AI in Africa: The state and needs of the ecosystem

Executive Summary

March 2024

Sida IDRC · CRDI AI4D AFRICA G:ENESIS 25 YEARS OF UNLOCKING VALUE

EXECUTIVE SUMMARY

Africa has a modest share of the global AI market...

Current Annual Value of AI Market[1,2,3] *(Including Generative AI)*

~2.5% of the global AI market

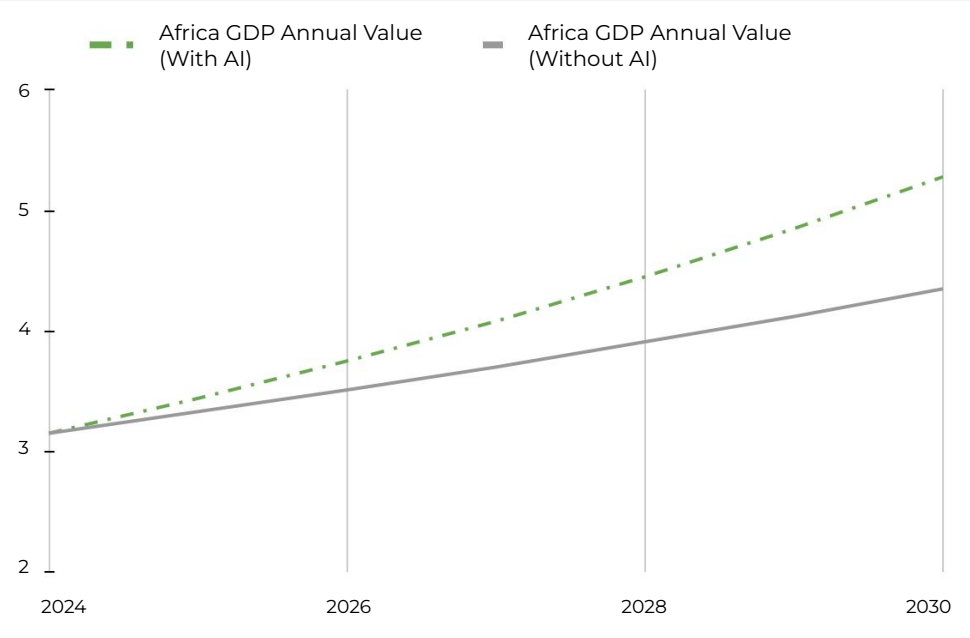
USD 0.4 Trillion
African AI Value (Annual)

See Methodology here

Source: PWC (2020) Sizing the Prize; Mckinsey (2023) Economic Potential of Generative AI; Genesis Analytics team analysis;

...but the value of AI to the continent is large

By 2030, AI could **add USD 2.9 trillion** in value to the African economy - the equivalent of **increasing annual GDP growth by 3%**



This boost to economic growth translates into significant development impacts for the continent

Number of Africans Raised out of Poverty Annually

~ 11 million

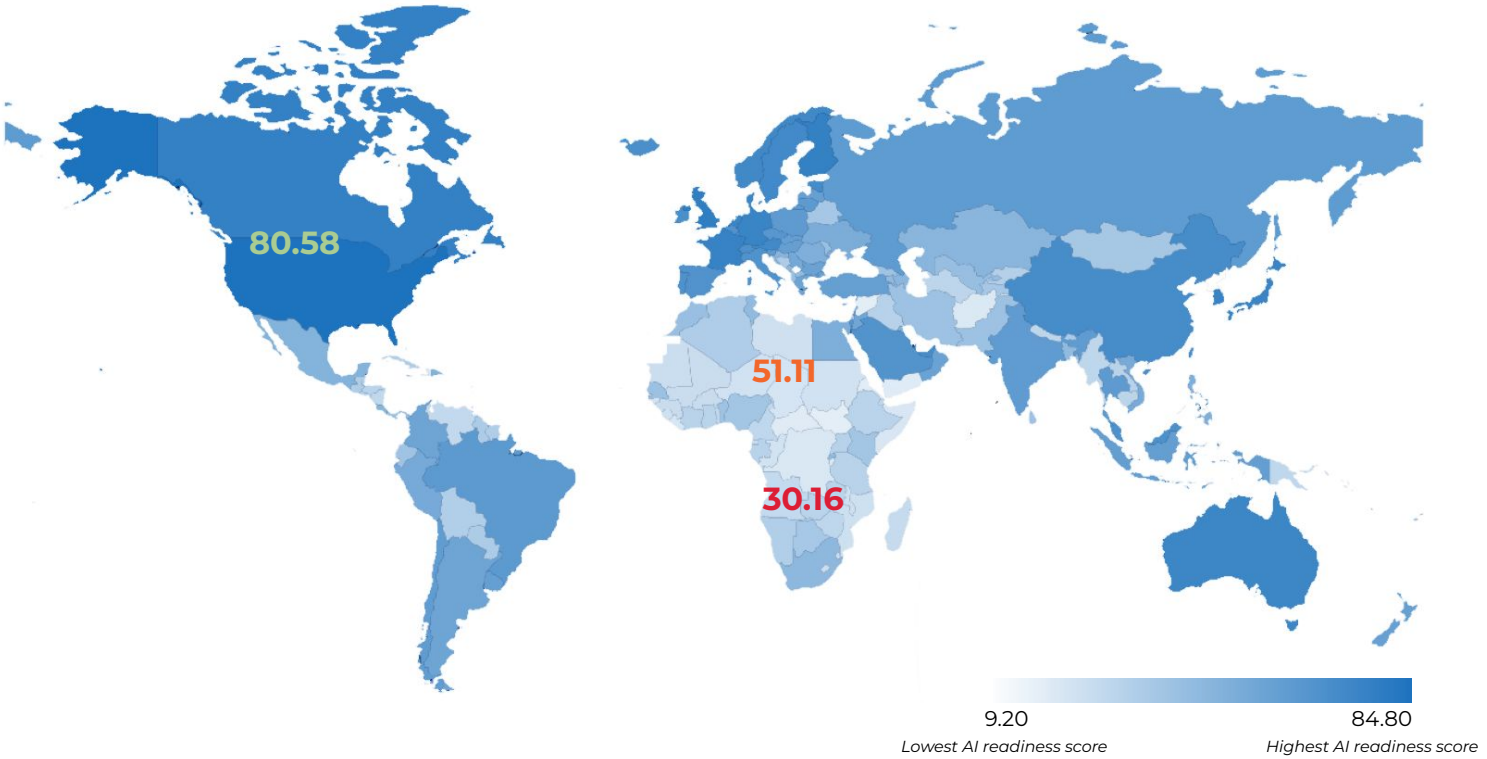
Number of Africans Employed Annually

~0.5 million

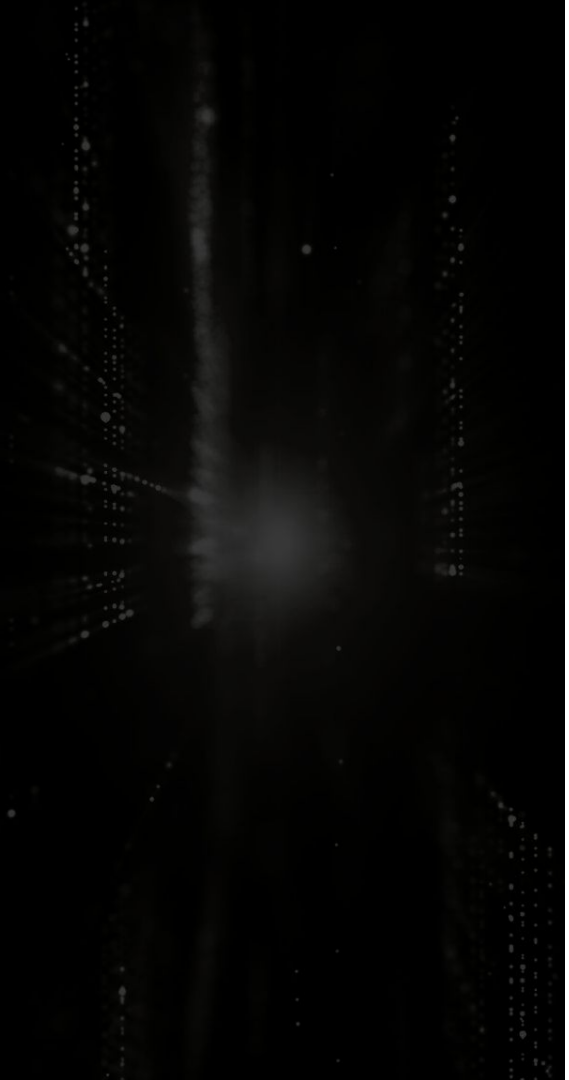
See Methodology here

Poor AI readiness on the continent hampers the potential application of this frontier technology for development

It is evident that **the continent lags behind global trends in AI readiness**

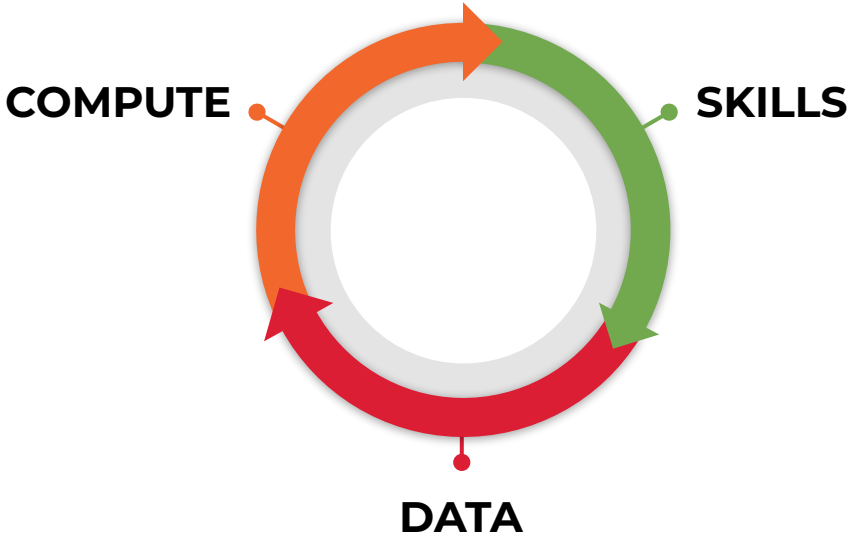


Source: Oxford Insights 2023. *Government AI Readiness Index*



Critical inputs into the AI ecosystem are modelled as a virtuous cycle

This pack explores three fundamental inputs, with the understanding that these sit within a broader enabling environment including policy and partnerships. We see skills and data as pulls for compute and compute availability and affordability as a push for increasing data and skills.



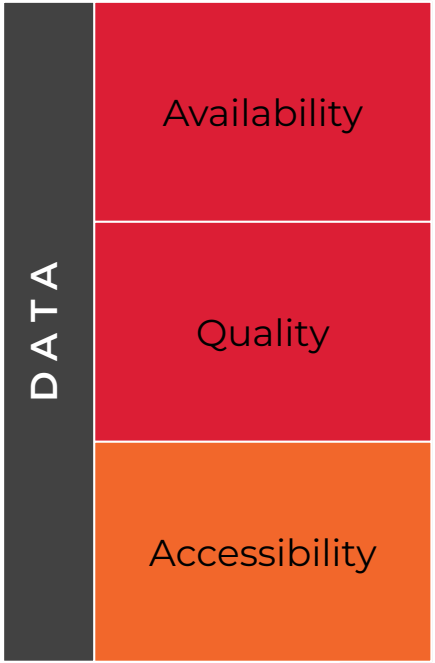
Our overarching method

We followed a five-step method:

1. Mapping the components of the pillar
    a. For example, the types of data required
2. Estimating the supply and demand for the different components across select African countries
3. Assessing the levels of supply and demand against benchmark countries
4. Identifying and quantifying the gaps
    a. Both internally and against benchmarks
5. Surfacing realistic solutions
    a. The solutions look at Impactful short-term strategies and more systemic, longer-term investments

High-level findings: Data

Critically constrained but quick wins to "good enough"



There are major gaps across all measures. The relative supply of African-specific data is a fraction of that of other regions. The data that does exist is not easily accessed and often not of required quality.

Despite the critical challenges, there are some quick wins to get the ecosystem to levels of "good enough". Parity of data availability and quality is a moonshot.

Critical constraint Gap to address Not an immediate issue

High-level findings: Skills

There should be a focus on where supply exists and on skills that pull demand

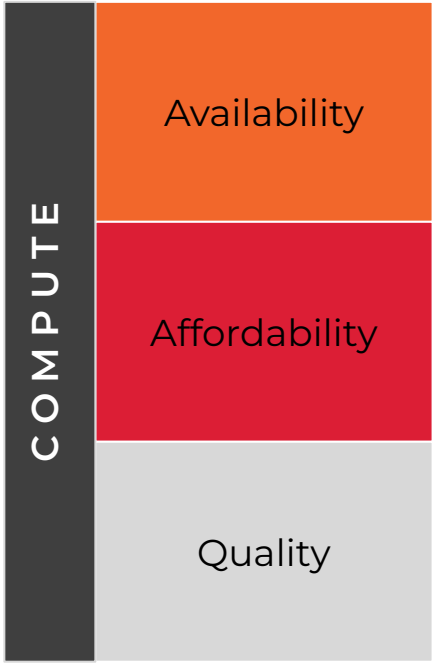
A major challenge is suppressed levels of demand for AI practitioners. Investing in higher education and advanced AI skills without investing in stimulating local demand for these skills will perpetuate the brain drain.

There is significant potential for employment at the “base of the pyramid”. Intermediary AI skills matter for stimulating demand and driving the maturity of the AI ecosystem.

Critical constraint Gap to address Not an immediate issue

High-level findings: Compute

Supply gaps and relative affordability are key constraints



Large-scale investments in compute are needed, primarily in cost-effective, highly scalable solutions

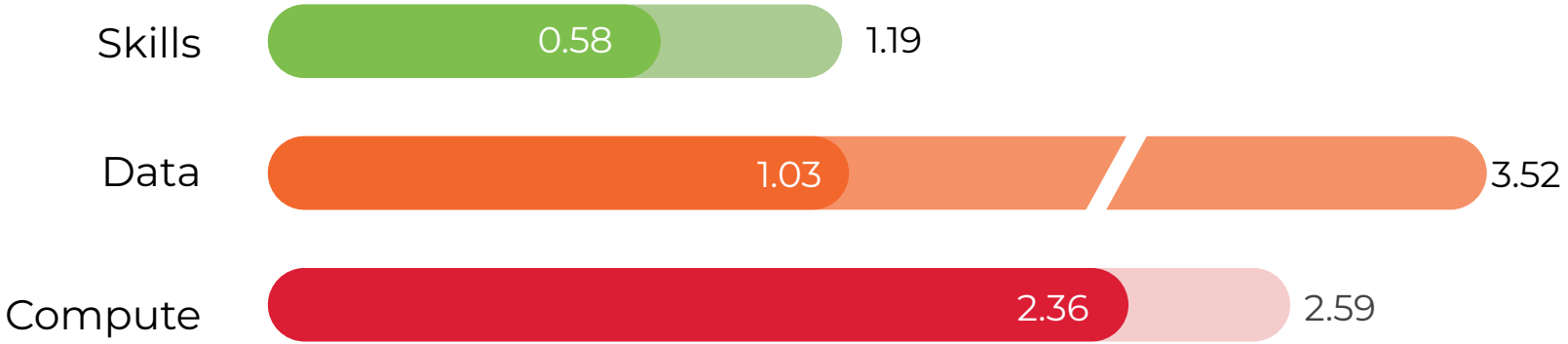
The absolute costs of compute are relatively similar across regions but when taken as a function of income levels, the costs of compute are high for African practitioners. This is a major barrier to scaled use and application of AI.

Critical constraint Gap to address Not an immediate issue

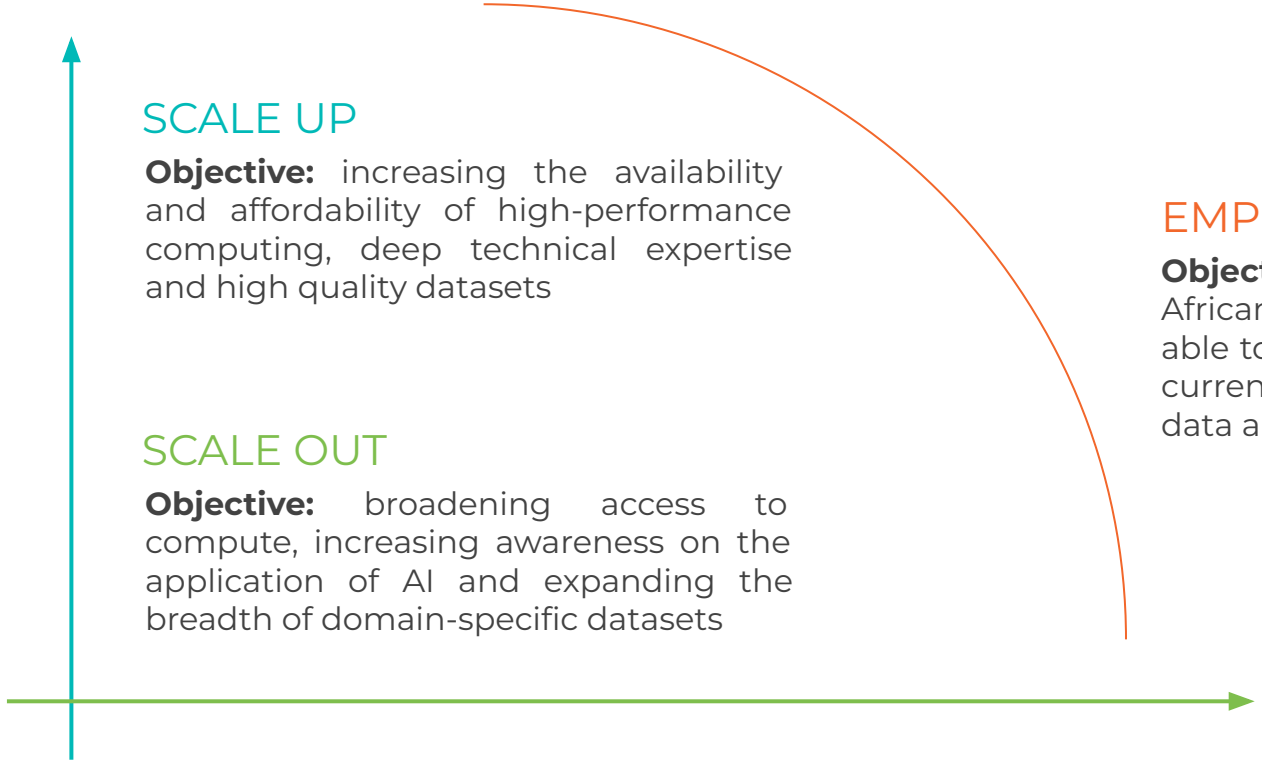
Large-scale investments are required to plug these gaps

The comprehensive investment needed for Africa to leverage AI effectively involves substantial funding for data collection, curation and storage, including robust data governance and security. Investments in high-performance computing resources and scalable cloud computing are crucial to seeing this data be used effectively. Investments in skilling cannot be disregarded, but should be viewed through the lens of employability and demand generation.

Estimated levels of investment required across pillars of the AI ecosystem ($, billions)



A framework for thinking about interventions



SCALE UP

Objective: increasing the availability and affordability of high-performance computing, deep technical expertise and high quality datasets

SCALE OUT

Objective: broadening access to compute, increasing awareness on the application of AI and expanding the breadth of domain-specific datasets

EMPOWER

Objective: supporting the African AI ecosystem to be able to achieve more given current status of compute, data and skills

Priority interventions

The other packs provide more details, but these are the priority because they provide the greatest potential for impact in the short-term.

COMPUTE

1. Provide credits and donating hardware
2. Accept local payment platforms and removing frictional barriers to use
3. Support the increased use of existing infrastructure
4. Invest in local and regional infrastructure

SKILLS

1. Encourage rotational contracts and apprenticeships
2. Generate AI business use cases
3. Scale platforms to connect and grow local talent
4. Develop centres of excellence in government

DATA

1. Establish a central platform for data sharing
2. Enhance existing data collection processes
3. Unlock safe access to existing and new sources of data
4. Demonstrate the value of federated learning
5. Address barriers preventing access to quality data

What is Big Tech already investing?

Organisation	Compute	Data	Skills	Other
Microsoft	Data centres in Cape Town and Johannesburg; Edge Nodes in Kenya, Nigeria and Egypt Airband Initiative aims to expand internet access to underserved areas and has reached over 9 million Africans to date	Microsoft Nonprofit Innovation Hub is an open-source GitHub repository They are also a partner and funder of the Industry Data for Society Partnership Contributed to Databricks' $500m series I Contributed to Typeface's $100m Series B, alongside Google and Salesforce Microsoft's Open Data Campaign and various grants support partnerships that prioritise open data	$100 million over 5 years on development centres which will employ 500 staff in the next five years, in Nairobi and Lagos Microsoft Africa Research Institute (MARI) in Kenya aiming to "understand, build and deploy cloud and AI" Aiming to provide digital skills to 30 million Africans over next three years, partnered with YES in South Africa to skill 300,000 South African youth	4Afrika Initiative is a multi-million dollar investment to accelerate digital transformation - focusing on supporting SMEs, skilling and innovation
AWS	AWS Region (3 Zones) in Cape Town and announcement of plans for one in Nairobi Project Kuiper is an initiative to increase connectivity through 3000+ satellites and is partnering with Vodafone to connect underserved communities across Africa and Europe	AWS has a registry of open data available via AWS resources Participated in Hugging Face's $235m Series D at a US$4b valuation, alongside Google, Nvidia and Salesforce Contributed to Databricks' $500m series I	Two Development Centres on the continent - Nairobi and Cape Town AWS Educate, covering several African countries, providing academics with resources AWS is partnering with Smart Africa to roll out AWS re/Start, a free-to-the-learner program across institutions in Ghana, Kenya, the Republic of Congo, and Côte d'Ivoire	AWS Health Equity Initiative is committing $40 million over three years in the form of credits and technical expertise to initiatives addressing health disparities

Google	Equiano cable, valued at $1billion - spanning 15,000 km from Portugal to South Africa, with two strategic landing points in Nigeria and Namibia. Project Link initiative: building links between undersea cables, ISPs and mobile networks. Google has committed an additional $100 million to boost its expansion into the African continent. Data centres and cloud region in Cape Town.	Google Dataset Search allows users to find available datasets. Participated in Hugging Face's US$235 million Series D at a US$4B valuation, alongside AWS, Nvidia and Salesforce. Invested in dbt Labs' $222m Series D, alongside Salesforce. Contributed to Typeface's $100m Series B, alongside Microsoft and Salesforce. Google Earth Engine provides access to a vast amount of satellite imagery and geospatial datasets.	Google have set up an AI research center in Accra. Google AI Accelerator is providing startups across 17 African countries with access to mentorship, technical skills and cloud credits. Google, partnering with Andela and Pluralsight, provides scholarships to African developers looking to advance their skills in Android, Google Cloud and other technologies.	In 2021, Google announced a plan to invest $1bn over the next five years to support Africa's digital transformation, across infrastructure and innovation. $1.5 million committed to Makerere University's healthcare innovations through Global Goals Impact Challenge. AI for Social Good drives research and innovation.
Meta	Meta's 2Africa - will circle the continent and connect 16 African countries, for an estimated cost of between $500m and $1bn.	Meta has made various large-scale datasets available for training and testing AI models. Their Data for Good programme shares protected datasets with trusted partners. Facebook, in collaboration with Columbia University's Center for International Earth Science Information Network, has been developing high-resolution population density maps using satellite imagery and census data. FAIR is Facebook's AI research division dedicated to advancing the state of AI through open research and collaboration, providing open-source AI models, frameworks, and datasets that can be used to improve natural language processing, computer vision, and other AI fields.		Facebook Free Basics, which allows users to access basic content on the apps for free, is present in most African countries.

Nvidia	Invested $147m in Arm Holdings, which helps with the design and development of advanced computing chips for semiconductor companies. Invested in Ayar Labs, which specialises in chip-to-chip connectivity to solve for bandwidth and power bottlenecks.	Nvidia invested in Databaricks' $500m Series I, followed by participation by Amazon and Microsoft. Participated in Hugging Face's $235m Series D. Invested in SoundHound AI, which develops voice recognition and conversational AI technologies. Invested in Nano-X Imaging, which uses AI to improve the efficiency of medical imaging to help patients achieve better outcomes.	Nvidia Training Program provides organisations access to collaborative skills development, providing developers in training with GPU access in the cloud, and software engineers and data scientists with hands-on experiences with the latest Nvidia frameworks, tools, SDKs and services.	
Huawei	Huawei has committed $200m to set up the first public cloud centre to service Northern Africa, offering more than 200 cloud services. Huawei has partnered with South African data centre operator Teraco to provide cloud services in Sub-Saharan Africa. Approximately 50% of Africa's 3G networks and 70% of the 4G networks were built by Huawei (Hruby, 2021).		Huawei ICT Academy operates across several countries and partners with tertiary institutions to build ICT skills. Their Seeds for the Future Programme similarly aims to develop local ICT talent. $30m has been committed to train 10,000 software developers and educate 100,000 digital professionals in Northern Africa.	$200m was pledged by Huawei to support software providers and channel partners in the region.

Source: 1. LinkedIn. 2023.. 2. The Motley Fool. 2024. 3. Nvidia. 2024.

APPENDIX

Methodology

Slide 3: Africa's Share of the AI Market

- Global Market value calculated using PwC and McKinsey reports
- Africa's share of global GDP is estimated at 2.5%
- Africa's fair share of the AI market valued using Africa's share of global GDP
    - $16.5 trillion x 2.5% = $0.4 trillion

Slide 4: The value of AI to the continent

- Linear growth has been assumed
- Africa's GDP without AI is grown by the expected GDP growth rate of 5.5%
- Africa's GDP with AI includes $0.4 trillion annually as Africa's estimated share of the AI market
- Poverty reduction calculations use an AfDB statistic that for every 1% change in GDP, there is a 0.74% reduction in poverty levels. This is multiplied by the number of people living in poverty (1.25 USD daily) and the expected increase in GDP growth due to AI.
    - 0.74% x 3.5% x ~410 million = ~11 million
- A similar methodology has been utilised for changes in employment
    - 0.46% X 3.5% x ~31.5 million = ~0.5 million

Quantifying the size of the investments

Please refer to the supplementary packs for detailed methodologies.