 2)

While some companies have begun integrating AI solutions to optimise operations, the adoption remains concentrated in a few industries. Broader sectoral adoption and systematic tracking and reporting of AI implementation outcomes are needed to advance maturity, notably to contribute to national assessment of AI awareness, impact and perception. 185,186

Investment and funding

Status of overall Al investment growth, including international and local investment (Score: 1)

There is little to no evidence of investment in AI according to the OECD¹⁸⁷ and Databank portals.¹⁸⁸ This does not imply that there is no investment in AI, however, but could point to a structural issue regarding the tracking and/or declaration of investment in AI.

In early 2025, Microsoft announced a planned investment of ZAR 5.4 billion by the end of 2027 to expand its cloud and Al infrastructure in South Africa, addressing rising demand for Azure services. This follows a prior investment of ZAR 20.4 billion over the past three years to establish South Africa's first enterprise-grade data centres in Johannesburg and Cape Town. ¹⁸⁹

Amazon Web Services (AWS) has also announced plans to invest R30.4 billion in South Africa's cloud infrastructure by 2029. This builds on its ongoing investment in the AWS Africa (Cape Town) Region, which began in 2018. AWS estimates that the total investment from 2018 to 2029 will amount to R6 billion for construction, operations, and maintenance. The investment is expected to contribute approximately R80 billion to South Africa's GDP and support over 5,700 full-time equivalent jobs annually in local businesses, highlighting AWS's growing economic impact in the region. ¹⁹⁰

• Status of local Al investment growth (Score: 1)

There is little to no publicly available evidence of local investment (for example, through venture capital) in Al. While this is not an indication of no local investment, as there are many ICT investment initiatives within South Africa, it could be that funding/investment initiatives need to be further differentiated.¹⁹¹, ¹⁹² It is noteworthy, however, that at the time of assessment, South Africa had been reported as playing a leading role in Africa in terms of commercial development in Al, with approximately 726 companies specialising in Al.¹⁹³

Although the Southern African Venture Capital and Private Equity Association (SAVCA) reporting does not specifically distinguish Al-related investment activity, ICT investment activity and investment appetite can be viewed as being a positive sign for the growth potential of the Al sector, as more and more ICT technologies are integrating Al into products, services, or operations.

Status of local Al knowledge creation through R&D (Score: 0)

The available data does not provide South Africa-specific data on AI patent growth for 2024. However, regional-level insights might assist in inferring South Africa's performance in terms of global AI trends. Sub-Saharan Africa accounts for 0.12% of granted AI patents globally (as of 2022) compared to the 75.2% of East Asia & Pacific and the 21.2% of North America.¹⁹⁴

Status of venture funding activity with appetite for South African AI investments (Score: 1)

The SAVCA 2024 Venture Capital Survey¹⁹⁵ highlighted strong growth in South Africa's venture capital market for 2023. Notably, total invested capital surpassed R3 billion for the first time since the survey began, contributing to a cumulative R10.73 billion across 1,106 deals over 14 years. Although the number of deals declined slightly from 2022, activity remained above pre-pandemic levels, indicating a shift toward fewer but larger investments. The ICT sector – led by Fintech and Software – dominated, attracting nearly 88% of total capital.

Independent funds were the most active investors, followed by corporate ventures and angel investors, who made fewer but higher-value deals. The survey also reflected encouraging progress in diversity, with over 70% of respondents achieving B-BBEE Level 4 or higher and many led by female CEOs or black founders. Overall, the 2023 venture capital landscape shows a maturing ecosystem and growing investor confidence. To sustain this momentum, continued regulatory support will be vital in unlocking further innovation and growth in the South African economy.

The SAVCA 2024 Private Equity Industry Survey¹⁹⁶ reveals that the ICT sector remains a significant focus within South Africa's private equity landscape. While overall deal activity was somewhat muted in 2023, the ICT sector, including information technology and telecommunications, showed notable resilience. Specifically, 4.9% of total investment value was directed toward Information technology and 6.9% toward telecommunications. Despite a small decrease from the previous year, these sectors continue to attract investor interest due to their role in digital transformation, innovation, and scalable business models. Importantly, companies within the ICT space reported strong financial performance, with 55% of IT portfolio companies achieving over 20% compound annual revenue growth from 2021 to 2023.

The survey also highlights that private equity firms in Southern Africa increasingly see technology as a core strategic theme. Most firms (61%) outsource technology-related functions, signalling a prioritisation of digital efficiency and transformation. Furthermore, 43% of Southern African firms expect operational improvements – including technology enhancements – to be the primary lever for value creation in upcoming exits. These insights underscore the growing recognition of ICT not only as an investment sector but also as a driver of value and competitiveness across PE portfolios.





Considerations for advancing the maturity level of the country's Al ecosystem

The current maturity level for this domain is considered Limited. The scores for the various indicators range from 0 to 3. The ecosystem remains fragmented with limited startup support and venture funding. Collaboration across sectors is limited, and Al adoption by industry is inconsistent.

To move beyond this foundational phase and accelerate progress, the following strategic considerations are proposed:

Strengthen AI funding and ownership: Targeted initiatives should be constructed to secure government funding for AI, ensuring strategic alignment across key sectors linked to the NDP 2030. Equally important is encouraging AI-related development and ownership, fostering local innovation and long-term sustainability in the AI ecosystem.

Develop Al job-creation strategies: Policies and strategies should be developed together with industry and key employment sectors to drive Al-related employment, ensuring alignment with the government's national agenda to support economic growth and workforce development in an aligned and sustainable manner.

Prioritise government-driven investment initiatives: An AI strategy should outline the top three to five key local sectors in which AI investment should be prioritised in line with the NDP 2030. Investment in these sectors should be increased through government-led initiatives to drive innovation and economic growth. This includes procuring computing infrastructure to advance public sector R&D and providing incentives for AI adoption in priority sectors such as health and agriculture.

Facilitate local AI investment: Policies and regulations should be developed, or existing frameworks enhanced, to make AI investment opportunities discoverable, more accessible, and beneficial for local companies. Fostering investment in the local AI ecosystem through incentives for alternative cloud solutions developed locally for local entities can enhance data sovereignty and reduce the cost of cloud access and storage.



Table 17: Assessment of the Data and Digital Infrastructure domain

Sub-domains	Indicators	Measurements	
Data availability	Status of government (open- access/open-source) and/or industry (open-access/open- source) datasets available for Al development	Evidence of initiatives or partnerships to provide open datasets, though they are still fragmented. Isolated institutions or sectors share datasets, but there is no cohesive national strategy for data readiness. Initial participation in open data platforms, with minimal usage.	2
Al solutions availability	Status of AI-related government/ industry APIs providing structured access to datasets available for AI development	Evidence of well-documented APIs that are being made available by both government and industry, with evidence of their integration into AI development projects. Evidence of such APIs being used by AI researchers and developers.	3
	Status of locally developed AI applications (specifically ML, LLMs, and local languages)	Documented evidence of the presence of locally developed AI applications found in data source review, with initiatives that are emerging, but do not yet show documented impact.	2
Infrastructure investment	Status of GDP expenditure on digital infrastructure	Evidence of early-stage GDP expenditure on digital infrastructure.	2
	Status of GDP expenditure on Al- related initiatives (i.e. project, digital infrastructure)	Evidence of limited GDP expenditure on Al-relate initiatives (i.e. projects, digital infrastructure)	
	Status of energy spending on Al-related initiatives (including infrastructure)	Specific data on energy expenditures allocated to AI-related initiatives in South Africa is currently scarce.	1
	Status of spending on protection and safeguarding of Al-related initiatives (including infrastructure)	Information regarding specific expenditure on the protection and safeguarding of Al-related initiatives and infrastructure in South Africa is currently limited.	1
Infrastructure	Status of data centres nationally	Measurable evidence of a growing number of data centres, with increasing capacity to meet national and regional digital needs.	3
	Status of high-performance computing clusters	Evidence of early-stage growth in high- performance computing clusters, with new facilities being developed to meet rising demand.	2
	Status of Al-digital infrastructure	Infrastructure development is emerging, with initial deployment of technologies like 5G in limited areas. Progress is observed, but coverage and integration are incomplete.	2
	Status of total population with access to electricity	Measurable evidence of increasing electricity access among the population, with visible improvements in infrastructure.	3

An expanded assessment of each indicator within the sub-domains is provided below.

Data availability

Status of government (open-access/open-source) and/or industry (open-access/open-source) datasets available for Al development (Score: 2)

South Africa has made efforts to provide open-access datasets for Al development, but availability remains inconsistent across national, provincial, and municipal levels. While national platforms like the South Africa Data Portal offer datasets in sectors such as health and education, ¹⁹⁷ limitations in scope, frequency of updates, and data standardisation hinder their usability for Al training. Provincial and municipal datasets are even more fragmented, with only a few regions actively promoting open-data initiatives. ¹⁹⁸ Civil society organisations, including OpenUp¹⁹⁹ and Open Cities Lab, ²⁰⁰ have taken steps to improve access and usability, yet challenges in comprehensiveness and accessibility persist.

Availability of AI solutions

 Status of Al-related government/industry APIs providing structured access to datasets available for Al development (Score: 3)

South Africa has made progress in developing APIs that provide structured access to government and industry datasets, but availability remains limited and inconsistent. At the national level, initiatives like the Municipal Money API²⁰¹ and CIPC's APIVerse Hub²⁰² offer structured data access, while Stats SA primarily relies on manual downloads, limiting real-time AI applications.²⁰³ Provincial and municipal-level API adoption is slower, with only a few entities, such as the City of Cape Town, providing limited API access. Civil society organisations, including OpenUp²⁰⁴ and Open Cities Lab,²⁰⁵ play a key role in expanding API availability, but challenges in data standardisation, comprehensiveness, and accessibility persist.

 Status of locally developed AI applications (specifically ML, LLMs, local languages) (Score: 2)

South Africa has seen significant progress in the development and application of AI, particularly in machine learning (ML), large language models (LLMs), small language models and local language processing. Collaborations between government, academia, and industry have driven advancements, resulting in the creation of locally relevant AI tools. Examples include InkubaLM, VulaVula, Despite and products and tools developed through the Masakhane Initiative. Despite these advancements, challenges in scaling these applications and ensuring widespread accessibility remain.

Infrastructure investment

Status of GDP expenditure on digital infrastructure (Score: 2)

Internationally, South Africa's investment in digital infrastructure is estimated to be between 1.5% and 2.0% of GDP, which aligns with the average for African countries but falls short of the 3.2% average in advanced economies.²¹⁰

Over the past five years, major telecommunications companies in South Africa have invested approximately USD 11.45 billion (ZAR 200 billion) in establishing fibre optic networks and data centres, enhancing connectivity and supporting the burgeoning digital economy.²¹¹ This substantial investment underscores the country's commitment to strengthening its digital infrastructure, which is foundational for Al development and deployment.

• Status of GDP expenditure on Al-related initiatives (i.e. projects, digital infrastructure) (Score: 2)

In the Government AI Readiness Index 2024, South Africa is ranked second in Sub-Saharan Africa, following Mauritius.²¹² The index evaluates countries' preparedness to implement AI in public services, considering factors such as government strategy, technology sector strength, and data infrastructure. South Africa leads the region in both the Data and Infrastructure and Technology Sector pillars. Notably, it is the only country in Sub-Saharan Africa to score above the global average in the Technology Sector pillar, highlighting its relatively advanced technological ecosystem within the region.

The AI market in South Africa is estimated to be worth USD 3.18 billion in 2024 and is projected to grow to USD 8.74 billion by 2030.²¹³ While specific figures detailing the percentage of GDP allocated exclusively to AI-related initiatives are limited, the government's focus on leveraging the Fourth Industrial Revolution (4IR) to boost innovation and economic competitiveness indicates a strategic emphasis on AI.²¹⁴

Status of energy spending on Al-related initiatives (including infrastructure) (Score: 1)

Specific data on energy expenditure allocated to AI-related initiatives in South Africa is currently scarce. However, the potential for AI technology to address energy challenges by improving grid access and capacity is recognised. This indicates an emerging awareness of the role AI can play in optimising energy infrastructure, although explicit spending figures are not readily available.

However, AI can potentially address energy challenges in the country by improving grid access and capacity. AI-driven planning tools can identify areas with limited energy access, enabling efficient deployment of power generation and transmission infrastructure.²¹⁵ This suggests an emerging recognition of the role AI can play in optimising energy infrastructure, although explicit spending figures are not readily available.

Status of spending on protection and safeguarding of Al-related initiatives (including infrastructure) (Score: 1)

Information regarding specific expenditure on the protection and safeguarding of Al-related initiatives and infrastructure in South Africa is currently limited. As the digital and Al sectors expand, it is anticipated that investments in cybersecurity and related protective measures will become increasingly significant. Notably, the need for cybersecurity products is growing, increasing company spending to about 8% of the total IT budget.²¹⁶ This trend reflects a broader awareness of the importance of securing digital assets, which would encompass Al-related infrastructure.

The South African government has recognised the critical importance of cybersecurity and has undertaken several initiatives to strengthen its capacity. The National Cybersecurity Policy Framework (NCPF)²¹⁷ was adopted to provide a holistic approach to cybersecurity, emphasising the need for reviewing and aligning existing legislation to ensure a coherent legal framework. The NCPF also discusses the establishment of a Cybersecurity Response Committee, led by the State Security Agency, to oversee and coordinate cybersecurity efforts, and creating the Cybersecurity Hub within the Department of Telecommunications and Postal Services to facilitate public-private partnerships and manage cybersecurity incidents.

Despite these efforts, implementation has been slow, and the government faces significant challenges. In 2024, South African organisations and government agencies experienced an average of 1,450 cyberattacks per week, highlighting the increasing frequency and severity of cyberthreats. Critical infrastructure, including healthcare systems and utilities, has been targeted, underscoring vulnerabilities in the nation's cybersecurity defences.²¹⁸ The government sector is heavily targeted by botnets and ransomware, with information disclosure being the most common vulnerability exploited, impacting 73% of government organisations.²¹⁹ These incidents indicate that while frameworks are in place, effective implementation and enforcement remain areas requiring urgent attention to enhance the government's cybersecurity capacity.

Infrastructure

• Status of data centres nationally (Score: 3)

South Africa's data centre industry is experiencing significant growth, driven by increasing digitalisation, cloud adoption, and the need for robust IT infrastructure. In 2023, the South African data centre market was valued at approximately USD 1.95 billion.²²⁰ Projections indicate it will reach around USD 3.34 billion by 2032, reflecting a compound annual growth rate (CAGR) of 5.77% from 2024 to 2032.²²¹ The market's IT load capacity is expected to grow from 434.86 MW in 2024 to 828.93 MW by 2029, with a CAGR of 13.77%.²²²

Status of high-performance computing clusters (Score: 2)

As at November 2024, South Africa had no supercomputers listed in the TOP500 rankings of the world's most powerful high-performance computing (HPC) systems.²²³ The last notable entry, Lengau, debuted in 2016,²²⁴ but has since fallen off the list due to rapid global advancements in HPC technology. Despite this, South Africa remains a key HPC player in Africa, with the Centre for High Performance Computing (CHPC) providing vital computational resources for research and industry.²²⁵ The upcoming Square Kilometre Array (SKA) supercomputer is expected to enhance South Africa's HPC standing once operational.²²⁶

Status of Al-digital infrastructure (Score: 2)

Ranked 72nd globally,²²⁷ South Africa displays a mixed profile in digital readiness, with notable strengths in the digitalisation of businesses (34th) and in the adoption of future technologies (51st). South Africa's results in the public cloud computing market scale (23rd) and annual investment in telecommunication services (24th) are particularly impressive. It also demonstrates strength in digitally advanced business (34th) and computer software spending (28th), but encounters considerable hurdles in the area of digital inclusion (65th), specifically with regard to a socioeconomic gap in the use of digital payments (68th).

Status of total population with access to electricity (Score: 3)

While South Africa has achieved high electricity access rates in urban and periurban areas, significant disparities remain in rural regions, where access is often limited or unreliable. Persistent issues, such as load shedding, theft and damage to infrastructure, infrastructure maintenance challenges, and energy affordability, continue to hinder consistent electricity supply.²²⁸ Efforts to expand renewable energy projects and grid stability improvements are ongoing,²²⁹ but have yet to fully bridge the energy access gap.



Considerations for advancing the maturity level of the country's data and digital infrastructure profile

Overall, the current maturity level for this domain can be described as Emerging, with indicator scores ranging from 1 to 3. South Africa faces a digital divide, particularly in rural areas, with underdeveloped data-sharing policies and infrastructure gaps that limit AI scalability.

To accelerate progress, the following strategic considerations are proposed:

Expand the availability of open government and private sector datasets:

- Strengthen strategic governance through policy and regulation: Develop legal frameworks and adopt shared technology standards to allow secure cross-sectoral data exchange while safeguarding data privacy and sovereignty.
- Develop and implement a comprehensive open data framework: National Open Data Strategy: Formulate and implement a strategy that mandates the digitisation and open access of public sector data, adhering to 'Data for Good' principles.
- Implement data standardisation and quality assurance: Establish protocols to ensure data sets are standardised, accurate, and regularly updated, enhancing their utility for Al applications and research.

Invest in sustainable, scalable, and Al-ready infrastructure: Establish a unified national vision and clear regulations for building secure, sustainable, and Al-ready infrastructure. Prioritise investments in HPC and edge computing to meet the demands of Al research and applications, including the expansion and upgrading of data centres. Develop national standards for energy efficiency, certification, and environmental compliance. Ensure universal access to electricity and high-speed internet to enable equitable participation in the digital economy. Foster cross-sector collaboration to pool expertise and resources, and support the development of local Al solutions tailored to South African contexts, ensuring infrastructure investments translate into relevant, inclusive, and impactful applications.

Encourage energy self-sufficiency: A clear and supportive regulatory environment should facilitate data centre operations by offering incentives for energy and water conservation, while ensuring compliance with environmental and operational standards. To address electricity supply challenges, policies should promote the use of alternative energy sources like solar and wind for data centres and ICT industries relying on large data centres with high energy usage (e.g., Telcos and digital service providers), reducing reliance on the national grid while ensuring operational stability and easing grid pressure.



Table 18: Assessment of the Security and Privacy domain

Sub-domains	Indicators	Measurements	
Al data and security breaches	Status of Al-related data and security breaches, as well as national capability to respond to data and security breaches	Al-specific regulations were enacted. Metric: Evidence of Al data and security breach reporting and management of procurement laws, adopted and enacted at the national level. Deemed met when: At least one Al data and security breach reporting and management-specific law is officially enacted.	3
Adoption of best practices	Status of international best practice standards and practices in terms of cybersecurity of AI ecosystem components	Structured adoption of international cybersecurity standards is underway, with a 'mid-tier' ranking on relevant indices. Practices are more cohesive, showing consistent engagement and measurable progress.	3

An expanded assessment of each indicator within the sub-domains is provided below.

 Status of Al-related data and security breaches, as well as national capability to respond to data and security breaches (Score: 3)

South Africa faces growing AI security and privacy concerns, exacerbated by rising cyberthreats, regulatory gaps, and slow adoption of international best practices. While the Protection of Personal Information Act (POPIA) provides a legal foundation for privacy protection, enforcement and compliance remain inconsistent. Furthermore, AI-related security breaches have increased, exposing weaknesses in national cybersecurity policies and AI risk-management capabilities.²³⁰

South Africa's AI landscape shows moderate but improving capacity in both cybersecurity and responsible AI governance. According to the 2024 ITU Global Cybersecurity Index,²³¹ the country is placed in Tier 2 (Advancing), buoyed by strong legal frameworks (e.g., the POPIA, Cybercrimes Act), yet hindered by limited operational capabilities to address AI-driven threats. The Global Index on Responsible AI²³² highlights the need for more cohesive strategies to ensure the safety, accuracy, and reliability of AI, given that current efforts are often fragmented. Meanwhile, the IMF's AI Potential Index (AIPI) only measures factors like infrastructure and talent, leaving no direct rating for AI safety or security for South Africa.

 Status of international best practice standards and practices in terms of cybersecurity of Al ecosystem components (Score: 3)

South Africa's ongoing efforts to address AI data and security breaches reflect both progress and persistent challenges. The ITU publishes the Global Cybersecurity Index (GCI), which assesses the cybersecurity commitment of ITU member states across five pillars: legal measures, technical measures, organisational measures, capacity development, and cooperation.

Despite some improvements in cybersecurity governance, South Africa's ranking on the ITU Global Cybersecurity Index remains in Tier 2, trailing behind Ghana, Kenya, Mauritius, and Rwanda, which have made greater strides in implementing

Al-specific cybersecurity strategies, Al-focused risk assessment frameworks, and cross-sectoral Al security collaborations. The country has solid foundations, such as a well-defined national Cyber Incident Response Team (CIRT) and strategic oversight. However, continued investment in specialised skills and expanded coordination across government, private sector, and civil society should be emphasised to further bolster its ability to prevent and respond to complex cyber threats.

South Africa's performance in AI safety, accuracy, and reliability in the Global Index on Responsible AI 2024 is notably limited, with no comprehensive government-led framework or dedicated measures identified to enforce technical standards in this area. While the Index highlights that some African countries have engaged in relevant capacity-building, often driven by universities or civil society, South Africa's activities remain fragmented and insufficient to ensure robust safeguards against AI-related risks. As a result, the Index underscores the need for stronger oversight and dedicated policies to address the safety, accuracy, and reliability of AI systems in the country.



Considerations for advancing the maturity level of the country's security and privacy profile

This domain currently reflects a **Developing** level of maturity, with all indicators scoring 3. South Africa's security and privacy landscape in Al demonstrates early signs of institutionalisation, with several regulatory frameworks in place and a growing awareness of Al-specific risks. However, implementation remains uneven, and systemic coordination across sectors is lacking. To advance beyond the current 'Developing' level of maturity, a shift from foundational activities to structured, outcome-focused mechanisms is needed.

To accelerate progress, the following strategic considerations are proposed:

Strengthen Al cybersecurity governance and regulation: Update and enforce existing frameworks such as POPIA and the Cybercrimes Act to include clear requirements for Al-related breach reporting, mitigation, and compliance, with appropriate penalties for non-compliance. Introduce Al-specific privacy safeguards aligned with international standards (e.g., ISO, NIST) to ensure responsible data use.

Enhance national AI security infrastructure and capacity: Increase investment in AI-driven threat detection, encryption tools, and cybersecurity infrastructure, particularly to protect government systems. Establish a responsive national breach-reporting and monitoring framework, including an AI-specific incident database overseen by an independent body to guide prevention and response.

Build cross-sectoral cybersecurity capabilities: Foster collaboration across government, industry, academia, and civil society to drive cybersecurity innovation and coordinated response strategies. Expand cybersecurity and risk management training, making it mandatory for civil servants and widely accessible across sectors as part of broader digital upskilling initiatives.



4.3 Visualisation of the dashboard

The data visualisation for the South African Al Maturity Assessment Framework (Al MAF) was developed through a combination of analytical and visual tools, primarily using Power Bl.

The final visualisation incorporated several key elements:



a) Data integration: A data pipeline was established to automate and support future data processing and scoring. This involved using Azure Al tools to extract key insights from various documents, applying scoring models based on the proposed maturity scale, and storing the results in an Azure SQL database.



b) Visualisation design: The Power BI dashboard presents various views such as overall AI maturity, domain-specific assessments, and weighted scores per domain. Visualisations such as bar charts, tables, and slicers enable easy data exploration, providing insights into South Africa's AI maturity across multiple domains.

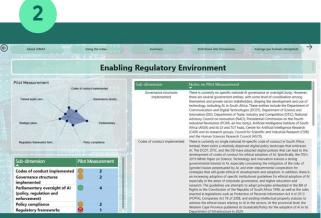


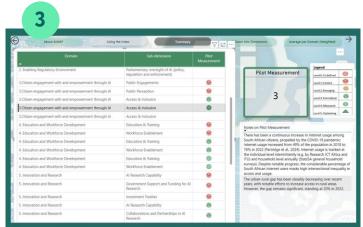
c) Interactive features: Users can interact with the dashboard to filter and explore different AI maturity domains and their respective subdomains, offering a dynamic and user-friendly experience.

This approach, leveraging AI for data processing and Power BI for visualisation, ensures that the insights from the AI MAF are accessible, interpretable, and actionable for stakeholders involved in AI policy and strategy in South Africa.

Figure 6: Illustration of the digital dashboard display







4.4 Setup and training of an Al agent to assist with Al maturity assessment

A step-by-step guide was designed for deploying the South Africa Al Maturity Framework Assistant (Al MAF Assistant) using Microsoft Azure Al Tools, Cognitive Search, and Data Pipeline Integration. The purpose of the Al Assistant (agent) is to facilitate the automatic process of updating measurements based on new information.

The process of training a GPT model using Copilot Studio was detailed, as well as the setup and integration of relevant data pipelines, specifically the integration of the Text Analytics API (or Azure Al Foundry) and Copilot Studio models into the Azure Data Factory pipeline.

The process of setting up the pipeline to automatically analyse each document, extract key information, and generate scores for each indicator was also documented. All Al Assistant processes need to be subject to human oversight.

The Al agent, data pipeline documentation, and the Power Bl data visualisations have been transferred to the CSIR for further deployment, updating, and maintenance.



Section 5

Conclusion

This section:

- Presents a **high-level overview** of Al maturity in South Africa across eight domains; and
- Presents **concluding remarks** on the value and relevance of the Al Maturity Assessment Framework and its measurement instrument, and the importance of their **ongoing refinement**.

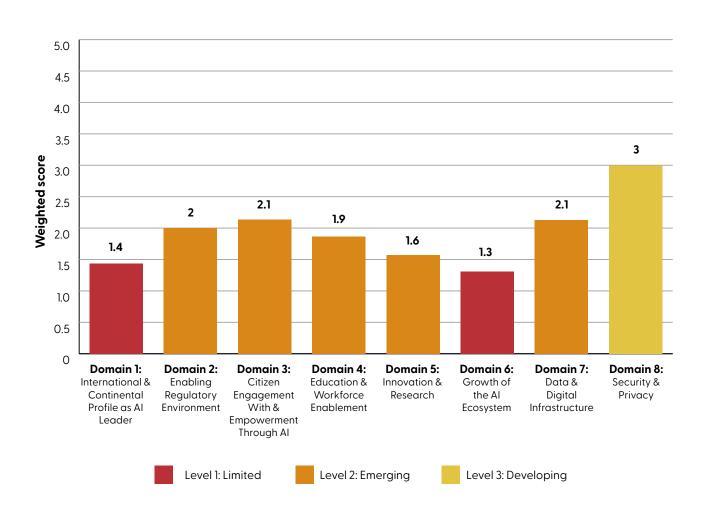
5.1 Introduction

This concluding section synthesises insights from the initial assessment, reflecting on the maturity level of South Africa's AI ecosystem. It summarises the overall assessment per domain and provides pointers in terms of advancing the AI maturity of the ecosystem. It further discusses the advantage of applying the ISO-informed assessment rubric, the necessity of adjusting the AI Maturity Assessment Framework (AI MAF) for sectoral application and invites stakeholders to participate in the further refinement of the framework.

5.2 High-level overview of Al maturity level across the eight domains

The overall maturity of the South African AI ecosystem across the eight domains, as assessed using the AI MAF introduced through this initiative, is illustrated in Figure 6. It provides a crucial diagnostic lens into South Africa's AI readiness and capacity. The domain scores shown in Figure 7 are weighted and reflect the project assumption that each domain contributes equally to the overall maturity, irrespective of the number of indicators contained therein. However, the weighting can be adjusted to support alternative assumptions as required, following the steps outlined in Section 3.4.

Figure 7: Overview of AI maturity level across the eight domains



Applying the ISO-informed assessment approach, the country's Al maturity in terms of the eight domains is described in Table 19 below.

Table 19: Level of Al maturity across the eight domains

Domain	Weighted score (max = 5)	Maturity
International and Continental Profile as Al Leader	1.4	Limited: Some documented evidence of engagement and action towards building an International and continental profile as an Al leader. Minimal associated activities.
Enabling Regulatory Environment	2	Emerging: Initial actions and evidence of national movement towards creating an enabling regulatory environment, though still low-ranking or lacking full impact. Visible activity but no clear, documented impact.
Citizen Engagement With and Empowerment Through Al	2.1	Emerging: Evidence is available, and associated actions have been initiated. Aggregation of initiatives and emergent behaviours is not yet evident.
Education and Workforce Enablement	1.9	Limited to Emerging: Documented evidence of engagement and action towards AI education and workforce enablement. Associated activities are emerging but not yet evident for all indicators.
Innovation and Research	1.6	Limited to Emerging: Documented evidence of engagement and action towards AI innovation and research capability development. Associated activities are not yet evident for all indicators.
Growth of the AI Ecosystem	1.3	Limited: Documented evidence of engagement and action towards the growth of the AI ecosystem. Associated activities are not yet evident for all indicators.
Data and Digital Infrastructure	2.1	Emerging: Initial actions and evidence of national movement towards creating an enabling data and digital infrastructure, though still low-ranking or lacking full impact.
Security and Privacy	3	Developing: Evidence of implementation of security and privacy activities is available. Activities have been initiated/approved and aggregated, and emergent behaviours can be observed.

South Africa was evaluated as being in the early stages of Al maturity, with seven of the eight domains assessed at Level 1–2 on the maturity scale, and only one domain reaching Level 3. This suggests that all domains demonstrate some level of foundational 'input activities', signalling a positive intent and growing awareness of the importance and relevance of Al.

The assessment also alludes to the appropriation and application of Al in key sectors such as health, finance, and agriculture. The highest scoring domain, security and privacy, demonstrates movement from input activities towards showing a positive outcome. Overall, progress across the domains seems to be fragmented, as reflected in the generally low maturity scores, which could be attributed to still limited strategic ecosystem coordination, targeted investment, and capability building.

Advancing to higher levels of AI maturity will require a comprehensive and integrated ecosystem-wide approach aimed at moving beyond foundational input activities towards evidence-based behavioural and transformative change initiatives. Targeted and systematic evidence-based behaviour or transformative interventions will translate national aspirations for the equitable and fair use and development of AI into tangible societal benefits.

5.3 The value of the framework

The selection of the AI MAF domains, sub-domains, and indicators is guided by the intention not to simply repeat what is available in global AI indices but rather to reflect the realities of the South African context.

The value of the use of the ISO-informed assessment instrument to determine the level of maturity lies in its ability to evaluate maturity through the lens of activities and inputs that lead to measurable outcomes and impact, and to integrate both qualitative and quantitative data sources for a more granular and contextually relevant view. Additionally, developing an Al agent can facilitate regular updates, thereby ensuring that the Al MAF remains a relevant strategic tool.

This evidence-based approach enables a reflection of the South African landscape, supporting strategic alignment across government, industry, and academia. The framework and dashboard developed through this project offer a foundational reference point to support South Africa's evolving Al landscape.

While not exhaustive or prescriptive, the framework, including the subdomains and indicators, provides a baseline from which government departments, researchers, and sectoral stakeholders can build, adapt, and expand according to their specific mandates, citizen needs and contexts.

The project team invite people to further refine the framework to sector-specific application to ensure, real time, data driven and responsive approach to developing the national AI ecosystem.

5.4 Conclusion

The global AI ecosystem is advancing with increasing momentum, and South Africa must keep pace with this rapidly evolving landscape to ensure its ability to retain agency in how AI is developed and deployed in line with national development agendas, while honouring its continental commitments. This requires leveraging its strengths and addressing its areas of weakness.

As a signatory to the Africa Declaration on Artificial Intelligence, which was adopted during the inaugural Global AI Summit on Africa held in Kigali, Rwanda in April 2025, South Africa has committed to a shared continental vision of harnessing AI for economic transformation, inclusive development, and global leadership in ethical AI. The declaration underscores the importance of the responsible design, deployment, and governance of AI technologies to ensure they benefit all Africans.

The theory of change of this AI MAF initiative was based on the premise that advancing AI in South Africa requires a clear understanding of the country's AI maturity. The AI MAF and first maturity assessment provide a baseline to identify gaps in AI capability, adoption, and governance. Ideally, this evidence should inform targeted interventions such as policy reforms, skills (re)development, and infrastructure investment, to bridge disparities in identified sectors and accelerate AI-driven growth. Over time, these interventions enable a more inclusive and competitive digital economy, where AI supports equitable access to opportunities and drives sustainable development.

Using the baseline information, stakeholders and specialists across relevant domains and sectors can develop and adapt their own theories of change to facilitate targeted activities and interventions to effect change aligned with their specific objectives and areas of focus, as well as the broader national vision.

Collectively, these efforts can help transform South Africa's fragmented Al landscape into a cohesive and coordinated ecosystem that supports economic growth, addresses social challenges, enhances global competitiveness, and promotes inclusivity. As Al capabilities expand, they present opportunities to address structural inequalities, improve service delivery, and unlock innovation-led job creation across key sectors such as health, agriculture, education, and financial services, thereby unlocking Al's full socioeconomic potential for all citizens.

A shared, regularly updated, evidence-based fact sheet such as the AI MAF can support a whole-of-society approach and facilitate meaningful partnerships between government, industry, civil society, and research institutions to help realise the full potential of AI for societal benefit.



Annexures

Annexure 1: Al Maturity Assessment Framework Version 1

Annexure 2: Stakeholder engagement (expert interviews and

workshops)

Annexure 3: Project team

Annexure 4: Al MAF Data Sources

Annexure 5: Al Maturity Assessment Instrument

Annexure 1: Al Maturity Assessment Framework Version 1

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Discussion Sheet (Group____)







KEY QUESTIONS? Evaluation of Indicators: Relevance of the Domain: Sustainable Measurement Sources: In your opinion, how essential is this domain to include in the SA AI MAF, considering the specific focus of the framework? Which of the identified indicators do you find most relevant for the South African context? Are there any indicators that you believe should be removed or added? Please provide your reasoning. What existing or potential sources could be used to measure these indicators in a sustainable manner? Are there any additional sources that should be considered? Please provide qualitative feedback and rate its importance on a scale of 1-10 (1 being not essential, 10 being highly essential). Name & Surname (Optional) Designation/Role

Annexure 2: Stakeholder engagement (expert interviews and workshops)

The AI Maturity Assessment Framework (AI MAF) expert interviews took place between August and September 2024, while the workshops were held in Johannesburg on 17 September 2024 and in Cape Town on 26 September 2024.

Expert interviews

Six experts from government, industry, academia, and research institutions were selected for expert interviews to ensure informed, diverse perspectives. The objective of the interviews was to assess the AI MAF's conceptual framework, specifically the logic of the vertical and horizontal maturity assessment, the relevance of domains and indicators, and to identify potential sectoral biases.

Workshops

The aim of the workshops was to co-design and evaluate the South African Al MAF through a collaborative and interactive process, ensuring broad stakeholder participation in shaping the framework. Discussions focused on the relevance and applicability of the domains and indicators, potential data sources, and the framework's alignment with South African realities. A database of over 1,600 stakeholders who had previously participated in Al-related events was compiled, and invitations were sent to encourage participation in the AI MAF stakeholder engagement workshops. In total, 42 stakeholders participated in the Johannesburg workshop, while 54 participated in Cape Town, representing industry, government, academia, and civil society.

The workshops followed a structured agenda, beginning with introductory remarks and a presentation on the purpose, methodology, and 14 key domains of the Al MAF. Participants were then divided into seven working groups, each assessing two domains, with facilitators guiding discussions and recordings, ensuring comprehensive documentation.

We would like to thank all of the workshop participants for their contributions.

Stakeholder (workshop and interview) feedback and **implications**

The workshops and interviews resulted in detailed recommendations for each of the domains. An overview of the key takeaways from the workshops is presented in Figure 8.

Figure 8: Key takeaways from AI maturity workshops



As an example of the detailed feedback per domain, a summary of the discussion regarding the Digital Infrastructure Readiness domain is presented below.

Digital Infrastructure Readiness

Discussions on this domain revealed significant gaps in digital infrastructure, particularly in rural areas. A key recommendation was to strengthen digital infrastructure readiness indicators by incorporating measures of digital inclusivity, such as free public Wi-Fi access and government-subsidised internet for underserved communities.

Beyond infrastructure, participants emphasised the importance of locally relevant Al solutions. They stressed that assessing digital readiness should go beyond simply measuring data availability to also consider data management, trustworthiness, and accessibility. Concerns were raised about the continued reliance on legacy systems, particularly in sectors like health care, where paper-based records remain widespread. In addition, participants underscored the need to integrate data from both public and private sources, advocating for stronger data governance to support Al development in critical areas such as health care.

While much of the current focus is on large language models (LLMs), participants highlighted the necessity of expanding Al applications to other vital domains, including geospatial data, agriculture, and climate monitoring. There was also a strong call to prioritise the development of Al models in local languages to enhance accessibility and inclusion for non-English speakers and open source approaches that enable access and facilitate collaboration.

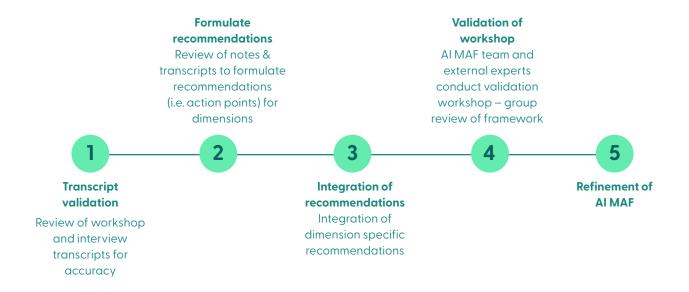
Examples of proposed revisions to the framework:

- Expand digital infrastructure indicators to measure digital inclusivity, including access to affordable or free internet services.
- Broaden data-related indicators to include private sector data, while emphasising governance and accessibility.
- Add a specific indicator on the development of local language AI models to enhance inclusivity.

- Include an indicator to measure the 'Proportion of GDP expenditure on digital infrastructure'.
- Aggregate internet access data by location for a more nuanced analysis.

Following the workshops and expert interviews, an integration process was undertaken to synthesise insights and refine the framework. This process included validation workshops with the internal project team and selected external experts, who reviewed and discussed the recommendations. A detailed overview of this process is provided in Figure 9. Ultimately, this process led to the current, refined version of the AI MAF presented in this report.

Figure 9: AI MAF stakeholder engagement integration and validation process



Annexure 3: Project team





Project Core Committee

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Dominique Goch, CoLab for elnclusion and Social Innovation, UWC

Jason Fortuin, CoLab for elnclusion and Social Innovation, UWC

Natashia Soopal, Executive: Ethics Standards and Public Sector, SAICA

Neto Maape, Next-Gen Enterprises and Inclusion, CSIR

Paulette Wekeyo, Seminars and Events Coordinator, SAICA

Dr Reevana Balmahoon, Next-Gen Enterprises and Inclusion, CSIR

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Lisel Engelbrecht, Standard Bank

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Prof. Emma Ruttkamp-Bloem, University of Pretoria **Lisel Engelbrecht,** Standard Bank Group

Zamokwakhe Dlamini, Department of Science, Technology and Innovation



Annexure 4: AI MAF Data Sources

Indexes included in AI MAF data sources

Al Preparedness Index (AIPI) – International Monetary Fund	International Monetary Fund (IMF). (2024). AI Preparedness Index 2024: Assessing AI readiness across countries. https://www.imf.org/external/datamapper/AI_PI%40AIPI/ADVEC/EME/LIC/SSQ
Global Index on Responsible AI – Tortoise Media	Global Al Index. (2023). <i>The Global Al Index 2023</i> . Tortoise Media. https://www.tortoisemedia.com/intelligence/global-ai
Global Index on Responsible AI 2024	Adams, R., Adeleke, F., Florido, A., de Magalhães Santos, L. G., Grossman, N., Junck, L., & Stone, K. (2024). <i>Global Index on Responsible Al 2024</i> . Global Center on Al Governance. https://www.global-index.ai/
Government Al Readiness Index	Oxford Insights. (2024). AI Readiness Index 2024: Government preparedness for artificial intelligence. https://oxfordinsights.com/ai-readiness/ai-readiness-index
GSMA Mobile Connectivity Index	GSM Association (GSMA). (2024). GSMA Mobile Connectivity Index. https://www.mobileconnectivityindex.com/index.html
Ipsos Al Monitor	Carmichael, M. (2024). <i>Ipsos 2024 Al Monitor</i> . Ipsos. <u>https://www.ipsos.com/en-us/ipsos-ai-monitor-2024</u>
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ITU Global Cybersecurity Index	International Telecommunication Union. (n.d.). Global Cybersecurity Index (GCI). https://www.itu.int/en/ITU-D/Cybersecurity/pages/global-cybersecurity-index.aspx
·	
Index Network Readiness Index	www.itu.int/en/ITU-D/Cybersecurity/pages/global-cybersecurity-index.aspx Dutta, S., & Lanvin, B. (Eds.). (2024). Network Readiness Index 2024: Benchmarking the

Reports included in AI MAF data sources

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Al security breach reports in compliance with POPIA	Information Regulator (SA). (2024). Al security breach reports in compliance with POPIA. https://www.inforegulator.org.za
Kenya National Al Strategy	Kenya Al Strategy. (2023). <i>Kenya National Al Strategy</i> . Ministry of Information, Communications, and the Digital Economy. https://ict.go.ke/sites/default/files/2025-01/MyGov%2014th%20January%202025.pdf
Mauritius AI and Digital Transformation Strategy	Mauritius Digital Roadmap. (2023). Mauritius AI and Digital Transformation Strategy. National Computer Board, Government of Mauritius. https://mdpa.govmu.org/mdpa/wp-content/uploads/2024/04/DigitalMauritius2030.pdf
National AI Government Summit Discussion Document	Department of Communications and Digital Technologies (DCDT). (2024). National Al Government Summit discussion document. https://www.dcdt.gov.za/images/phocadownload/Al_Government_Summit/National_Al_Government_Summit_Discussion_Document.pdf
National Cybersecurity Policy Framework	Government of South Africa. (2015). <i>National Cybersecurity Policy Framework</i> . https://www.gov.za/sites/default/files/gcis_document/201512/39475gon609.pdf
Rwanda Al Industry Strategy Report	Rwanda Ministry of ICT and Innovation. (2022). Rwanda AI Readiness and Maturity Framework. Government of Rwanda. https://www.minict.gov.rw/index.php?eID=dumpFile&t=f&f=85301&token=f82bac29a37d38769b37b356f37d137cb9eede03

Websites included in AI MAF data sources

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African Union Development Agency – New Partnership for Africa's Development (AUDA-NEPAD)	https://www.nepad.org/
Artificial Intelligence Institute of South Africa (AIISA)	https://aii-sa.co.za/
African Private Capital Association (APCA)	https://www.avca.africa/
Centre for Artificial Intelligence Research (CAIR)	https://www.cair.org.za/
Centre for High Performance Computing (CHPC)	https://www.chpc.ac.za/
Council for Scientific and Industrial Research (CSIR)	https://www.csir.co.za/
Coursera	https://www.coursera.org
Cybersecurity Hub	https://www.cybersecurityhub.gov.za/
Datacamp	https://www.datacamp.com
Department of Science, Technology and Innovation (DSTI)	https://www.dsti.gov.za
Department of Basic Education (DBE)	https://www.education.gov.za
Department of Higher Education and Training (DHET)	https://www.dhet.gov.za
Department of Trade, Industry and Competition (DTIC)	https://www.thedtic.gov.za/
EDx	https://www.edx.org
Eventbrite	https://www.eventbrite.com
Github	https://www.github.com
Google for startups: Accelerator - Al First, Africa	https://startup.google.com/programs/accelerator/ai-first/africa/
Google Trends	https://trends.google.com/trends/
Hugging Face	https://www.huggingface.co
Human Sciences Research Council (HSRC)	https://hsrc.ac.za/
IEEE Xplore	https://ieeexplore.ieee.org/Xplore/home.jsp
Information Regulator (South Africa)	https://inforegulator.org.za/
Khan Academy	https://www.khanacademy.org
MTN API Marketplace	https://www.mtn.com/api-marketplace/
National Electronic Media Institute of South Africa (NEMISA)	https://nemisa2.co.za/
National Integrated Cyberinfrastructure System (NICIS)	https://www.nicis.ac.za
National Research Fund (NRF)	https://www.nrf.ac.za/
National Treasury	https://www.treasury.gov.za
Public Library of Science (PLOS)	https://www.plos.org
Public Service Education and Training Authority (PSETA)	https://pseta.org.za/
Quality Council for Trades and Occupations (QCTO)	https://www.qcto.org.za/
Research ICT Africa: After Access	https://afteraccess.net/
Sector Education and Training Authorities (SETAs)	https://nationalgovernment.co.za/units/type/8/seta
South African Council for Educators (SACE)	https://www.sace.org.za/
Southern African Legal Information Institute (SAFLII)	https://www.saflii.org
South African National Research and Education Network (SANReN)	https://www.sanren.ac.za

Southern African Venture Capital and Private Equity Association (SAVCA)	https://savca.co.za
Square Kilometre Array (SKA) Computing and Data Processing	https://www.skatelescope.org
Stellenbosch University	https://www.sun.ac.za
University of Cape Town (UCT)	https://www.uct.ac.za
University of Pretoria	https://www.up.ac.za
University of the Witwatersrand (Wits)	https://www.wits.ac.za
World Intellectual Property Organization (WIPO)	https://patentscope.wipo.int/

Databases included in AI MAF data sources

Azure Open Datasets	https://azure.microsoft.com/en-us/services/open- datasets
Baxtel	https://baxtel.com
Cloudscene	https://www.cloudscene.com
Companies and Intellectual Property Commission (CIPC)	https://www.cipc.co.za
DataEQ	https://www.dataeq.com
Education Management Information Systems (EMIS)	https://www.education.gov.za/Programmes/EMIS.aspx
Google Dataset Search	https://datasetsearch.research.google.com/
Higher Education Management Information System (HEMIS)	https://www.dhet.gov.za/SitePages/Higher-Education- Management-Information-System.aspx
IBM Open Datasets	https://developer.ibm.com/data/
International Telecommunication Union (ITU) ICT Statistics	https://www.itu.int/itu-d/sites/statistics/
International Energy Agency (IEA) – Government Energy Spending Tracker: Policy Database	https://www.iea.org/policies
Kaggle	https://www.kaggle.com
National School of Government (NSG) database	https://www.thensg.gov.za
National Research Funds grant records	https://www.nrf.ac.za
Open Data South Africa (OPENDATASA, OPENDATAFORAFRICA)	https://southafrica.opendataforafrica.org/
OpenML	https://www.openml.org/
Organisation for Economic Co-operation and Development (OECD) data	https://data.oecd.org
Organisation for Economic Co-operation and Development (OECD) – Al Policy Observatory	https://oecd.ai
South African Medical Research Council (SAMRC) grant records	https://www.samrc.ac.za/research-capacity- development/grants
South Africa Social Attitudes Survey (SASAS)	https://hsrc.ac.za/special-projects/sasas/
Scopus	https://www.scopus.com
Statistics South Africa (Stats SA)	https://www.statssa.gov.za
Statista	https://www.statista.com
World Bank Group DataBank	https://databank.worldbank.org/reports. aspx?source=2&series=NY.GDP.PCAP.CD&country=ZAF&_ gl=1*c211ch*_gcl_au*Nzg3OTU5Njg0LjE3Mjl1MDc5OTQ

Annexure 5: Al Maturity Assessment Instrument

Structure of the Al Mate	urity Assessm	ent Framework	Level 0: No evidence can be found of commitment to or application of the principle. Not measurable	Level 1: Where evidence is available, it is limited to that of performing the minimum necessary to achieve the intent of the principle.	Level 2: Evidence is available and managed.	Level 3: Evidence is available, managed, and aggregated to form a cohesive system in which emergent behaviours can be observed.	Level 4: Evidence is available, managed, and aggregated, and it is measured or assessed.	Level 5: Evidence is available, managed, aggregated and measured or assessed, and it is optimised for continual improvement.	
Domain	Sub-domain	Indicator	Level 0: Undefined	Level 1: Limited	Level 2: Emerging	Level 3: Formalised	Level 4: Measured	Level 5: Optimising	Pilot Measureme nt
		Status of Recognition for Al leadership, competitiveness and/or maturity of Al industry as evidenced in ranking on global Al indices							
	Recognition on Global Al indices	Status of benchmarking against peer countries (such as the UAE, Kenya, Rwanda, India, and BRICS nations) as evidenced in ranking in global Al indices for Al leadership, competitiveness and/or maturity							
	Hosting and participation in	Status of Al leadership events hosted in South Africa (specifically national events, continental events, and global events)							
	leadership events	Status of participation of South African Al leaders in global and African forums and conferences, specifically in leadership roles							
International and Continental Profile as Al Leader	Responsible Al recognition	Status of recognition for Responsible AI (ethical and sustainable AI practices) as evidenced in ranking on The Global Index on Responsible AI							
	Al best practice adoption	Status of adoption of (new) ISO Al-related standards							
	Sustainable Al Investment	Status of Green (sustainable) Al guidelines that promote the development of energy-efficient Al models and the use of renewable energy sources in Al infrastructure							
	Sustainable Al Procurement	Status of Government AI procurement policies and initiatives supporting Responsible AI (Ethical and Sustainable AI), including Environmental Impact Assessments Status of Green (Sustainable) AI Guidelines that promote the development of							
	Strategic	energy-efficient AI models and the use of renewable energy sources in AI infrastructure Status of a national broad-based AI strategic/policy framework, and other							
	planning performed	sectoral, supportive and enabling policies (such as data, digital, cloud and cyber security, etc)							
	Governance structures implemented Regulatory	Status of a national AI governance body, and government departments and agencies addressing AI-related policy							
	frameworks formulated and enacted	Status of Al-specific regulation and number of Al-related laws enacted							
2. Enabling Regulatory	Codes of conduct implemented	Status of government developed code(s) of conduct to guide ethical and trustworthy Al adoption across institutions							
Environment	Parliamentary oversight of Al (policy, regulation and enforcement)	Status of a Parliamentary committee performing oversight of departments and agencies responsible for Al-related policy, regulation and enforcement							
	Compliance	Status of Al policy and regulation compliance mechanisms/frameworks, including Responsible Al, by participants in the ecosystem							
	Trained public servants (civil servants, judiciary, policy makers and regulators)	Evidence of training of public servants/regulators/policy makers in Al-related competencies							
	Public perception of Al	Status of mechanism(s) to assess public awareness of Al							
	Public Engagements	Status of government-led Al-related public engagement events (i e, conferences, seminars and workshops)							
3.Citizen engagement with	Access and Inclusion	Status of growth in the total population that uses the internet (households or individuals)							
and empowerment through Al		Status of gender parity in Internet usage							
		Status of rural/urban parity in Internet usage							
		Status of SA mobile data affordability as measured in the mobile data affordability ranking							
		Status of digital literacy proficiency among the general population							
		Status of integration of Al-related topics in Education Curriculum (at Grade 7 and Grade 12 levels)							
		Status of students matriculating with STEM subjects							
	Education and Training	Status of AI vocational training and certification programs available nationally							
		Status of Graduates (Bachelor's, Master's, PhD) in STEM fields							
		Status of development and accessibility of STEM-related tertiary education programs							
		Status of students enrolled in Al and data science programs at tertiary institutions							
4. Education and Workforce Development		Status of AI courses available in English as reflected in OECD data							
		Status of diversity in AI talent (e.g. women, underrepresented minorities)							
		Status and extent of AI skills migration							
	Workforce	Status of participation in Al-related training programs within the various SETAs							
	Enablement	Status of availability and uptake of Al-related micro-credential programs in South Africa							
		Status and uptake of Al-related learning content in continuous professional development (CPD) programmes across sectors							
		Status of training budget allocations by organisations for upskilling employees in digital and AI-related skills							
		Status of growth in workforce with Al skills							
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5. Innovation and Research	Al Research	Status of AI research facilities				
	Capability	Status of national AI R&D outputs (i e , academic publications, research reports) relative to overall national research output				
	Generation and Commercialisati on of Al Intellectual Property	Status of local At intellectual property creation through R&D				
	Government Support and Funding for Al Research	Status of government investment and initiatives supporting AI research and innovation				
	Collaborations and Partnerships in Al Research	Status of R&D project collaborations between SA Government/SA Industry and international organisations				
	Inclusivity and Contextualisatio n in Al Research	Status of the extent to which AI research addresses local languages, cultures, and societal needs				
	Investment Treaties	Status of Al-related investment treaties				
		Status of technology innovation hubs and enabling ecosystems				
	Innovation Hubs	Status of collaboration and communication between Al innovation hubs and key stakeholders, such as government, universities, and industry				
		Status of Support for AI startups and growth of AI-related businesses (i e incubators; accelerators)				
	Startup Support	Status of Al-related startups and businesses				
6. Al Ecosystem	Ecosystem Growth	Status of AI ecosystem growth				
Development		Status of Al adoption by established companies across industry actors				
	Al investment and funding	Status of overall AI investment growth (including international and local investment)				
		Status of local AI investment growth				
		Status of local Al knowledge creation through R&D				
		Status of Venture Funding activity with appetite for South African Al investments				
	Data Availability	Status of government (Open-access/Open-source) and/or industry (Open-access/Open-source) datasets available for Al development				
	Al Solutions Availability	Status of Al-related government/industry APIs providing structured access to datasets available for Al development				
		Status of locally developed AI applications (specifically ML, LLMs, Local languages)				
		Status of GDP expenditure on digital infrastructure				
	Infrastructure	Status of GDP expenditure on Al-related initiatives (i e , projects;,digital infrastructure)				
7. Data and digital infrastructure	Investment	Status of energy spending on AI related initiatives (including infrastructure)				
		Status of spending on protection and safeguarding of Al-related initiatives (including infrastructure)				
		Status of data centers nationally				
	Infrastructure	Status of high performance computing clusters				
	amasaucture	Status of Al digital infrastructure				
		Status of total population with access to electricity				
8. Security and Privacy	Al Data and Security Breaches	Status of Al-related data and security breaches, as well as national capability to respond to data and security breaches				
	Adoption of Best Practice	Status of international best practice standards and practices in terms of cyber- security of AI ecosystem components.				

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