Leapfrogging

Artificial Intelligence (AI) and Leapfrogging Potential in Africa

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Artificial intelligence (AI) is a branch of computer science dedicated to creating systems capable of performing tasks that typically require human intelligence. Although the concept dates back to the 1950s, AI capabilities have improved significantly in recent years due to the availability of massive amounts of data, better training data and more powerful computer hardware.

For instance, the global adoption of generative AI (GenAI), such as ChatGPT and CoPilot, has far outpaced previous technologies. While it took decades for inventions like the telephone (75 years), cars (33 years) and even the internet (7 years) to reach 100 million users, ChatGPT achieved this milestone in just two months. By June 2025, hundreds of AI tools were in use, with the top 60 attracting nearly 6 billion monthly visits. However, adoption remains uneven: by April 2025, 24% of internet users in high-income countries used ChatGPT, compared to just 5.8% in upper-middle-income countries, 4.7% in lower-middle-income countries and 0.7% in low-income countries.

AI represents the next frontier of technological leapfrogging in Africa, building on the continent's rapid expansion of mobile and digital connectivity. With a growing digital ecosystem, favourable demographics and increasing data availability, Africa is well- positioned to harness AI to accelerate development.

The economic potential is substantial. More recent analysis by the African Development Bank indicates that inclusive AI deployment could generate as much as US$ 1trillion in additional GDP by 2035, nearly one-third of the continent's current economic output, positioning AI as a major driver of productivity, economic growth and job creation across the continent. These gains are expected to be concentrated in high-impact sectors such as agriculture, retail, manufacturing, finance and healthcare, where AI can significantly enhance productivity and service delivery.

AI's leapfrogging potential lies in its ability to bypass traditional constraints. In contexts where access to high-quality education, healthcare or extension services is limited, AI-powered tools can deliver low-cost, scalable solutions. For example, AI-enabled advisory systems can provide farmers with real-time guidance on crops, weather and market conditions, improving productivity and resilience. Similarly, AI applications in healthcare and education can expand access to diagnostics, personalised learning and decision support, particularly in underserved and remote areas. Beyond these sectors, AI can also help strengthen defence and security capabilities, particularly in surveillance, intelligence and decision-making, without going through costly traditional stages.

Importantly, AI can also help overcome some of the structural barriers that have limited internet use in Africa. Pilot studies show that AI-based tools, such as chatbots accessible on basic mobile platforms, can deliver relevant information more efficiently and at significantly lower data costs than traditional web searches. This makes AI particularly well-suited to low-connectivity environments, where affordability and data constraints remain major barriers to digital inclusion.

A particularly promising area is public sector transformation, especially in tax administration. In South Africa, for example, artificial intelligence is significantly enhancing tax compliance through the work of the South African Revenue Service (SARS), which has adopted data-driven technologies to modernise its operations. By integrating vast datasets from employers, financial institutions and other third parties, SARS uses AI and advanced analytics to automatically detect discrepancies, identify high-risk taxpayers and prioritise audits with greater precision. These systems rely on techniques such as predictive analytics, data matching and pattern recognition to uncover previously hidden forms of tax evasion, while also enabling the pre-population of tax returns and real-time compliance monitoring. As a result, AI is shifting the tax system from reactive enforcement to proactive compliance, improving efficiency, reducing fraud and strengthening revenue collection.

These innovations highlight the AI leapfrogging potential in Africa. Many countries on the continent face similar challenges

in tax collection, including informality, limited administrative reach and weak data systems. By adopting AI-enabled solutions, African governments can bypass slower, traditional reforms and move directly to more efficient, data-driven systems. This can significantly enhance domestic revenue mobilisation, which is critical for financing development priorities.

However, realising this potential depends on addressing key enabling factors. These include access to data, computing infrastructure, digital skills, investment and regulatory frameworks. While adoption is growing, more than 40% of African institutions have begun experimenting with AI, deployment remains uneven across countries and sectors. Significant gaps persist in infrastructure, education and governance, which risk widening existing inequalities if not carefully managed.

A growing number of continental initiatives are already emerging to operationalise this potential. Notably, the African Development Bank Group and the United Nations Development Programme (UNDP), through the AI Hub for Sustainable Development, have launched the AI 10 Billion Initiative, a major effort to accelerate responsible AI adoption and inclusive digital growth across Africa. Announced at the Nairobi AI Forum 2026, the initiative aims to mobilise up to US$10 billion by 2035 to support investments in AI infrastructure, entrepreneurship, policy frameworks and skills development. By focusing on building foundational enablers and scaling practical applications, the initiative seeks to unlock up to 40 million jobs while ensuring that AI-driven transformation is anchored in trust, local value creation and broad-based development impact.

Looking ahead, AI could act as a powerful general-purpose technology, amplifying the benefits of earlier digital investments in mobile and broadband networks. As connectivity expands and electricity access improves, AI systems can be deployed more widely to support innovation across sectors. When combined with investments in human capital, local innovation ecosystems and inclusive policies, AI has the potential to enable Africa not only to catch up but in some areas to leap ahead, driving productivity, creating new industries and supporting more inclusive and sustainable development.

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Dr Jakkie Cilliers is the founder and former executive director of the ISS. He currently serves as chair of the ISS Board of Trustees, head of the African Futures and Innovation (AFI) programme at the Institute's Pretoria office, and an extraordinary professor at the University of Pretoria. His 2017 best-seller Fate of the Nation addresses South Africa's future from political, economic and social perspectives. His three most recent books, Africa First! Igniting a Growth Revolution (March 2020), The Future of Africa: Challenges and Opportunities (April 2021), and Africa Tomorrow: Pathways to Prosperity (June 2022) offer rigorous analyses of the continent as a whole. From August to December 2025, Cilliers was a Richard von Weizsäcker Fellow at the Robert Bosch Academy in Berlin.

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