REPUBLIC OF KENYA

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1. Executive Summary

Kenya's AI Strategy in the Era of Globalization and Digital Transformation

In an age defined by accelerating globalization and the rapid evolution of artificial intelligence, Kenya's strategic embrace of AI marks a pivotal shift in its national development trajectory. By embedding AI into its digital transformation agenda, Kenya is not only reshaping her economic growth model but also offering replicable frameworks for other emerging economies navigating similar transitions. This report provides a comprehensive overview of Kenya's digital economy and AI landscape and development goals highlighting recent progress in policy formulation, infrastructure modernization, public service innovation, and sectoral digital transformation while outlining forward-looking goals and implementation pathways of the AI Strategy 2025–2030.

Kenya's Emerging Leadership in Bridging Africa's AI Divide

As Africa's leading technology and innovation hub, Kenya is uniquely positioned to leverage AI for inclusive development. With world-class mobile broadband penetration, pioneering mobile financial services, and expanding ICT infrastructure, the country has built a strong foundation for digital innovation. According to Business Monitor International (BMI), Kenya's ICT sector has grown at an average annual rate of 10.8% over the past decade. By 2025, the digital economy is projected to contribute 9.24% of GDP, with estimates suggesting it could exceed 30% by 2030. Artificial intelligence is expected to be a key driver of this transformation — unlocking efficiencies, enabling new services, and opening pathways for sustainable growth across sectors.

Strategic Integration of AI Within Kenya's Policy Ecosystem

The Kenya AI Strategy 2025–2030 is not a standalone initiative; it is a direct operationalization of the country's broader digital transformation agenda. Anchored in the Kenya Digital Vision 2030, which articulates the national ambition for a digitally empowered society, the strategy draws structural guidance from the Digital Economy Blueprint — particularly its pillars on infrastructure, innovation, and skills development. The Bottom-Up Economic Transformation Agenda (BETA) translates these digital enablers into inclusive sectoral interventions, targeting agriculture, health, MSMEs, and manufacturing. The AI Strategy serves as a cross-cutting accelerator, embedding AI

into both the foundational architecture of the Blueprint and the delivery mechanisms of BETA. Together, these frameworks form a coherent policy stack in which AI is both a product of strategic planning and a catalyst for inclusive growth, institutional modernization, and global competitiveness.

Implementation Roadmap: Priorities for Kenya's AI Strategy 2025–2030

While the Kenya AI Strategy 2025–2030 sets forth ambitious goals and a clear strategic direction, its successful execution will require overcoming significant challenges — including legacy infrastructure limitations, fragmented data ecosystems, and constrained institutional capacity. To ensure the strategy delivers on its promise and achieves the broader objectives of Kenya's Digital Vision 2030, a robust and future-ready implementation roadmap is essential. This roadmap must build on legacy ICT Infrastructure, existing digital assets, adopt cutting-edge technologies, and align with global best practices. **Five strategic actions have been prioritized** to form the backbone of this coordinated execution framework:

1. Build an Advanced Digital Infrastructure for AI Readiness (Toward 2030)

Establish a resilient, high-performance digital backbone encompassing national compute capacity, cloud infrastructure, and advanced connectivity to support AI research, large-scale model training, and commercial deployment. This includes expanding access to edge computing nodes, modern data centres, fiber-optic and IP broadband networks, as well as 5G wireless coverage across sectors and regions

2. Establish a Secure and Controllable Dataset & Large Language Model (LLM) Ecosystem

Develop trusted the data governance frameworks and national foundational datasets to support the development of locally relevant AI models. Promote transparency, privacy, and accountability in LLM development, ensuring alignment with ethical standards and public interest.

3. Prioritize Deployment of Critical Business and Public Sector Applications

Accelerate the integration of AI into high-impact domains including agriculture, healthcare, education, tourism services, and public administration. Emphasize use cases that generate measurable socio-economic value and enhance service delivery for both citizens and businesses. Moreover, successful achievements in these pilot initiatives will build confidence and encourage broader adoption across society and industry, fostering momentum for large scale digital transformation.

4. Establish a Robust and Sustainable AI Innovation Ecosystem

Foster a dynamic ecosystem that brings together startups, research institutions, private sector actors, and government agencies. Provide targeted support through dedicated funding, talent cultivation, tailored solution incubation, and strengthened international collaboration. These measures will accelerate innovation, scale adoption, and enable the ecosystem to mature rapidly into a sustainable driver of national digital transformation.

5. Promote Agile Governance and an Inclusive Development Culture

Implementing an adaptive regulatory framework, ethical oversight mechanisms, and inclusive stakeholder engagement processes allows for continuous optimization and iterative development based on ongoing practical testing and societal consensus. This ensures that the development of artificial intelligence can accurately reflect Kenya's values in real-time, protect citizens' rights, and promote equitable access to development opportunities across society

This comprehensive and targeted implementation roadmap is designed to ensure the smooth and systematic execution of Kenya’s AI Strategy for 2025–2030. Its overarching goal is to position Kenya as a leading hub for AI development in Africa by 2030, while driving successful digital transformation across key industries and advancing the nation’s transition toward newly industrialized status.

2. Global AI-Centric Digital Economy Development outlook

2.1 Global Trends:

Strategic Overview: AI as the Engine of Digital Economic Growth：

The global digital economy is undergoing a profound transformation, with Artificial Intelligence (AI) emerging as its strategic nucleus driving productivity, innovation, and cross-border integration. As the defining force of this new era, the AI-driven digital economy is **reshaping both societies and global markets by accelerating productivity, transforming labour structures, and redefining governance models**. It represents a powerful growth engine and a disruptive force, requiring deliberate policy frameworks to ensure inclusivity, resilience, and stability.

According to the Global Artificial Intelligence Report (2025)[1], published by the International Data Centre Authority (IDCA), AI has become a top business priority worldwide. The report notes that **87% of companies now identify AI as central to their strategies, while 76% are actively deploying AI solutions across core functions**. Beyond adoption rates, the report underscores the transformative role of generative AI, agentic AI, and AI sovereignty in shaping digital economies and enhancing global competitiveness. These dimensions highlight not only the technological potential of AI but also its geopolitical and economic significance in determining future leadership within the digital economy.

Global Trends: Defining the AI-Centric Digital Economy:

1. Platformization and Value Creation

- Over the next decade, more than two-thirds of new global economic value is expected to originate from digitally enabled platforms, many of which are powered by AI.
- These platforms are transforming traditional business models by enabling real-time commerce, decentralized finance, and intelligent supply chains.

[1] Data source: https://www.idc-a.org/insights/0bKr4NJQdK5sYcAQaGZD

2. AI-Driven Inclusion and Global Trade

- AI is narrowing digital divides by providing low-cost access to financial services, education, and healthcare in emerging markets.
- International organizations are advancing global AI standards to ensure equitable participation in digital trade and inclusive growth.

3. Generative AI and Knowledge Economies

- Generative AI is transforming content creation, software development, and customer engagement.
- It is also accelerating the shift toward knowledge-based economies, where intellectual capital and data-driven insights are key assets.

4. Big Data Synergy and Predictive Intelligence

- AI is increasingly used to extract strategic insights from vast datasets, enhancing decision-making in sectors like finance, logistics, and public health.
- Today**, 53% of organizations** now use AI to harness Big Data effectively, enabling predictive modeling and scenario planning.

5. Digital Trust and Governance

- The rise of AI necessitates robust data governance, cybersecurity, and ethical frameworks.
- Governments and multilateral organizations are investing in AI literacy, regulatory sandboxes, and cross-border data protocols.

6. Policy and Infrastructure Enablers

- The Digital Economy Trends 2024 report emphasizes the need for interoperable digital infrastructure, inclusive digital ID systems, and AI-ready workforce development.
- Strategic investments in cloud computing, edge AI, and 5G are foundational to sustaining AI-driven growth.

The AI-driven digital economy is **not just a technological shift, it is a structural transformation of economies and societies**. Countries that invest in digital infrastructure, inclusive policies, and responsible AI governance will capture growth while mitigating risks. For Kenya and Africa, this means positioning AI as both an enabler of productivity and a tool for inclusive development.

2.2. Global Cases Studies

2.2.1. United States

The U.S. government launched a comprehensive **AI Action Plan** in 2025 to accelerate national leadership in artificial intelligence across innovation, infrastructure, and global diplomacy. Here's an overview of the key initiatives:

U.S. America's AI Action Plan 2025[2]

Unveiled by the White House in July 2025, the **AI Action Plan** outlines over **90** federal policy actions across **three** strategic pillars:

1. Accelerating Innovation：

- **Removing regulatory barriers** to AI deployment in critical sectors like healthcare, manufacturing, and finance.
- **Investing in AI-enabled science**, including funding for AI in climate modeling, biomedical research, and advanced materials.
- **Supporting open-source and open-weight AI models** to foster transparency and innovation.
- **Empowering American workers** through AI upskilling programmes and workforce transition support.

2. Building American AI Infrastructure：

- **Developing world-class scientific datasets** to train robust and diverse AI models.
- **Expanding cloud and edge computing capabilities** to support real-time AI applications.
- **Investing in AI interpretability, control, and robustness,** ensuring systems are safe, explainable, and aligned with human values.

3. Leading in International Diplomacy and Security：

- **Exporting secure AI packages** including hardware, models, and standards—to allied nations.
- **Establishing global AI norms** through diplomatic channels and multilateral forums**.**
- **Protecting free speech and American values** in frontier AI systems deployed abroad.

[2] Data source: The Official Website of The White House's official publication

Moreover, As the greatest AI project worldwide, the U.S. "**Stargate**" project[3] represents **a landmark initiative in AI infrastructure**, launched in 2025 with the backing of OpenAI, SoftBank, Oracle, and MGX. With plans to invest up to $500 billion by 2029, the project is designed to establish American leadership in artificial intelligence, catalyze economic growth, and reinforce national security. As one of the most ambitious technology projects of its kind, Stargate underscores the strategic importance of AI as the **backbone** of the future **digital economy**.

2.2.2. Germany

Germany is accelerating its AI development through a €5.5 billion national strategy[4] focused on innovation, infrastructure, and industrial transformation with a goal for **AI to contribute 10% of GDP by 2030,** and here's a general overview of Germany's current AI initiatives:

1. Germany's National AI Strategy (2025 Update) [5]

Announced in July 2025, Germany's updated AI strategy reflects a bold commitment to global competitiveness and domestic modernization. The plan is backed by the **Federal Ministry of Education and Research (BMBF)** and includes:

- **€5.5 billion** in funding through 2030
- Target for AI to contribute **10%** of national GDP
- Focus on machine vision, industrial automation, and AI talent development

2. Industrial AI and Machine Vision Leadership

Germany is leveraging its strength in advanced manufacturing by embedding AI into:

- Automotive assembly lines
- Robotic inspection systems
- Smart factories and predictive maintenance

Machine vision powered by AI's capacity to interpret the physical world stands at the core of this strategy, strengthening Germany's global **leadership** in **precision engineering** and **industrial robotics.**

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[3] Data source: https://en.wikipedia.org/wiki/Stargate_LLC

[4] Data source: https://www.euronews.com/business/2025/11/12/google-bets-55-billion-on-germanys-ai-future

[5] Data source: The National AI Strategy – Germany (OECD) from the website of OECD.AI

3. Government Modernization Agenda

The government cabinet launched a broader **"Modernization Agenda"** that integrates AI into public services and governance in 2024:

- **25% reduction** in bureaucracy costs by 2029
- AI-powered visa processing and document review
- **Online platforms** for export businesses, bundling regulatory and credit information
- AI integration in courts and administrative systems

4. Ethics, Standards, and Global Engagement

Germany continues to advocate for:

- **AI ethics and transparency**
- **European AI standards**
- **Cross-border collaboration through the EU and global forums**

These efforts aim to balance innovation with democratic values and regulatory oversight.

2.2.3. China

China has adopted a comprehensive, deployment-focused approach to artificial intelligence, positioning AI as a cornerstone of national competitiveness, industrial modernization, and global influence. The following initiatives reflect the country's commitment to scaling AI across sectors with precision and purpose.

1. National Strategic Framework definined by "AI Plus"

Launched in August 2025, the "AI Plus" initiative[6] embeds artificial intelligence across six domains: scientific research, industrial development, consumer services, public well-being, governance, and global cooperation. Together, these pillars position AI as a driver of productivity, innovation, and international influence.

2. Targets by 2027 include:

- **70%** penetration of intelligent terminals and AI agents
- Significant expansion of core intelligent economy sectors

[6] Data source: The website of the State Council of the People's Republic of China

- Broad adoption of AI in public administration and diplomatic functions

3. Updated National AI Strategy

China's revised AI strategy emphasizes:

- **Regulatory modernization:** Introduction of new laws governing AI safety, transparency, and ethical deployment.
- **Infrastructure investment:** Expansion of computing capacity, data ecosystems, and model training platforms.
- **Global leadership:** Strategic export of secure AI systems and active participation in multilateral AI governance.

4. Industrial Empowerment

AI is transforming China's industrial base via:

- Smart factories with autonomous robotics and machine vision
- Predictive maintenance and real-time optimization of production lines
- Integration of AI with carbon-neutral and digital infrastructure goals

These efforts align with China's vision to lead in intelligent manufacturing and industrial AI applications.

5. Public Sector Modernization

AI deployment enhances government services, including:

- AI-assisted healthcare diagnostics and hospital management
- Smart city platforms for traffic, utilities, and emergency response
- Automated legal and administrative processes, such as visa approvals and document verification

6. AI Infrastructure Implementation

- **National Computing Power Network**: A grid of interconnected data centres optimized for AI workloads, linking eastern data sources with western compute clusters.
- **Super-scale AI Infrastructure**: Facilities designed for training large language models (LLMs), supporting generative AI, and enabling real-time analytics.
- **Green Energy Integration:** Western data centres are powered by renewable energy (wind, solar, hydro), with massive energy storage systems to ensure stability and sustainability

- **Specific Initiative:** The "**East Data, West Computing**"[7] initiative balances data resources and computing power by building a massive integrated network of data centres. It was launched in 2022 and means: 1) **Eastern regions** (like Guangdong, Jiangsu, Zhejiang) generate huge volumes of data due to dense populations and advanced industries. 2) **Western regions** (such as Inner Mongolia, Gansu, Guizhou) have abundant land, renewable energy, and lower costs, making them ideal for large-scale data centres.

This strategy supports China's AI strategy goals by building a distributed, high-performance computing network that powers large-scale model training, smart city platforms, and industrial AI applications.

2.2.4. Singapore

Singapore's government is advancing AI development through its National AI Strategy 2.0, focusing on inclusive growth, trusted AI systems, and enterprise transformation backed by targeted programmes and cross-sector deployment.

1. Singapore's National AI Strategy 2.0[8]

Unveiled by the Ministry of Digital Development and Information (MDDI), Singapore's updated AI strategy builds on its Smart Nation vision and emphasizes:

- **Inclusive innovation**: Ensuring AI benefits all citizens and sectors
- **Trust and governance**: Promoting ethical, transparent, and secure AI systems
- **Real-world impact**: Accelerating AI adoption in business, public services, and daily life.

2. Business and Industry Transformation Focus

In March 2025, the Ministry of Digital Development and Innovation (MDDI) launched a series of new AI initiatives designed to accelerate business productivity and drive innovation. These initiatives target key focus areas, positioning AI as a catalyst for transforming industries and strengthening competitiveness across the economy.

- **SMEs:** Helping smaller firms adopt AI tools for efficiency.

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[7] Data source: The https://www.premia-partners.com/insight/china-s-east-data-west-computing-initiative-power-infrastructure-as-the-next-big-thing-in-the-global-ai-race

[8] Data source: The website of the Smart Nation of the Singapore

- **Healthcare & Education**: Embedding AI to improve service delivery.
- **Manufacturing & Logistics**: Using AI for predictive maintenance and supply chain optimization.

3. Global AI Leader Positioning

- Singapore aims to be a global leader in AI governance and innovation, actively participating in international AI standards and collaborations.
- The country sees itself as a testbed for responsible AI deployment, balancing innovation with ethics and inclusivity.

Moreover, the one of the biggest projects recently implemented by Singapore's government is the **Enterprise Compute Initiative**[9], the detail is as below:

- **Strategic Investment**: Announced in Budget 2025, Singapore allocated S$150 million to help enterprises access AI tools, cloud computing resources, and consultancy services.
- **Enterprise Enablement**: The program supports both SMEs and larger firms in adopting ready-made AI solutions (e.g., analytics, digital marketing), with a pathway toward custom AI systems integrated into core operations.
- **National Impact:** Designed to boost productivity, enhance competitiveness, and accelerate AI adoption across industries, reinforcing Singapore's position as a leader in digital transformation.

Singapore's AI roadmap positions the country as **a regional leader in ethical, inclusive, and enterprise-ready AI**, with strong alignment between government, industry, and academia. These efforts are designed to make Singapore **a global AI hub**, and **becoming one global leader** in ethical, inclusive, and enterprise-ready AI with strong alignment between government, industry, and academia.

[9] Data source: The https://www.edb.gov.sg/en/business-insights/insights/singapore-budget-2025-more-support-for-singapore-firms-to-tap-ai-solutions-financing.html

2.2.5. India

India's AI development strategy is anchored in the National Strategy for Artificial Intelligence (released by NITI Aayog in 2018) and expanded through the IndiaAI Mission (2025)[10]. Together, they outline India's vision **to harness AI for inclusive growth, sectoral transformation, and global leadership.**

India's biggest AI project since releasing its National AI Strategy is the IndiaAI Mission, launched in 2025. It is a multi-billion-dollar initiative designed to build world-class AI infrastructure, develop indigenous foundational models, and support startups while ensuring responsible AI use

1. **IndiaAI Mission – Flagship Project**

- **Funding & Scale**: The Government of India committed **USD 1.25 billion** over five years to this mission.
- **Infrastructure**: Establishing a national AI compute facility with **34,000+ GPUs**, making India one of the largest AI compute hubs globally.
- **Foundational Models**: Developing India's own large language and multimodal AI models, comparable to ChatGPT, tailored for Indian languages and contexts.
- **Startup Ecosystem**: Supporting 900+ AI startups, with funding, mentorship, and access to compute resources.
- **Market Growth**: India's domestic AI market is projected to reach USD 7.8 billion by 2025, driven by this mission.

2. **Voluntary AI Governance Framework 2025**

India's upcoming AI policy emphasizes **innovation-friendly regulation**. Key features include:

- **Voluntary compliance** to avoid stifling emerging technologies
- **Mandatory safeguards** against deep fakes and synthetic media (e.g. watermarking protocols)
- **Platform accountability** for harmful content moderation
- **Global alignment** of standards for high-risk AI systems

This approach aims to balance **safety, openness, and global interoperability**.

[10] Data source: https://indiaai.gov.in/

3. Sectoral AI Projects

Beyond the IndiaAI Mission, the government has rolled out AI pilots in key sectors identified in the original National AI Strategy (2018):

- **Healthcare:** AI for diagnostics, hospital management, and telemedicine
- **Agriculture:** Precision farming, crop prediction, and supply chain optimization
- **Education:** AI-enabled personalized learning platforms and AI-assisted assessments
- **Governance:** Smart public services and administrative automation
- **Smart Cities:** AI for traffic management, surveillance, and urban planning**.**

The IndiaAI Mission marks the Government of India's most significant initiative since its National AI Strategy. It integrates large-scale GPU infrastructure, indigenous foundational model development, and targeted startup support to position India as a rising global AI powerhouse. India's approach is **inclusive** and **bottom-up** empowering startups, students, and public institutions to democratize access to advanced AI while reinforcing national digital sovereignty. This framework accelerates domestic innovation and secures India's role as a meaningful global contributor to the future of AI.

3. Kenya's AI Development Outlook

3.1 Current Situation

Kenya is widely **recognized as Africa's leading technological and innovation hub**, positioned at the forefront of mobile broadband connectivity, mobile financial services, and robust ICT infrastructure. According to Business Monitor International (BMI), the country's ICT sector has expanded at an average annual rate of 10.8% over the past decade. By 2025, Kenya's digital economy is projected to contribute nearly **9.2%** of national GDP, with estimates from Smart Africa suggesting this share could rise to more than **30%** by 2030. Artificial Intelligence (AI) is expected to be a key driver of this transformation, accelerating progress across critical development sectors.

To realize this vision, the Government of Kenya **has launched the Kenya Artificial Intelligence Strategy 2025–2030**, which identifies infrastructure, data ecosystems, and innovation as foundational pillars. Advancing these domains is intended to spur economic growth, improve public service delivery, expand digital inclusion, and strengthen national sovereignty in cybersecurity and data governance.
At the continental level, Africa remains one of the fastest-growing regions globally, propelled by economic dynamism, expanding mobile connectivity, and a burgeoning digital economy. Yet, **significant gaps in AI readiness persist**. The 2024 Government AI Readiness Index, published by Stanford University, highlights disparities in institutional capacity, data infrastructure, and policy frameworks that hinder scalable AI deployment.

Kenya, despite its leadership role in Africa, **scored 44 points and ranked 93rd globally in AI readiness**. This underscore both the progress achieved and the challenges that remain when compared to more advanced nations. Addressing these gaps will be critical for Kenya to fully harness AI as a transformative force in its digital economy.

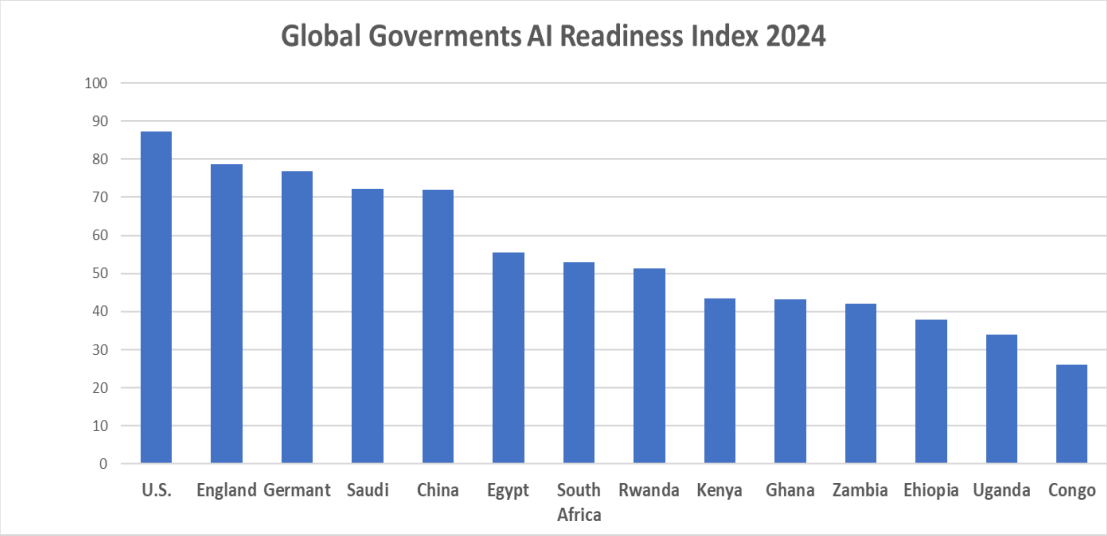

Figure 3.1. Government AI Readiness Index 2024 from Stanford University

The above figure indicates that Kenya's current ranking in global AI readiness falls short of the government's strategic targets. At the same time, the country faces several challenges that must be addressed to close this gap.

- **Infrastructure Limitations**: Digital access remains uneven, particularly in rural areas. Many regions lack reliable electricity and high-speed internet—essential for AI deployment.
- **Data Ecosystem Challenges**: Sectoral data is often fragmented, incomplete, and inconsistent, hindering interoperability and the development of robust AI models.
- **Talent and Skills Gap**: There is a shortage of skilled AI professionals, limited access to advanced training programmes, and insufficient research funding—all of which slow progress.
- **Ethical and Regulatory Concern**s: Clear policies and ethical guidelines are needed to prevent misuse, bias, and discrimination. Balancing innovation with human privacy remains an ongoing challenge.
- **Multi-Stakeholder Coordination:** AI success depends on collaboration across government, academia, industry, and civil society. Fragmented efforts risk inefficiency, duplication, and missed opportunities.

3.2 Kenya AI Strategy 2025-2030

To address these challenges and advance its ambition of becoming Africa's leading AI powerhouse, the Kenyan government launched the Kenya Artificial Intelligence Strategy 2025–2030 in March 2025. The strategy seeks to position Kenya as a premier hub for AI model innovation, with a focus on tailoring solutions to local needs through strengthened governance, innovation, and capacity building. Central to this vision is Kenya's commitment to promoting equitable and sustainable AI applications, ensuring that the benefits of this transformative technology are accessible to all citizens. Achieving this goal will require a collective effort from government, industry, academia, and civil society to solidify Kenya's role as a dedicated leader in AI development.

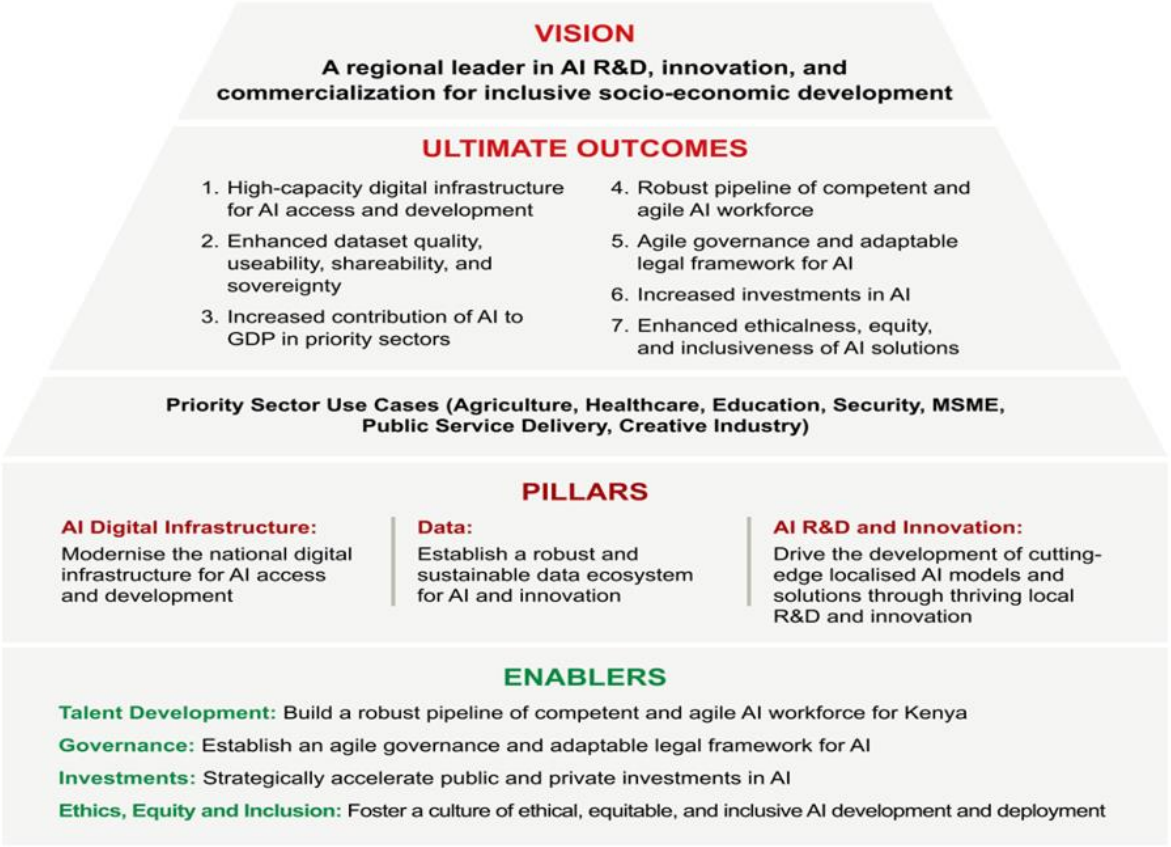

Figure 3.2. The Framework of Kenya AI Strategy 2025-2030 (Source, MICDE)

This strategic framework is built around three core pillars:

- **AI Digital Infrastructure**: Establishing accessible and affordable AI infrastructure is critical to Kenya's transformation. This includes modernizing the national digital backbone to ensure reliable connectivity, scalable computing resources, and equitable access for developers, enterprises, and citizens.
- **Data asset Governance:** Building a robust and sustainable data ecosystem is essential to unlock the full potential of AI. Strong governance frameworks will ensure data quality, security, interoperability, and ethical use providing the foundation for innovation and trust in AI-driven solutions.
- **AI Research and Innovation**: At the core of Kenya's vision is the ambition to become a global leader in AI model development. This requires fostering a dynamic local R&D environment, nurturing innovation, and creating pathways for commercialization. Emphasis is placed on developing cutting-edge, localized AI models and solutions tailored to Kenya's unique socioeconomic context, while also positioning the country as a competitive player in the global AI landscape

4. Kenya AI Strategy Implementation Roadmap

To ensure the effective implementation of the Kenya AI Strategy 2025–2030, it is critical that planning and execution align closely with the requirements of each strategic initiative. The priority actions include: **1) Strengthening Digital Infrastructure**; **2) Establishing a National Dataset and Foundational AI Models**; **3) Prioritizing Business-Scenario Applications; 4) Promoting Agile Governance and Inclusive Development**; **5) Fostering a Robust and Sustainable Ecosystem**;

By building on these five pillars, Kenya can chart a clear evolution and development roadmap toward 2030, ensuring that the strategic goals are not only achieved but also embedded into the country's long-term digital transformation journey

Figure 4.1. Kenya's AI Strategy Implementation Roadmap Framework

The following five strategic actions are outlined below as brief descriptions for reference:

1. Building an Advanced Digital Infrastructure: To meet the growing demand for high-performance computing services, Kenya will establish a national ICT infrastructure centered on artificial intelligence. This infrastructure will be built around AI Development Centers (ACDCs) and will also upgrade and transform existing networks into a high-bandwidth, low-latency, ultra-stable, and secure computing power network capable of supporting scalable AI workloads, real-

time data processing, and resilient digital services. This infrastructure will serve as a pillar of national innovation, driving intelligent education and healthcare, digital governance, and inclusive economic transformation.

2. Establishing a Secure and Accountable Dataset and LLM: To ensure trustworthy and high-impact AI deployment, Kenya will establish a secure, transparent, and responsible national dataset alongside a large language model (LLM) system. Central to this effort is the creation of Kenya's National Basic Database and corpus, developed under strong data governance frameworks to provide a reliable foundation for innovation and future cross-border data flows. The strategy also defines the technical standards for model training, deployment, and usage to guarantee that LLMs:

- Reflect national values and priorities
- Support access in local languages
- Preserve Kenya's cultural heritage
- Enhance public services in areas such as urban governance, healthcare, and education

By embedding these principles, Kenya aims to build AI systems that are not only technically advanced but also socially inclusive, culturally grounded, and aligned with national development objectives.

3. Prioritizing the development of the critical industry applications: Will strategically advance the development and deployment of AI-powered applications across priority sectors of national transformation, including smart healthcare, smart agriculture, inclusive financial services, smart education, and urban public management. In parallel, the government will invest in high-impact pilot projects designed to serve as demonstrative, scalable models that drive commercial success and broader societal adoption.

These flagship initiatives will highlight the tangible benefits of AI, strengthen public trust, and encourage its integration into additional domains such as transportation, energy, manufacturing, and urban planning. By embedding AI across diverse sectors, Kenya seeks to

foster a digitally empowered society and position itself as a regional leader in inclusive, innovation-driven development.

4. **Establishing a Robust and sustainable ecosystem:** Wil establish a resilient and forward-looking AI ecosystem anchored on three strategic initiatives: strengthening technological and application innovation, fostering multi-stakeholder talent development, and advancing global communication and collaboration.

- **AI Innovation and Application Research**: The government will invest in national AI laboratories and innovation hubs to drive cutting-edge research, prototype development, and industry-specific solutions. These institutions will act as engines of innovation, enabling rapid iteration and deployment of technologies and commercial products tailored to African markets and cultural contexts.
- **AI Talent Development**: A comprehensive talent strategy will cultivate a diverse pool of AI researchers, engineers, policy experts, and domain specialists. This will be achieved through curriculum reform, teaching innovation, and collaborative training programs involving government, enterprises, and educational institutions. Public-private partnerships will further enhance national capacity and ensure inclusive participation across regions and communities.
- **International Cooperation and Standards Alignment**: Kenya will actively engage in global AI dialogues, standards-setting bodies, and bilateral partnerships to strengthen interoperability, uphold ethical consistency, and secure strategic positioning. Collaboration with leading AI nations and institutions will accelerate knowledge exchange, technology transfer, and the co-development of solutions aligned with Kenya's values and long-term vision.

5. **Promoting Agile Governance and Inclusive Development Culture**:

- **Agile Governance:** Kenya will cultivate a dynamic governance model that is adaptive, participatory, and responsive to the rapidly evolving landscape of artificial intelligence. This will involve establishing flexible regulatory frameworks that balance innovation with public

interest, enable rapid policy iteration, and encourage experimentation through regulatory sandboxes and pilot projects.

- **Inclusive Development Culture:** In parallel, the government will foster an inclusive development culture that ensures broad participation across all sectors of society and stakeholders. This approach will guarantee that AI contributes to economic growth, advances social equity, and delivers universal benefits fairly and justly. It will also safeguard national values and promote cultural continuity, embedding AI within Kenya's broader vision of inclusive and sustainable development.

In line with Kenya's AI strategy, these five high-priority actions form a comprehensive implementation roadmap. Together, they will guide Kenya toward a successful industry digital transformation, establishing it as a hub for technology, economy, and talent in Africa.

4.1. Building an Advanced Digital Infrastructure Toward 2030

Building a wide-coverage, high-bandwidth, and low-latency ICT infrastructure and data center IT system is a strategic pillar for future intelligent computing services. This infrastructure not only provides robust computing power for training and inference of large-scale AI models but also enables real-time response within milliseconds, supporting the intelligent upgrade of key industries such as transportation, healthcare, and energy. Wide coverage ensures equitable access to computing resources, while high bandwidth and low latency guarantee high-quality experiences for different types of users. Overall, this kind of infrastructure is both a prerequisite for the widespread adoption of intelligent computing and a core driving force for promoting industrial upgrading, enhancing national competitiveness, and fostering social equity and inclusive development.

4.1.1 Intelligent AI Data Centre Facilities 2030

Global Trends:

Technological Dimension: Artificial Intelligence Data Centres (AIDCs) are evolving into highly specialized infrastructure, equipped with high-performance GPU/NPU clusters, ultra-low-latency interconnects, and advanced orchestration systems. These capabilities enable large-scale model

training and real-time inference, positioning AIDCs as the backbone of next-generation AI innovation.

Security & Accountable Dimension: AIDCs are increasingly viewed as strategic national assets. Governments are ramping up domestic investments in AI infrastructure in response to rising export controls, data localization mandates, and growing concerns over digital sovereignty.

Sustainability Dimension: To meet escalating energy demands, AIDCs are embracing sustainable design principles integrating renewable energy sources, liquid cooling technologies, and energy-efficient architectures. Additionally, workloads are being relocated to cooler climates or energy-abundant regions to minimize carbon footprints and optimize Power Usage Effectiveness (PUE).

Kenya Market Insight:

Current Situation:

- **Infrastructure Growth**: Kenya is expanding digital infrastructure, with growing interest in AI-capable data centres, though most are still general-purpose.
- **Government Support**: National strategies and budget plans emphasize ICT investment, creating a foundation for future ACDC deployment.
- **Private Sector Momentum**: Tech firms and telecoms are investing in cloud and edge computing, laying groundwork for AI workloads.
- **Sustainability Potential**: Kenya's renewable energy and cooler highland regions offer favorable conditions for green ACDC development.

Development Challenge:

- **Limited High-Performance**: Infrastructure: Kenya currently lacks adequate local data centre capacity to support advanced AI workloads, including deep learning and large-scale model training.

- **Energy Reliability & Cost**: Despite significant renewable energy potential, inconsistent power supply and high electricity costs pose major barriers to scaling AI-driven data centres.
- **Data Governance Gaps**: Weak regulatory frameworks around data privacy, sharing, and localization create uncertainty and risk for AI deployment and cross-border data collaboration.

Development Goals for 2030:

Empowering Digital Kenya and Connecting East Africa's Future through the Implementation of Three National AIDCs, and the specific goals include:

Technology Leadership:

- First AI-ready country in East Africa.
- Build cloud-edge-AI architecture with primary & backup sites.
- Enable large model training and real-time inference.

Green & Sustainable Infrastructure:

- Target PUE < 1.3 using liquid cooling & natural ventilation.
- Leverage Rift Valley geothermal energy for zero-carbon operations.
- Aim for more than 60% carbon neutrality by 2030.
- The AIDC shall redundancy and meet or exceed ISO/IEC 22237 Class 3, or Uptime Tier III, or TIA 942 Rate 3.

Inclusive Digital Empowerment:

- Launch "AI for All" programme for startups, SMEs, and universities.
- Establish public data platforms (education, agriculture, healthcare, transport，etc.).
- Develop AI models such as Swahili-language and ethical AI guidelines.

Innovative Technological Adoption and Planning Principles

Innovative Technologies Adoption:

- **High-Density Compute Hardware**: Use of advanced GPUs, TPUs, and NPUs optimized for parallel AI workloads especially for training large models.

- **Liquid Cooling Systems**: Adopt a cooling solution primarily based on liquid cooling, supplemented by air cooling to manage heat from high power density racks (often exceeding 100 kW), improving energy efficiency and thermal stability.
- **Edge-AI Integration**: Supports real-time inference and decentralized processing, reducing latency and bandwidth strain.
- **High-Voltage Power Architecture:** Necessary to support massive energy demands—some campuses now scale up to 1 GW of power consumption.

Planning Principles

- **Location Strategy**: Select sites with reliable, low-cost power, fibre connectivity, and cool climates to minimize cooling demands. Prioritize proximity to edge nodes for real-time AI inference.
- **Comprehensive Planning**: Design computing networks from single data centres to active-standby architectures, ensuring seamless integration across cloud, network, and infrastructure for scalable AI performance.
- **Diversified Cooperation**: Build core data centres in-house while enabling shared access to edge or regional facilities to optimize resource allocation & regional coverage.
- **Scalability and Modularity**: Adopt modular infrastructure to support phased expansion. Design with future-proofing in mind to accommodate exponential growth in AI demand.
- **Centralized Network Management**: Implement a unified, intelligent platform to manage multiple AIDC sites local and remote enhancing operational efficiency, resource utilization, and system stability.
- **Energy Efficiency and Sustainability:** Plan AIDCs with low Power Usage Effectiveness (PUE) by leveraging renewable energy, advanced cooling technologies, and efficient architectures to meet high-performance needs while supporting green, low-carbon operations.

AI Data Centre Facilities 2030

Leverage existing resources enables rapid deployment, reduced investment, and improved economic efficiency.

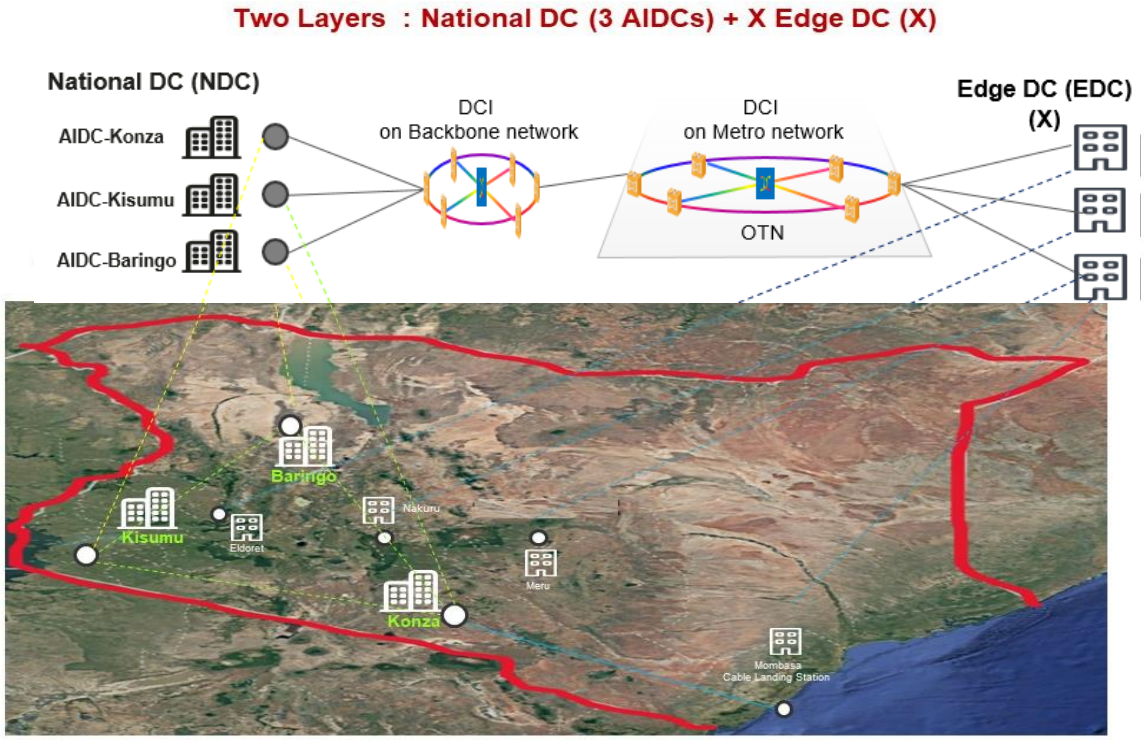

Figure 4.1.1.1. AI Data Centre Facilities 2030

Evolution Roadmap

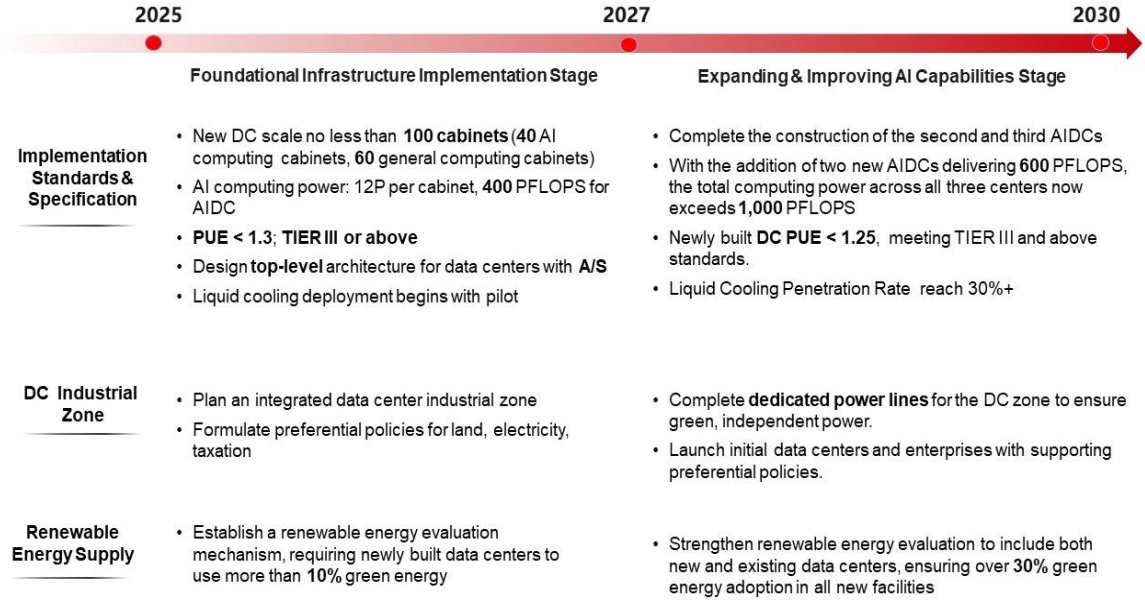

Figure 4.1.1.2. Evolution Roadmap of AI Data Centre Facilities 2030

Value Proposition:

Environmental & Energy Efficiency：

- **Lower Power Usage Effectiveness (PUE):** Green AIDC facilities using immersion liquid cooling can reduce this to 1.2–1.1, saving over 30% in energy consumption.
- **Reduced Carbon Footprint**: By integrating renewable energy sources and efficient cooling systems, these facilities significantly cut greenhouse gas emissions.

Economic Advantages：

- **Faster Deployment**: Modular, pre-installed units can shrink setup time from 10–15 months to just 1–3 months, speeding up ROI.
- **High-Density Computing**: Advanced cooling enables IT cabinets to support power densities over 100 kW, maximizing computing power per square metre.
- **Operational Benefits**: Simplified Maintenance of Modular server design allows easy replacement of components like hard drives and power modules, reducing downtime.

Scalability & Flexibility:

- **Easy Expansion**: Modular architecture means facilities can scale up quickly without major construction.
- **Adaptability**: Systems can be tailored to different workloads and energy sources, making them future-proof.

Built-In Security Features

- **Hardware-Level Encryption:** Many systems include TPM (Trusted Platform Module) chips and secure boot protocols to protect sensitive data.
- **Physical Isolation**: High-security racks can be physically segmented to isolate workloads and prevent unauthorized access.

4.1.2 Intelligent Optical Network Toward 2030

Global Trends

More than 50 countries explicitly outline fibre-optic infrastructure strategies as the foundation of National Digital infrastructure, and over 20 countries have set **gigabit speeds** as goals.

The Optical fibre is transitioning from traditional "optical access" to **a broader role o**f "**connecting everything.**" Its reach is expanding from Fibre to the Home (FTTH), Fibre to the Room (FTTR), Fibre to the Desk (FTTD), and Fibre to the Machine (FTTM). This evolution is driving fibre deployment across campuses, hospitals, commercial buildings, and other high-density environments.

All-optical transport capacity is the consensus in the computing power network industry, offering ultra-low latency, ultra-high reliability, and flexible scheduling capabilities.

The government is accelerating fibre optic construction by releasing favorable policies (such as pre-deployment, co-construction and sharing, network construction subsidies, and innovation incentives).

Kenya Market Insight

Current Situation:

- Kenya's fibre network now spans 13,590 km, with backbone speeds at 100G and border exits reaching 400G.
- Under the GoDTA programme, 2,193 km of fibre have been deployed across 19 underserved counties and achieve 88% of the 2,500 km target.
- In 2022, the government introduced fibre construction standards. Operators often lease poles from Kenya Power for aerial deployment.
- In 2024, new building code requires pre-installed fibre infrastructure.

Development Challenge:

- FTTH coverage is just 13%, with 1.72 million fixed broadband users and 12% household penetration lagging leaders like South Africa.

- Average home broadband speed is 15.4 Mbps, ranking 145th globally, far below the global average of 102.48 Mbps.
- Last-mile connectivity remains limited, especially in rural areas only 1.5 million homes are connected.
- Vandalism and construction damage frequently disrupt fibre lines, raising maintenance costs and affecting service reliability.

Development Goals for 2030

Kenya National Digital Master Plan 2022-2032, aims to achieve nationwide digital connectivity: Deploying 100,000 kilometres of fibre optical to connect 40,000 schools, 20,000 government institutions, and 13,000 healthcare facilities, with the government constructing 52,000 kilometres and private enterprises constructing 48,000 kilometres.

Kenya Universal Service Fund Strategy 2023-2027， address the "last mile connectivity" gap, achieving 100% digital connectivity by 2027.

The objectives are to implement an AI-ready national intelligent optical network by expanding uninterrupted access and coverage of broadband connectivity, and to offer huge-bandwidth, low-latency, and ultra-reliable computing power transmission network.

Innovative Technologies Adoption and Planning Principles

Innovative Technologies Adoption:

Build a High-Capacity, Highly Reliable, Low-Latency intelligent optical Network as the foundation of computing power network. To build an end-to-end AI-ready architecture and achieve hierarchical ultra-low latency circles, the specific requirements are as follows:

- **One-hop OTN connection**：The preferred solution for enterprise-to-data centre connectivity, offering the lowest latency.
- **800 Gigabits Optical Fibre Technology**: Ultra-high-speed links between AIDCs are a fundamental requirement.

- **Mesh-based optical networking**: Combines fibre-optic technology with a mesh topology, where each node (like a router or switch) connects to multiple other nodes, creating a web-like structure for reliable transmission.
- **E2E OXC (Optic Cross Connection) system**: a device that switches optical signals between different fibres without converting them to electrical signals, enabling simplified, scalable, green sites.

Planning Principles:

- **Phased Deployment**: Adopt a tiered approach ("urban → rural," "basic coverage → optimized upgrade") to achieve nationwide gigabit optical network coverage.
- **Hierarchical Latency**: With Nairobi's dual-active data centres as the 1ms latency core, build a graded (core → edge) computing power network latency circle.
- **Diversified Cooperation**: Core DC networks prioritize self-built, while edge DC networks are jointly constructed and shared.
- **Mesh-based optical networking**: leveraged between AIDCs with resilience against multiple fibre cuts is a mandatory configuration.
- **Cost Efficiency:** Reduce user access barriers through fibre pre-deployment, shared pole/duct infrastructure, and cost-saving technologies.
- **Full-fibre architecture**: Deploy mention in newly built schools, campuses, and government institutions will become the main solution.

Intelligent Optical Network 2030

Building the Intelligent Optical Target Network 2030, characterized **by ultra-high bandwidth, low latency, and exceptional reliability.** This initiative aims to establish a next-generation optical infrastructure that supports advanced digital services, AI workloads, and mission-critical applications—delivering seamless connectivity and resilient performance at national scale.

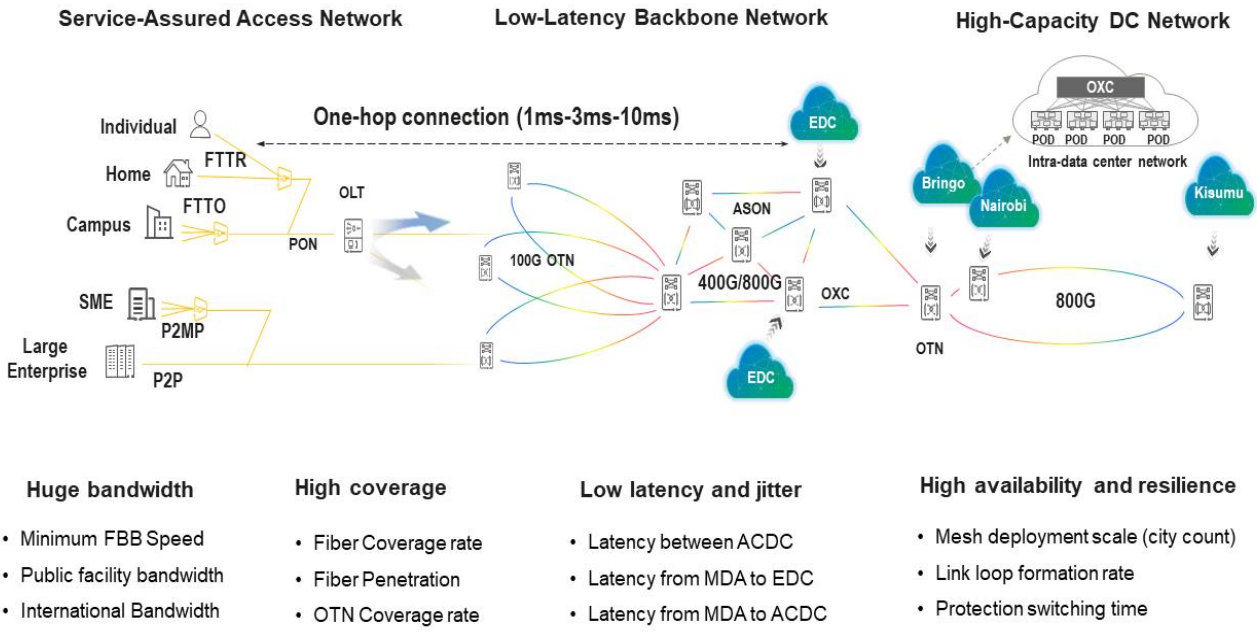

Figure 4.1.2.1. Intelligent Optical Target Network 2030

Evolution Roadmap

Phase 1: Connectivity Enhancement (2025–2027): Expand optical network coverage from urban centres to rural areas, while improving bandwidth capacity and network stability—laying the foundation for inclusive digital access and intelligent infrastructure**.**

Phase-2: Intelligence Adoption Stage (2027-2030): While enhancing network transport capacity, this phase leverages operational data to introduce intelligent maintenance and predictive analytics reducing engineering workload, anticipating faults, and improving overall reliability through automation.

Phase-3: Scaled Intelligence Deployment Stage (2030-2035): As intelligent functions are scaled, the network can achieve real-time fault prediction, automated maintenance, and optimized traffic management reducing operational costs, improving reliability, and supporting advanced digital services nationwide.

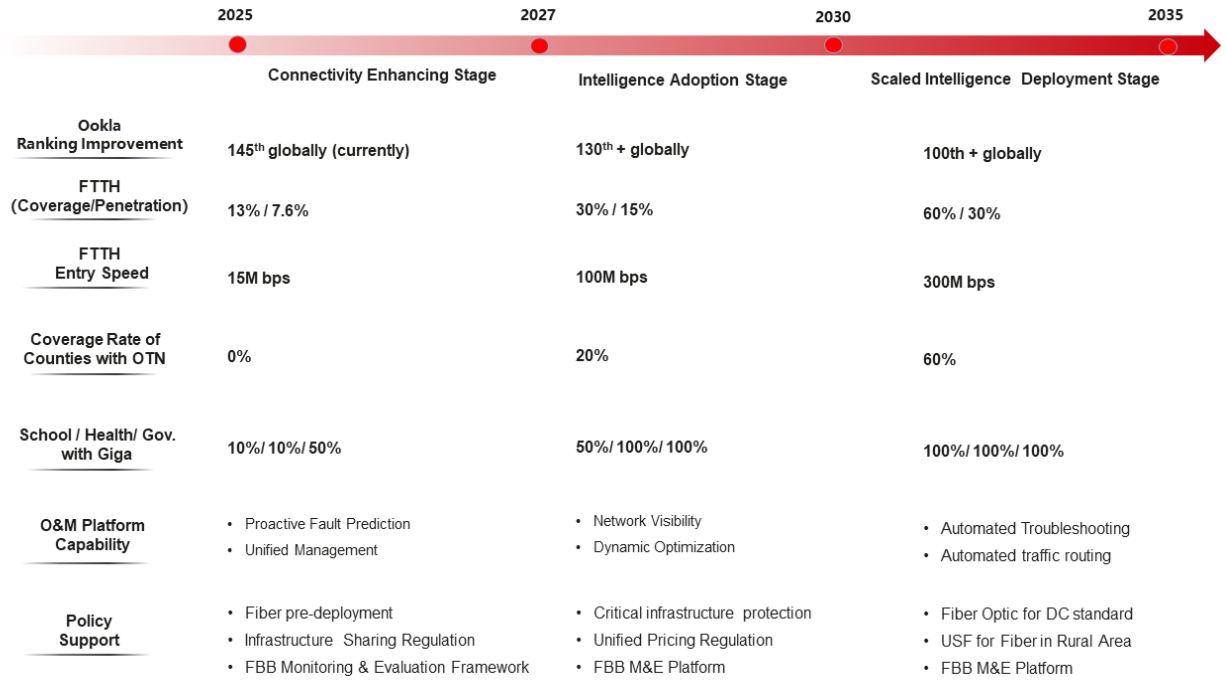

Figure 4.1.2.2. Evolution Roadmap of Intelligent Optic Target Network 2030

Value Proposition

Network Competitive:

- Enable fixed broadband to become the digital nerve centre for households and businesses.
- Create an investment-friendly environment, enhance the country's economic competitiveness, and drive the digital transformation of various industries.

Dynamic Optimization:

- AI algorithms adjust bandwidth, routing, and switching in real time.
- This means faster speeds, lower latency, and better performance during peak traffic.

Predictive Maintenance：

- Machine learning can detect early signs of failure or degradation.
- Operators can fix issues before they cause outages, reducing downtime & repair costs.

Energy Efficiency:

- Intelligent systems optimize power usage across transceivers and switches.
- This leads to greener networks and lower operational costs.

4.1.3 Intelligent IPV6/SRv6 Network 2030

Global Tends

IPv6-Based Future Network is the foundation for Digital Economy & AI Era, and the trends are clearly as below:

- **IPv6 Deployment Accelerates**: Over 50% IPv6 adoption; 700+ SRv6 commercial operators' deployments.
- **Enables programmable networks**: Networking with slicing, QoS, multi-cloud access, and AI-driven automation.
- **AI Brings New Network Demands**: Generative AI and smart terminals drive needs for lossless transmission, differentiated assurance, cloud-edge synergy, intelligent O&M, green efficiency, and built-in security.
- **Data Centre Network Evolution**: Ethernet becomes the main steam open solution in AI model training and inference, switch port rate upgraded to 400GE/800GE, computing-network synergy enhances computing efficiency.
- **10G Campus Upgrade**: Enterprises and campuses shift to 10G access. Wi-Fi 7 scaling fast—233M terminals by 2024, 12M APs by 2027.
- **Industry Momentum:** WBBA's Net 5.5G white paper guides global pilot projects. 18+ projects launched with strong support from China, Europe, Middle East, and Africa.

Kenya Market Insight

Kenya has clearly made significant progress and is emerging as a Tier-1 nation group within Africa. However, numerous challenges remain as the country advances toward its Vision 2030 goals. Details are outlined below.

Current Situation:

- **IPv6 Adoption & Experience**: IPv6 user availability is ~21%; BGP router availability ~57%, above Africa's average. Safaricom has started SRv6 deployment. However, limited IPv6 support on user devices and local content weakens end-to-end experience.

- **NOFBI Coverage & Challenge**s: NOFBI spans 47+ counties with 13,000+ km of fibre. Despite wide coverage, access rates remain low, with regional disparities and a clear urban-rural broadband divide.
- **Data Centre Network Architecture**: Mainstream DCNs use 10GE/25GE ToR and 40GE/100GE spine switches. 400GE is not yet deployed, restricting AI and big data performance.
- **Enterprise Campus Network**: Some universities (e.g., Nairobi, Kenyatta) have modern networks via KENET. SME campuses rely on outdated 100 Mbps unmanaged switches, lacking standards, scalability, and security.

Development Challenge:

- **Legacy IPv4 Systems limited**: Legacy Infrastructure Kenya's IP backbone still heavily relies on IPv4, limiting scalability and compatibility with SRv6. Transitioning to IPv6 requires significant upgrades across core and edge networks.
- **Slow IPv6 Adoption**：Although SRv6 depends on IPv6, adoption remains slow among ISPs and enterprises. Safaricom has initiated SRv6 deployment, but limited IPv6 support on user devices and local content weakens the end-to-end experience.
- **Skills Gap**：Advanced IP technologies like SDN and segment routing demand specialized expertise. Kenya's networking workforce lacks enough hands-on experience, slowing deployment and optimization.
- **Data Centres**: Kenya's data centres currently do not support 400GE (400 Gigabit Ethernet), which limits bandwidth and slows down performance for AI and big data workloads. This affects tasks like large-scale model training and real-time analytics
- **Campus Networks:** Many SMEs still use outdated switches that lack scalability and security. This makes it harder to support modern digital services, cloud applications, and AI integration.

Development Goals for 2030

According to Kenya's Digital Master Plan 2012-2032, it aims to build a regional IP hub and high-capacity end-to-end network to support computing power exchange between enterprises and training centres, and detail as below:

- **IPv6 Expansion**: Scale IPv6 deployment across public and private sectors for secure, future-ready connectivity.
- **Backbone Enhancement**: Strengthen national fibre (e.g., NOFBI) for high-speed, reliable IP transport and reduced urban-rural divide.
- **Data Centre Modernization**: Upgrade to 400GE architectures to support AI, big data, and cloud with low latency and high capacity.
- **End-to-End Experience**: Ensure IPv6 support on devices and local content for seamless digital access.
- **Smart Campus & Enterprise Networks**: Shift from legacy systems to gigabit-capable, secure, and standardized infrastructure.
- **Digital Economy Enablement:** Leverage IP networks to power e-government, fintech, smart agriculture, and innovation.

Innovative Technology Adoption and Planning Principles

Innovative Technologies Adoption:

- **IPv6/SRv6**: Simplifies architecture by eliminating MPLS protocols (LDP, RSVP). Enables flexible traffic engineering, differentiated SLAs, and smooth IPv6-only transition. It is recommended to consider network equipment with the IPv6 and SRv6 Ready Logos, which are promoted by IPv6 Forum as a globally recognized certification that validates products for conformance and interoperability with IPv6-related standards. Accelerates service deployment via SDN automation.
- **400/800GE AI WAN**: Supports ultra-fast data transfer (up to 3.6 Tbps/device) with microsecond latency for AI workloads. Uses AI-driven flow detection and service awareness for dynamic resource allocation and SLA assurance. Automates fault prediction and repair to cut O&M costs.

- **400/800GE High Computing Efficiency DCN**: Innovative networking technologies support ultra-large-scale clusters, 400GE/800GE Ethernet deliver high bandwidth, network-level load balancing ensures lossless and high throughput, intelligent fault tolerance capabilities guarantee continuous service availability.
- **Wi-Fi 7 10Gigabit Campus**: Offers 10GE access and 100G core to support long-term growth. Delivers seamless roaming, 3× capacity, and ultra-low latency. Handles AI collaboration, VR learning, and 50+ HD video streams concurrently.

Planning Principles：

- **IPv6-First & SRv6**: Simplifies architecture, enables fine-grained traffic control, and supports IPv6-only evolution.
- **Deterministic Experience**: Delivers predictable latency and reliability with SLA-based service assurance.
- **Intelligent scheduling and automated operations**: leverage AI-driven analytics and simulation technologies to enable smart service path orchestration, fault prediction, and self-healing—enhancing overall network operational efficiency.
- **Converged Infrastructure**: Integrates fixed, mobile, and enterprise networks for unified transport and simplified management.
- **Cloud-Network Synergy**: Seamless integration with cloud and edge computing environments, and ideal for distributed AI workloads and multi-domain service delivery.
- **Built-in Security**: Embeds zero-trust, encryption, and AI-driven threat detection for end-to-end protection.

Intelligent IP/SRv6 Target Network 2030

The intelligent IP/SRv6 Target Network 2030 Focuses on building three differentiated target networks, powered by SRv6 for flexible routing, service-aware traffic engineering, and end-to-end programmability positioning the national internet infrastructure for intelligent, scalable, and future-ready connectivity.

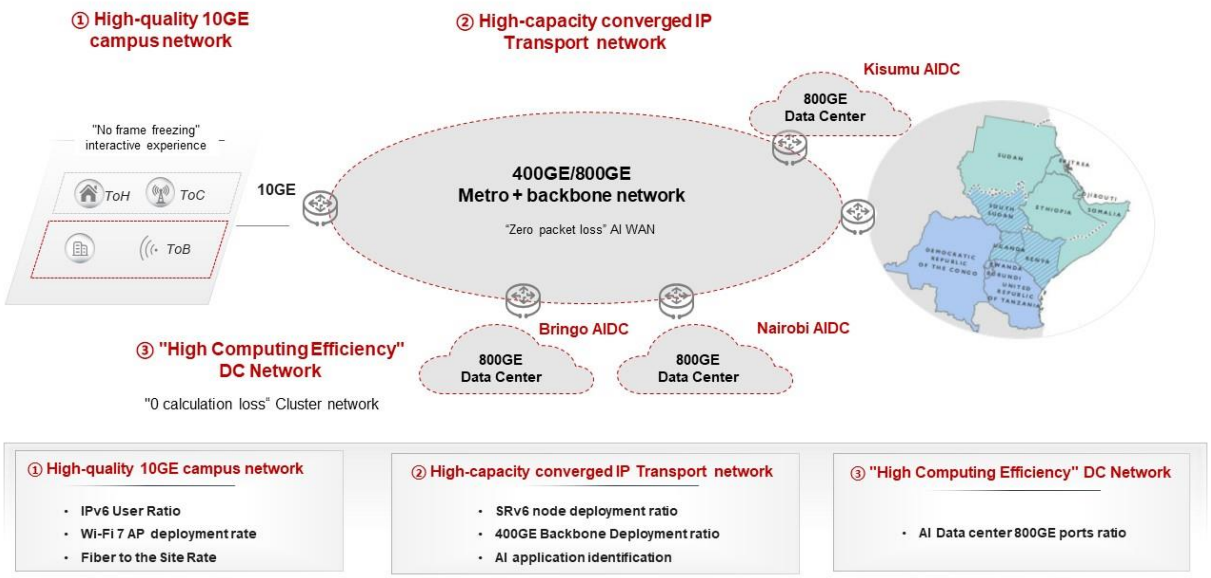

Figure 4.1.3.1. Intelligent IP/SRv6 network Target Network 2030

Evolution Roadmap

National Future Network Infrastructure

- **Phase 1 (2025–2027):** Expand fibre coverage, boost IPv6 adoption, begin SRv6 node deployment, and upgrade metro backbone segments to 400GE.
- **Phase 2 (2027–2030):** Scale 400GE deployment nationwide, achieve full IPv6 coverage, and enable multi-cloud service orchestration.
- **Phase 3 (2030-2035):** Build a nationwide intelligent 400GE AI WAN with full programmability and smart operations.

National AI Infrastructure & Data Centres

- **Phase 1 (2025–2027):** Upgrade and build AI data centres with 400/800GE ports and launch initial interconnection projects.
- **Phase 2 (2027-2030):** Increase port density, deploy SRv6 interconnects, and enable efficient compute scheduling.
- **Phase 3 (2030-2035):** Establish multi-centre high-speed interconnects with elastic scheduling and data sovereignty support.

Enterprise Digitalization & 10G Campus Networks

- **Phase 1 (2025–2027):** Deploy Wi-Fi 7 and 10G Ethernet in pilot campuses to enhance digital readiness.
- **Phase 2 (2027–2030):** Expand coverage and adoption across enterprises, schools, and industrial parks.
- **Phase 3 (2030-2035):** Achieve widespread 10G campus networks to support high-bandwidth, low-latency applications like VR/AR and digital twins.

East African Unified Market Network Infrastructure

- **Phase 1 (2025–2027):** Launch cross-border backbone pilots, deploy SRv6 nodes, and connect key ports and corridors via IPv6.
- **Phase 2 (2027–2030):** Scale regional backbone and data centre interconnects to enhance cross-border data exchange.
- **Phase 3 (2030–2035):** Build an intelligent regional platform for traffic scheduling, resource sharing, and unified digital market development.

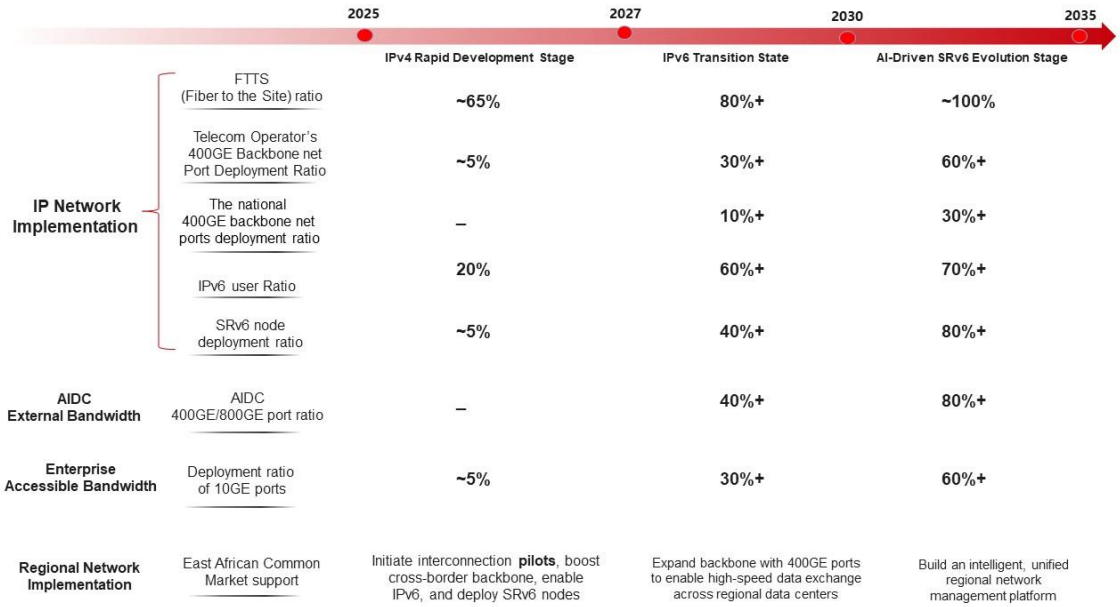

Figure 4.1.3.2. Evolution Roadmap of Intelligent IP/SRv6 Target Network 2030

Value Proposition

IPv6/SRv6

- **Simplified Architecture**: Removes MPLS protocols (LDP, RSVP) to ease deployment and maintenance.
- **Flexible Traffic Engineering**: Provides precise path control and SLA-based services for end-to-end assurance.
- **Native IPv6 Support**: Enables smooth migration to IPv6-only networks.
- **Automation & Programmability**: Uses SDN-based automation to accelerate service rollout.

400/800GE AI WAN

- **High Performance & Low Latency:** 400GE interfaces with 3.6T capacity ensure microsecond-level latency for AI workloads.
- **Intelligent Service Awareness**: AI flow detection supports dynamic resource allocation for critical tasks.
- **Automated O&M:** AI-driven anomaly prediction and repair reduce operating costs.

400/800GE Hight Computing Efficiency DCN

- **High computing efficiency:** 400GE/800GE Ethernet deliver high bandwidth, network-level load balancing ensures lossless and high throughput.
- **High reliability**: Intelligent fault tolerance capabilities guarantee continuous service availability.

Wi-Fi 7 10Gigabit Campus

- **Next-Level Connectivity:** Supports 10GE access and 100G core for future growth.
- **Superior Wireless Experience**: Wi-Fi 7 APs enable 3× capacity, seamless roaming, and millisecond latency.
- **High Bandwidth Support:** Handles large file transfers, AI collaboration, and 50+ HD video streams smoothly.

4.1.4 Intelligent Wireless Network (5G x AI) 2030

Global Trends

Global 5G population coverage reaches 40%, and it is expected that by 2030, 5G population coverage will exceed 85%.

5G will significantly enhance network determinism and reliability, and the application scenarios of 5G are continuously expanding, including industrial internet, smart cities, and vehicle networking .

2025 is the first year of mobile AI particularly in the industrial internet sector, with leading 5G countries such as China and Middle East developing commercial applications for typical AI scenarios such as AIGC, AI agents, and AI driving.

The proportion of 5G smartphone shipments is expected to 87% by 2028. Additionally, AI terminals have emerged in recent years, gradually moving towards ecosystem, like: AI phones/PCs/tablets/wearables

Kenya Market Insight

Current Situation:

- **4G Coverage & Penetration**: Kenya has achieved 60% 4G penetration (i.e. usage), with widespread coverage in urban and semi-urban areas (97% nationwide network).
- **5G Expansion**: Safaricom and Airtel both have significant 5G rollout, targeting 30% adoption by 2027. Deployment focuses on high-demand zones.
- **Mobile Usage Surge**: Kenya now has 76.2 million active SIM cards, exceeding its population. Smartphone users reached 42.3 million, with mobile money and streaming driving data demand

Development Challenge:

- **AI Traffic Surge**: Smart devices require lower latency and stronger uplink speeds.
- **Rural Coverage Gaps:** Many remote areas still lack reliable mobile internet.
- **Spectrum Constraints**: Fragmented allocation slows 5G rollout and optimization.
- **Regulatory Barriers**: Reforms needed to streamline spectrum access and attract investment.

- **Affordability Gap**: Despite 97% 4G coverage, 65% remain offline due to device & data.

Development Goals for 2030

- Mobile broadband (MBB) is a core pillar in building the AI-centric digital economy and a critical infrastructure for advancing digital government, digital commerce, innovation, entrepreneurship.
- High-speed MBB services in major cities set the stage for the realization of mobile AI.
- Personal intelligent mobile services are initially adopted by high-end device users in major cities, and gradually expanded to a broader base of mobile users.
- Intelligent Wireless Networks could contribute to the social & economic development, e.g. Smart Factories: Real-time robot control boosts efficiency; Autonomous Driving: V2X enables safer, smarter transport, and low-altitude economy, etc.

Innovative Technologies Adoption and Planning Principles

Innovative Technologies Adoption:

- **AI-Driven Network Optimization**: Artificial intelligence enables real-time traffic management, predictive maintenance, and dynamic resource allocation.
- **Edge Computing**: Brings data processing closer to users, reducing latency and supporting real-time applications like autonomous vehicles and industrial robotics.
- **High-Precision Propagation Models**: Advanced modeling tools improve coverage prediction and site planning accuracy, especially in dense urban environments.
- **Predictive Maintenance:** AI systems analyse real-time data to anticipate and prevent network failures, improving reliability and reducing downtime.
- **Network Slicing**: Creates virtual networks tailored to specific use cases (e.g., healthcare, manufacturing), each with its own performance parameters.

Planning Principles:

Mobile AI Service Experience Requirements

- **Real-Time Interaction**: Millisecond-level responsiveness for smooth user engagement.

- **Seamless Connectivity**: Stable, low-latency handovers across networks.
- **High-Quality Streaming**: Enough bandwidth for HD and immersive content.
- **Personalization**: Edge computing enables localized, real-time recommendations.
- **Energy Efficiency**: Network-side processing reduces device power usage.
- **Privacy & Security**: Strong data protection and secure transmission.

Network Performance Requirements

- **Ultra-Low Latency**: Essential for real-time AI tasks and autonomous systems.
- **High bandwidth Throughput & Short Latency**: Uplink experience speed rate 20Mbps at cell edge.

Intelligent Wireless Target Network (5G x AI) 2030

The 5G × AI Wireless Network Toward 2030 is an intelligent, adaptive wireless architecture that combines 5G connectivity with AI-driven automation enabling real-time optimization, predictive maintenance, dynamic slicing, and ultra-low latency services across industries and smart environments.

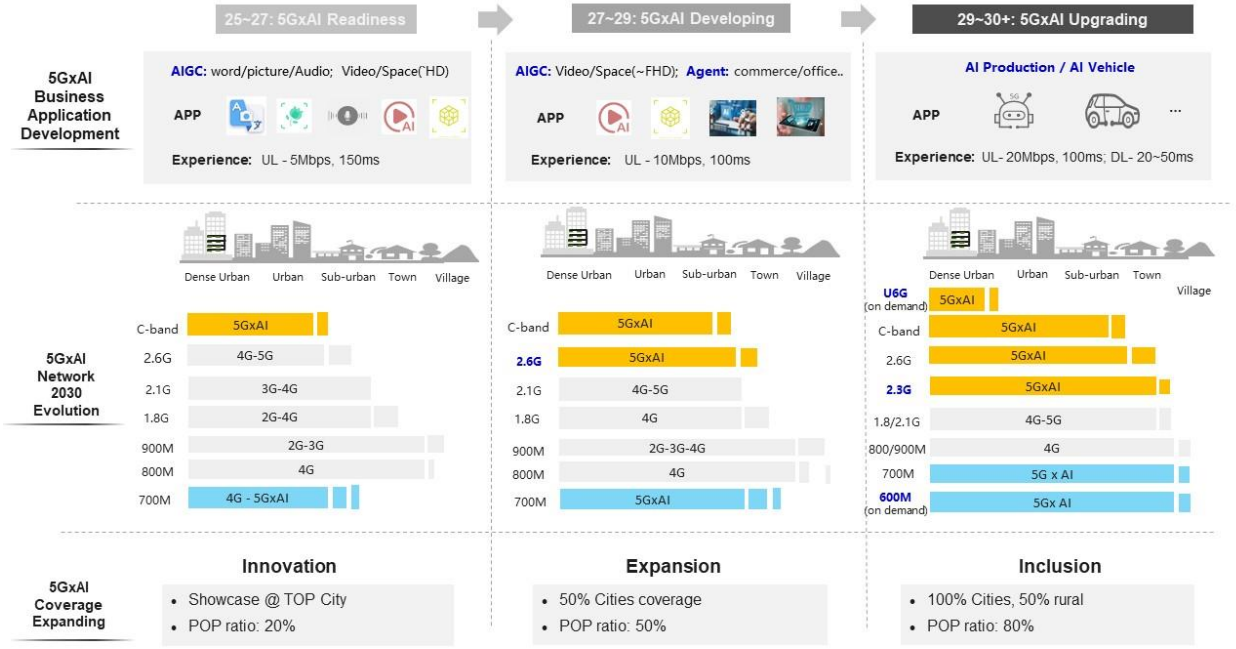

Figure 4.1.4.1. Intelligent Wireless Target Network (5G x AI) 2030

Evolution Roadmap:

Application Experience Targets

- **Phase-1 (2025–2027):** AIGC experience enabled by an uplink capacity of 5 Mbps and a latency of 150 milliseconds.
- **Phase-2 (2027–2029):** AIGC/AI Agent experience enabled by an uplink capacity of 10 Mbps and a latency of 100 milliseconds.
- **Phase-3 (2029–2030+):** AI production/driving experience enabled by an uplink capacity of 20 Mbps and a latency of 100 milliseconds in uplink as well as latency of 20-50 milliseconds in Downlink.

Spectrum Layering Planning

- **Phase-1**: Combing C-band and 700MHz.
- **Phase-2**: Combing C-band, 2.6 GHz and 700MHz.
- **Phase-3**: Combing U6G, C-band, 2.6 GHz, 2.3 GHz, 700MHz and 600MHz.

5G Coverage Expansion Targets

- **Phase-1**: Deployment in core cities, achieving 20% population coverage
- **Phase-2**: Deployment in 50% major cities, achieving 50% population coverage
- **Phase-3**: Deployment in full urban + 50% rural core cities, achieving 80% population coverage.

Ecosystem Development

- **Phase-1**: Introduction of ToC AI terminals, including phones and tablets
- **Phase-2**: Expansion to ToC wearables and ToH AI customer-premises equipment (CPE)
- **Phase-3**: Deploy ToB AI terminals to support industrial applications and autonomous vehicles

Figure 4.1.4.2. Evolution Roadmap of Intelligent Wireless Network 2030

Value Proposition

- **Ecosystem Support:** Align with Kenya's AI roadmap to foster innovation in mobile AI applications.
- **5G Infrastructure**: Build networks optimized for mobile AI experiences across urban and rural areas.
- **Spectrum Strategy**: Reserve and allocate 5G spectrum to meet mobile AI performance needs.
- **Nationwide Rollout**: Develop a phased 5G AI network plan based on Kenya's 5-year AI goals.
- **Quality Assurance**: Establish national standards for mobile AI QoS and regulatory oversight.
- Industry Enablement: Introduce platforms and policies to grow Kenya's mobile AI ecosystem.

4.1.5 Network Security Protection Model 2030

Framework and Pillars of the Cyber Security Model

To address escalating cyber threats amid digital transformation, countries should set tailored maturity goals across five strategic pillars, aligned with national conditions:

Cybersecurity Strategy & Policy:

- Develop and implement national cybersecurity strategies.
- Enhance resilience while safeguarding critical digital interests across government, business, and society.

Legislation & Oversight:

- Enact and enforce cybersecurity laws.
- Strengthen institutional capacity across law enforcement, regulatory bodies, and judicial systems.

Standards, Institutions & Technologies:

- Establish cybersecurity standards and best practices.
- Build dedicated institutions and deploy technical controls to mitigate risks.

Culture & Knowledge Development:

- Promote cybersecurity awareness across public and private sectors.
- Invest in professional training and research to foster a security-conscious society.

Market & Industry Growth:

- Support the development of a robust cybersecurity industry.
- Encourage multi-sector collaborations among government, nonprofits, and enterprises.

Maturity Goal Planning:

Development goals should be defined and achieved based on national readiness across three levels:

- Foundational: Basic legal, policy, and technical frameworks established.
- Intermediate: Coordinated implementation across sectors with measurable outcomes.
- Advanced: Adaptive, intelligence-driven cybersecurity ecosystem with global integration.

Development Levels of the Cyber Security Model

Development goals should be planned and achieved in key areas based on different development levels. The definition of development levels is as follows:

Level-1 (Initial stage):

There is no evidence that the state has developed or implemented a specific plan, and there may be temporary actions to respond to the incident. At this stage, the maturity of network security is still in the bud or does not exist at all.

Level-2 (Definition Level):

The country recognizes the importance of cyber security and initially specifies the relevant units, objectives, plans, and stakeholders. There may be pilot projects, but there is no evidence that the plan has achieved the desired results.

Level-3 (Formation stage)

The country has formulated a relatively complete action plan. There's a clear evidence to imply that it is being implemented by the designated organization. However, due to inadequate resource allocation and management, the activities have not been reviewed and optimized.

Level-4 (Improved grade)

The country not only has a complete plan of action, which is well implemented, but is regularly evaluated and optimized. However, countries do not have the capacity to contribute internationally and respond to global cybersecurity incidents.

Level-5 (Adaptive stage)

The country has a clear strategy to dynamically adapt to the changing cyber security environment. It has the capabilities of self-optimization, rapid decision-making, reallocation of resources, and continuous monitoring. It has played a leading role in international cooperation in the field of cyber security.

Evolution Roadmap of the Cyber Security Model

1. In the early stage of development (from 2025 to 2026):

- Develop key objectives and results in the next five years in cyber security strategy and policy elements, cyber security legislation and supervision, cyber security standards and organizations and technologies, cyber security culture and knowledge, and cyber security market and industry based on existing local and international best practices.
- Refine the target results into actions with indicators, and check items based on different maturity levels. Actions must cover data security, cloud security, energy industry cyber security, financial and e-commerce security, and telecom security.

2. In the middle stage of development (2027-2029):

Promotes the model based on the experience and achievements in the initial stage. Select different fields and organizations in the country as pilots, evaluate the current maturity level and gaps, and develop improvement plans.

3. In the long-term development period (2029 to 2035):

The key task is to implement the improvement plan, review the completion status, and initiate the formulation of a new round of cyber security development plans.

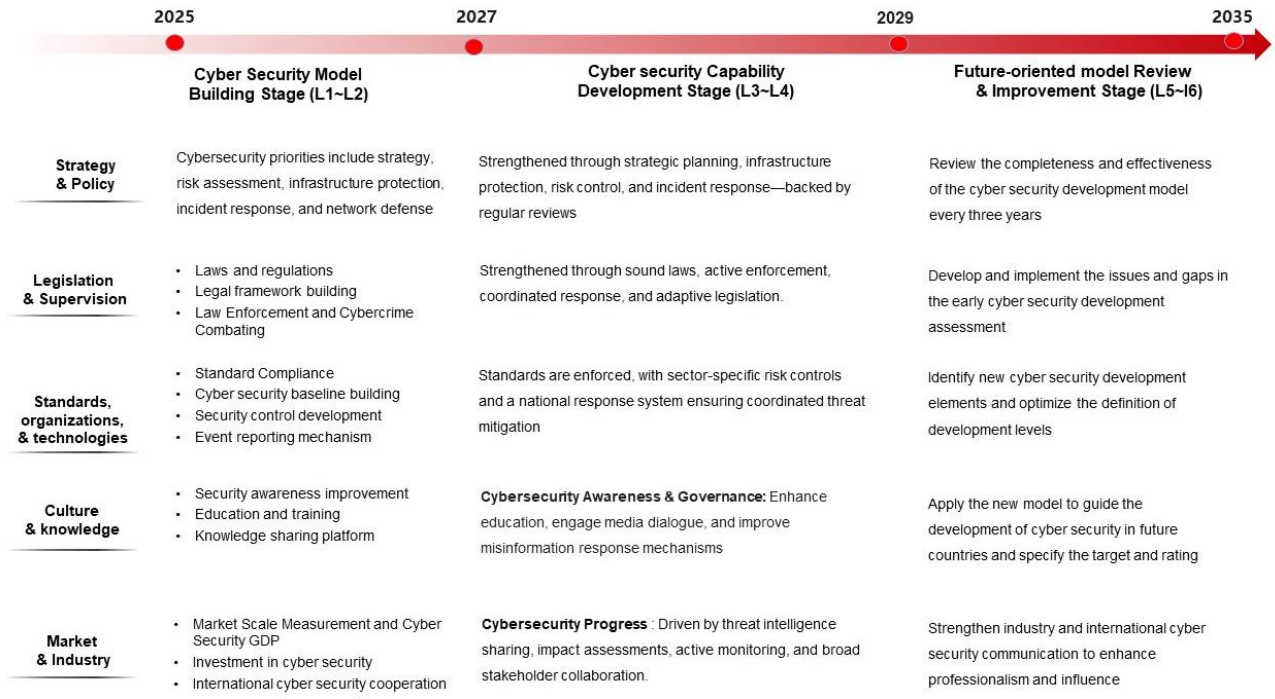

Figure 4.1.5.1. Evolution Roadmap of Network security development Model 2030

4.2. Establishing a Secure and Accountable Dataset & LLM

In the future development of AI industry in Kenya, establishing a cross-border data circulation system, cultivating national data assets, and building locally generated large AI models are key measures to achieve national data sovereignty, cultural heritage preservation, and the maintenance of core values. These elements together form the strategic driving forces for sovereignty, innovation, and inclusive development. To achieve this goal, it is urgently necessary to build a powerful and scalable intelligent computing center as a core capability platform. This platform should not only provide a comprehensive data governance mechanism but also support the training and iteration of local large models, thereby laying a solid foundation for Kenya's digital economy and AI industry.

4.2.1 AI Computing Power Platform toward 2030

Global Trends

Global AI computing power platforms are rapidly scaling to meet the explosive growth of foundational models, with sovereign infrastructure, energy efficiency, and democratized access emerging as key strategic trends.

Sovereign AI Infrastructure:

- **Countries are investing in national AI supercomputing hubs** to reduce reliance on foreign platforms and assert data sovereignty.
- Examples include **India's AIRAWAT** and **China's Pengcheng Cloudbrain**, all designed to support domestic model training and secure data processing.

Exponential Compute Demand

- According to Bain & Company, **global AI compute requirements could reach 200 gigawatts by 2030**, driven by the scale of generative models and enterprise adoption.
- This demand is growing **twice as fast as Moore's Law**, outpacing traditional infrastructure planning.

Energy-Efficient & Sustainable Design

- AI compute platforms are being reimagined with **green data centre strategies**, including liquid cooling, renewable energy integration, and carbon-aware scheduling.

- Sustainability is now a core criterion for public and private sector AI infrastructure investment.

Specialized Hardware & Architectures

- Global leaders are deploying **custom AI chips (e.g., NVIDIA H100, Google TPU, Huawei Ascend)** optimized for model training and inference.
- There's a shift toward **modular, scalable architectures** that support both centralized supercomputing and distributed edge AI.

Open Access & Democratization

- Platforms like **AI Singapore** and **Europe's GAIA-X** are promoting **shared compute resources** for startups, academia, and public institutions.
- This trend supports inclusive innovation and reduces barriers for emerging economies.

Policy-Driven Compute Governance

- Governments are introducing **AI infrastructure standards, access policies, and ethical guidelines** to ensure responsible use of national compute platforms.
- The AI Now Institute emphasizes the need for **public oversight and community-driven governance** of AI infrastructure.

Kenya Market Insight

- **Industry Adoption Trials**: AI applications have already emerged in sectors such as agriculture, healthcare, and finance.
- **Workforce Development:** Young professionals are engaged in AI-related roles at international companies, including software BPO and data governance—examples include firms like Sama.
- **Supporting Governance Framework**: Regulations have been introduced covering AI development, ethics, data protection, cybersecurity, and information security.

While significant progress has been made, **numerous challenges** remain to be addressed in the next phase of development:

- **Significant Skills Gap**: AI skills taught in universities are misaligned with actual industry needs.

- **Low Data Quality**: Poor data quality and limited accessibility hinder large model training and affect AI development, ethics, data protection, and cybersecurity enforcement.
- **Insufficient Computing Infrastructure**: Shortage of AI computing resources, unstable network performance, and inadequate cooling and energy systems impede large-scale model training.

Development Goals for 2030

Based on the Kenya National Digital Master Plan 2022~2032 and the Kenya AI Strategy 2025-2030, the objectives are:

- Build a robust, secure, affordable, accessible and reliable digital ecosystem which benefits the public and private sector, and improved quality of life.
- Invest in the construction and expansion of AI-capable digital infrastructure nationwide.
- Develop robust edge computing capabilities to support AI research, development, and deployment.
- Strengthen the construction of high-performance computing (HPC) clusters, aiming to build three AI data centres compliant with TIA 942 (ANSI standard) within five years.

Innovative Technology Adoption and Planning Principles

Innovative Technologies Adoption:

- **“Lightweight Models + Edge Intelligence” Architecture**: To address the challenges of unstable networks and weak terminal computing power in Africa, deploy lightweight models (TinyML + MoE architecture) that enable local inference at edge nodes, thereby reducing reliance on central computing resources.
- **Hybrid Energy-Driven Green AIDC:** The world's first AI data centre powered by 100% geothermal and solar energy, leveraging East Africa's Rift Valley geothermal resources to achieve "zero-carbon computing" and set a green digital benchmark for Africa.
- **Multi-Language AI Engine (Swahili-first)**: Build the world's first multi-language AI model repository with Swahili as the core training corpus, promoting African language AI localization, universal knowledge education, and bridging the urban-rural digital divide.

- **Federated Learning-Driven Data Sharing Mechanism**: In sectors such as healthcare and agriculture, adopt Federated Learning technology to enable "data usability without visibility," addressing privacy and data silo issues.
- **Modular Scalable Design (Modular AIDC)**: Adopt containerized modular data centres to support rapid deployment and phased expansion, adapting to incremental funding and demand growth.

Planning Principles

The four sub-forums with different function could be designed, detail as below:

1) **Public Computing platform**: A government-enabled digital infrastructure designed to provide **shared, high-performance computing services** to enterprises and public sector institutions. It functions as a **national digital backbone**, offering scalable resources for artificial intelligence, big data analytics, and advanced digital applications.

2) **Business Applications Innovation platform**: A strategic digital environment created to empower enterprises to **innovate across product lifecycles and optimize operational efficiency**. It provides a structured foundation where organizations can simulate, test, and deploy new business models, processes, and digital solutions in a secure and scalable manner.

3) **Digital Cultivation platform**: A national-level digital ecosystem designed to equip **universities and vocational training centres** with advanced resources for digital skills development. Its purpose is to **nurture a workforce proficient in emerging technologies and globally competitive in the digital economy.**

4) Ecosystem Aggregation platform: A strategic digital infrastructure established to **consolidate and strengthen the domestic AI ecosystem** by providing a unified environment for collaboration, innovation, and resource sharing. It acts as **a central hub connecting** government agencies, enterprises, research institutions, and third-party partners, enabling seamless integration and co-creation of AI solutions.

- **Autonomous Control:** Ensure that national large models are fully controlled under national governance in terms of technology, architecture, data, etc. Implement

monitoring and auditing measures to effectively manage and control the use and operation of the models, ensuring the security and controllability of business processes

- **Open Sharing:** Adhere to open development, maintain an open ecosystem, promote the exchange and cooperation of AI technology globally, and drive the popularization and application of AI technology, allowing more people to benefit from the development of AI technology.
- **Collaborative Innovation**: Encourage the participation of industry, academia, and research sectors to promote independent innovation in large model technology, enhance the core competitiveness in the AI field, and drive the continuous advancement of AI technology.
- **System Security:** Includes network security, data security, algorithm security, etc. It is necessary to build a full-stack security. protection system covering algorithms, data, and deployment.

AI Computing Power Platform 2030

By 2030, Kenya's AI Computing Power Platform designed as a powerful, controllable, and localized computing service centre will serve as the backbone of national AI development. It will deliver high-performance, sovereign, and context-aware computing capabilities to support local model training, secure data processing, and real-time AI deployment across key sectors.

Firstly, from a functional framework perspective, the architecture is organized into four layers: hardware infrastructure, computing capability, enablement platforms as well as industry applications, and. The details are outlined below.

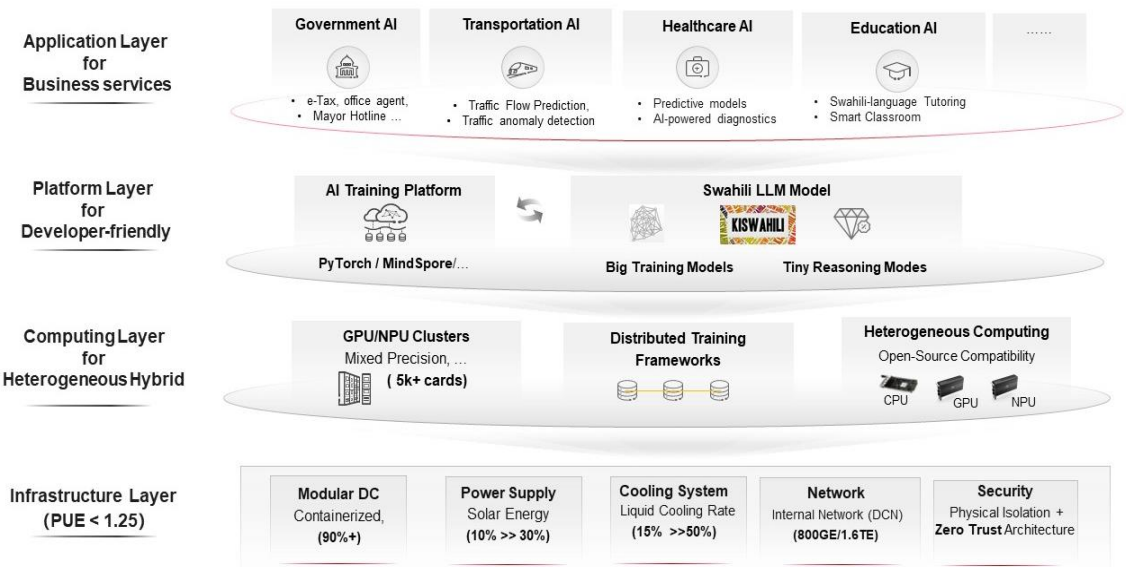

Figure 4.2.1.1. Framework of AI Computing Power Platform 2030

Secondly, the enablement platform can be structured into four typical service layers, referred to as sub-platforms, each designed to meet distinct needs:

Public Computing Sub-platform: Provides scalable computing services tailored for enterprises and government operations.

Application Innovation Sub-platform: Offers innovation capabilities to developers, enabling the creation and enhancement of industry applications.

Talent Development Sub-platform: Serves as a dedicated testbed for universities and R&D institutes, enabling simulation, experimentation, and applied research. At the same time, it functions as a training base for university students to build AI competencies and as a skills-development hub supporting vocational education.

Ecosystem Aggregation Sub-platform: Creates a collaborative space to attract diverse ecosystem partners, integrating end-to-end solutions aligned with the requirements of the Kenyan market

The details are as below：

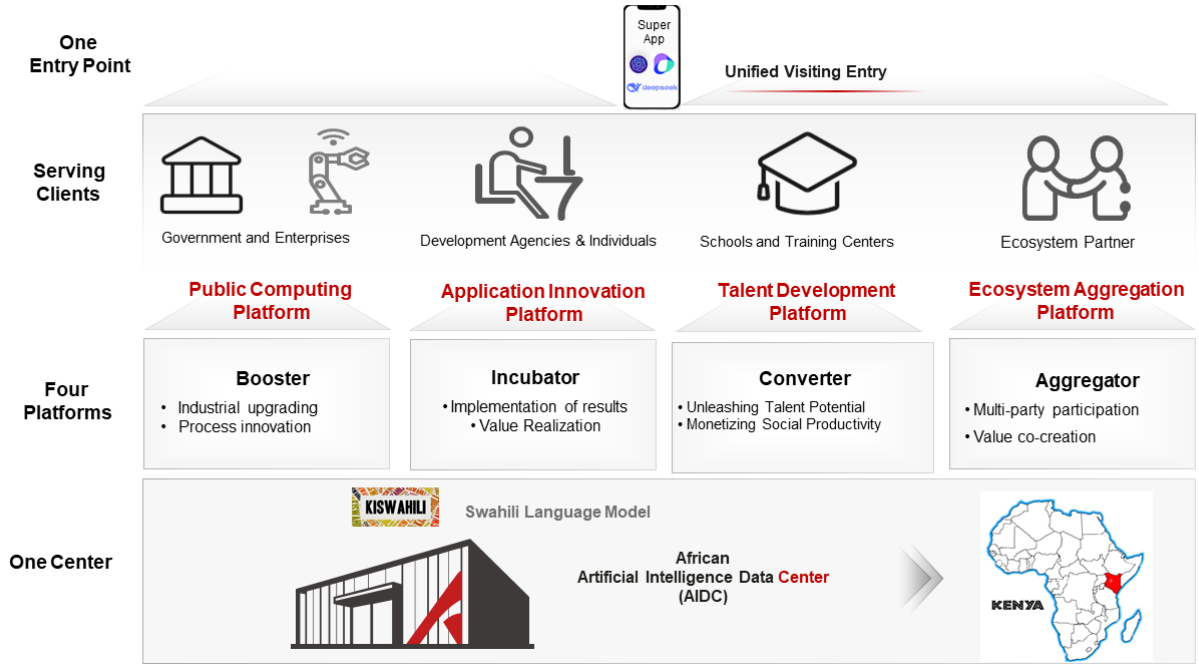

Figure 4.2.1.2. Function Sub-Platform Framework of AI Computing Power Platform 2030

Evolution Roadmap

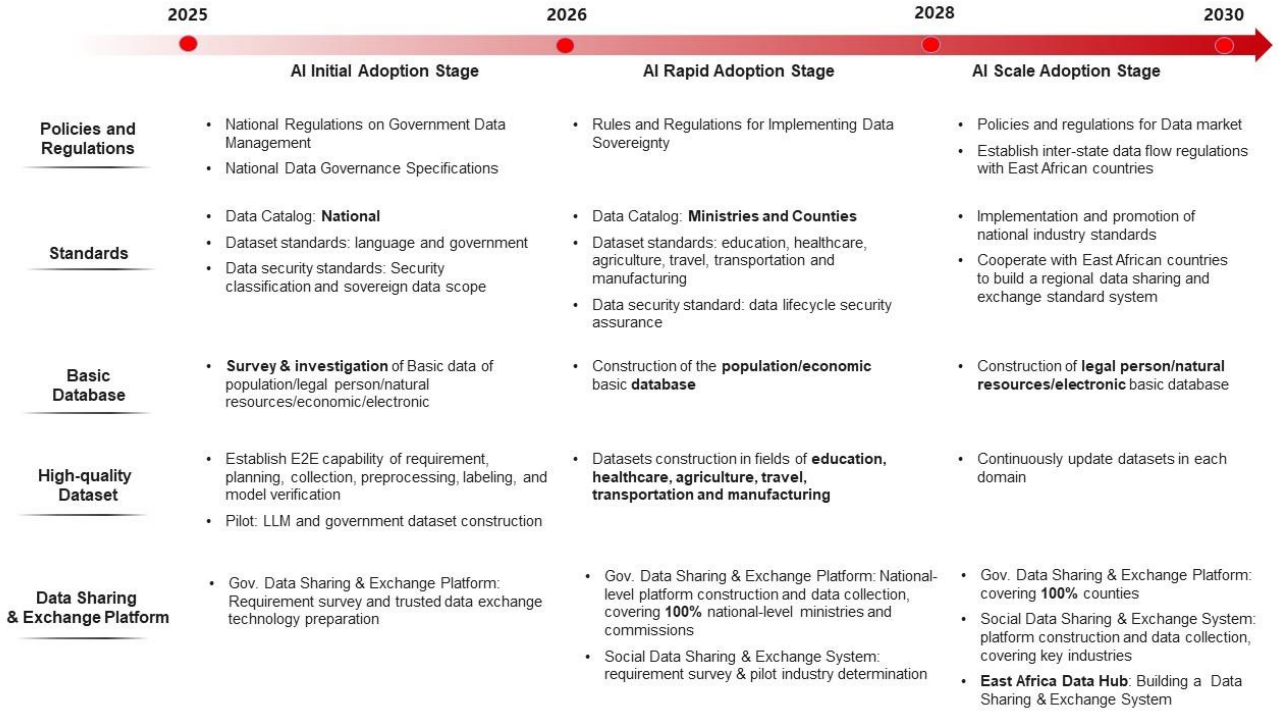

Figure 4.2.1.3. Evolution Roadmap of AI Computing Power Platform 2030

Value Proposition

Kenya's AI Computing Power Platform would deliver transformative value across government, enterprise, research, society, and international cooperation positioning the country as a regional leader in ethical, inclusive, and sustainable AI.

- **For Government:** Enhance public service intelligence (e.g., e-taxation, smart transportation, disaster early warning) and strengthen digital governance capabilities.
- **For Enterprises**: Lower the barrier to AI adoption, support digital transformation of SMEs, and incubate local AI startups.
- **For Research Institutions**: Provide free access to computing power to drive AI-driven research and innovation in agriculture, climate, and public health.
- **For Citizens**: Enable inclusive, AI-powered services such as telemedicine, smart education, and mother-tongue voice interaction.
- **For Regional Cooperation**: Position Kenya as the East African computing hub, enhancing its digital leadership within the East African Community (EAC).
- **For Global Impact**: Build a "Green AI Model for Developing Countries" and contribute African wisdom to global AI governance.

4.2.2 National Data Governance toward 2030

Global Trends

- Over 50% of countries globally have implemented data legal policies, significantly reflecting their commitment to data protection and governance.
- Till 2025, it is projected to grow to approximately 181 zettabytes, with further projections leading towards yottabyte (YB) scale by 2030.
- By 2028, public domain data resources are expected to deplete. The development of large AI models requires "data food," especially high-quality datasets.
- By 2030, the global data element market size is expected to reach $301.1 billion, with CAGR exceeding 15%.
- General AI agents will deepen the mining of data elements, significantly improve the efficiency of data mining.

Kenya Market Insight

- Established a relatively comprehensive legal framework, including the Data Protection Act etc., provide guidance for the development and use of artificial intelligence.
- However, a comprehensive and specific AI regulatory framework has not yet formed, making it is possible to still address challenges of data privacy and security.
- Some limitations in data sharing mechanisms; government data is not fully digitized and remains in silos; gaps in data governance policies regarding data sharing and collaboration limits the government's ability to drive innovation and build AI capabilities.
- Lacks enough data to train AI models, the country scores 44.44% in data availability in the global index.
- Heavily relies on foreign data centres to process and store data generated domestically, which could lead to data exploitation, privacy breaches, and national security threats.

Development Goals for 2030

- Establish and improve a responsive data governance framework, and formulate national data policies and strategies that align with international best practices.
- Develop and implement secure data sharing, data access, and data interoperability protocols, and establish comprehensive national data and metadata standards and protocols to achieve consistency and seamless exchange of data between government ministries and the private sector.
- Encourage the creation of open and high-quality AI training datasets, and develop and implement national data quality standards that cover data collection, cleaning, validation, and integration across various industries.

Innovative Technologies Adoption and Planning Principles

Innovative Technical Adoption:

- **Data Governance Framework**: To Formulate national data policies, establish a legal framework for data sharing, clarify the rights and responsibilities of data authorities & create data security regulations to ensure data classification mechanisms and protection systems.

- **Data Regulations and Standards System**: Strengthening the rights of data subjects and address issues of trust in data subjects. Through top-level legislation on data governance, form a rule system for data flow and utilization to solve the problem of data value release. Develop data standards and directories to ensure that basic public data is unified, sourced from the same origin, and well-documented nationwide.
- **Basic Databases and High-Quality Industry Databases**: Building national-level basic databases for population, legal entities, natural resources, economy, and electronic certificates based on national standards and regulations, Establish thematic databases for healthcare, government services, social security, ecological environment protection, credit systems, and emergency management.
- **Data Sharing and Exchange System**: Building a nationwide integrated data sharing and exchange system covering all levels of government, enabling real-time exchange and minute-level sharing.

Design Principles:

- **Systematic Concept and Coordinated Promotion**: Strengthen overall planning, integrated layout, and holistic promotion, focusing on the entire process of data at all stages, and comprehensively promote data co-construction, co-governance, and sharing.
- **Demand-Oriented and Application-Driven**: Start from actual needs, begin with government management and service scenarios, use business applications to drive data governance, enhance data empowerment, and promote cross-departmental and cross-level business collaboration and applications.
- **Innovation-Driven and Quality Improvement**: Maintain an innovative development concept, actively use new technologies to enhance data governance and service capabilities, and innovate trustworthy data sharing methods.
- **Holistic Coordination and Security Control**: Focus on the security management of the entire data lifecycle, implement the main responsibility for security, use secure and reliable technologies and products, promote the standardized construction of data security systems, and drive the coordinated development of security and utilization.

Kenya National Data Governance Architecture 2030

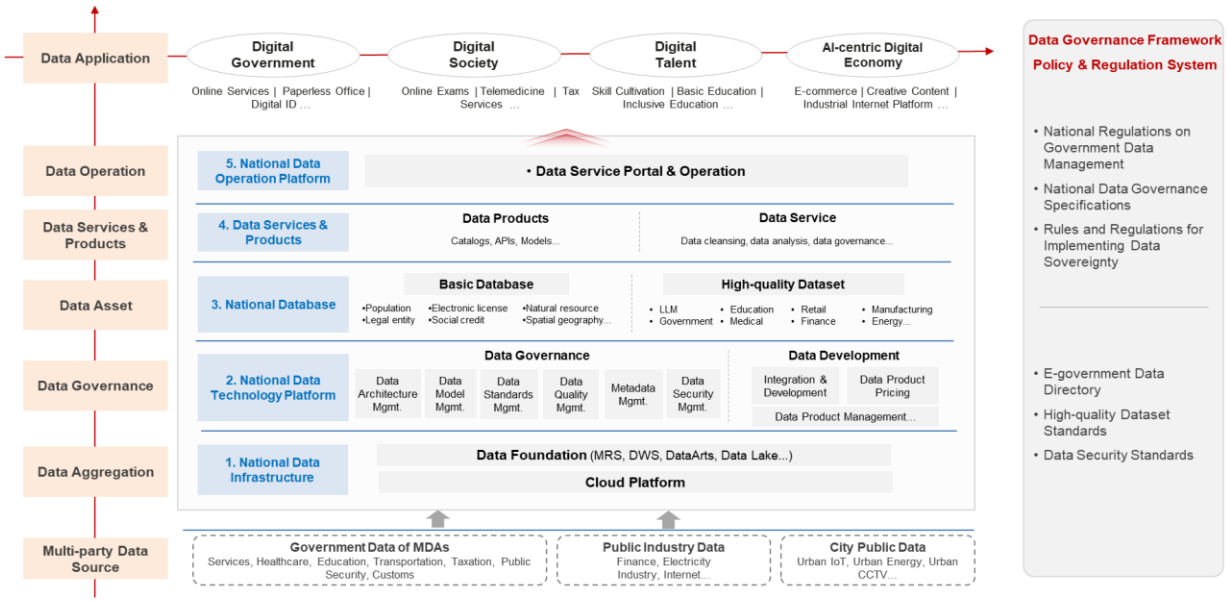

Figure 4.2.2.1. Kenya National Data Governance Architecture 2030

Evolution Roadmap

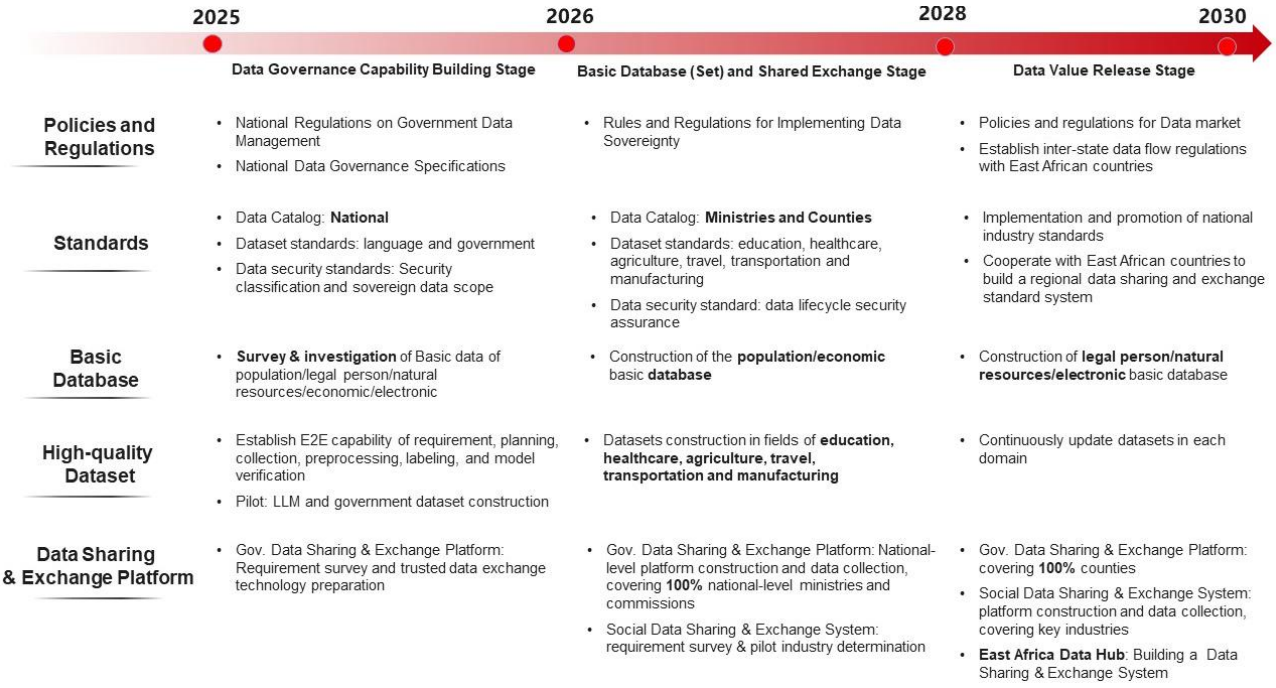

Figure 4.2.2.2. Evolution Roadmap of Kenya National Data Governance Architecture 2030

Value Proposition

- **Safeguarding National Data Sovereignty**: Achieving autonomous control over data governance and security is the cornerstone of national digital sovereignty, ensuring Kenya's strategic autonomy in a complex international environment.
- **Enhancing Data Value**: Establishing a clear system of rights, responsibilities, and benefits through regulatory standards ensures effective sharing and circulation of data, promotes diversified applications of data, enhances national capabilities in governance services, and unlocks the value of data.
- **Promoting the Development of the Artificial Intelligence Industry**: The construction of a high-quality data system provides a continuous fuel for the development of artificial intelligence, drives deep applications across various industries, and promotes the development of the entire industry-academia-research chain of artificial intelligence.
- **Boosting National Digital Competitiveness**: International competition in the digital era focuses on infrastructure, data, and new technologies. A solid data foundation ensures Kenya's core competitiveness in the new development stage.
- **Expanding International Influence**: By enhancing national data governance and sharing and exchange capabilities, Kenya aims to build a "data hub" in the East African region, radiating to other East African countries and promoting regional digital development.

4.2.3 Kenya AI LLM Model towards 2030

Global Trends

- The industry is prioritizing AI as a key investment focus, driving record levels of investment and usage: In 2024, private AI investment in the United States surged to $109.1 billion. Generative AI has shown strong momentum, attracting $33.9 billion in global private investment. The commercial applications of AI are also accelerating.
- The United States continues to lead in the development of top AI models, but China is rapidly closing the gap. In 2024, United States institutions launched a total of 40 influential AI models. While the United States maintains a lead in quantity, the quality of Chinese

models is rapidly catching up. Other countries in Europe and in the Middle East are also developing models

- AI is becoming more efficient, affordable, and widely accessible. From 2022 to 2024, system reasoning costs at the GPT-3.5 level dropped over 280-fold. Hardware costs declined by 30% annually, while energy efficiency improved by 40% per year. Open-source models like DeepSeek and Qwen are rapidly closing the gap with closed-source models, especially in reasoning and programming.

Kenya Market Insight

To date, Kenya has made notable progress, with the government actively driving a wide range of initiatives, such as:

- **Academic institutions actively engage in large model research**: Academic institutions have established laboratories and research centres dedicated to various fields of artificial intelligence and machine learning.
- **Government policies and regulations** encourage national partners to invest in local large model development: Several global tech companies have also set up research centres in Kenya, focusing on the development of local AI models. Microsoft and G42 have pledged to invest $1 billion to build green infrastructure and local language models.

Meanwhile, numerous challenges must be addressed in the next phase e.g.:

- **Digital Infrastructure**: Limited computing power, broadband access, and energy efficiency hinder the deployment and scalability of large models.
- **Talent Shortage**: A lack of advanced AI professionals restricts Kenya’s capacity to train and develop contextually relevant models, slowing national progress in AI.

Development Goals for 2030

According to the Kenya AI Development Strategy 2025-2030, an "AI Innovators Programme" will be launched and implemented to cultivate a robust innovation ecosystem and support the development and experimentation of cutting-edge AI models. The following five measures will be specifically adopted:

- Establish Kenya as a regional hub for local AI model development.
- Strengthen science parks and innovation zones to attract and support technology and AI enterprises and startups.
- Upgrade technology incubation centres to provide guidance and incubation services.
- Develop AI models using local data sources to address key local issues.
- Prioritize the development of inclusive AI models that can solve pressing social problems, particularly edge AI and small AI models.

Technology Innovation and Planning Principles

Technologies Adoption:

- **Technical Preparation**: Model selection, dataset preparation, and professional talent training.
- **Local Large Model Development**: Based on high-quality local datasets, advance the development, training, fine-tuning, and evaluation of localized models.
- **Industry Large Model Innovation**: Encourage interdisciplinary collaboration, promote model fine-tuning across 10+ industries, advance the ratio of industry-specific SFT data to general SFT data, and ensure real-time updates of industry data.

Design Principles:

- **Autonomous Control:** Ensure that national large models are fully controlled under national governance in terms of technology, architecture, data, etc. Implement monitoring and auditing measures to effectively manage and control the use and operation of the models, ensuring the security and controllability of business processes.
- **Open Sharing**: Adhere to open development, maintain an open ecosystem, promote the exchange and cooperation of AI technology globally, and drive the popularization and application of AI technology, allowing more people to benefit from the development of AI technology.
- **Collaborative Innovation**: Encourage the participation of industry, academia, and research sectors to promote independent innovation in large model technology, enhance the core competitiveness in the AI field, and drive the continuous advancement of AI technology.

- **Trustworthy Equality**: Control the "hallucination" issues of large models to ensure that the output results are accurate, reliable, and timely. Guarantee data equality, computing power equality, and equality in tools and ecosystems, enabling different enterprises, institutions, and individuals to equally access and use the resources and tools required for AI development.
- **System Security**: Includes network security, data security, algorithm security, etc. It is necessary to build a full-stack security protection system covering algorithms, data, and deployment.

Kenya AI Large Model Planning Architecture 2030

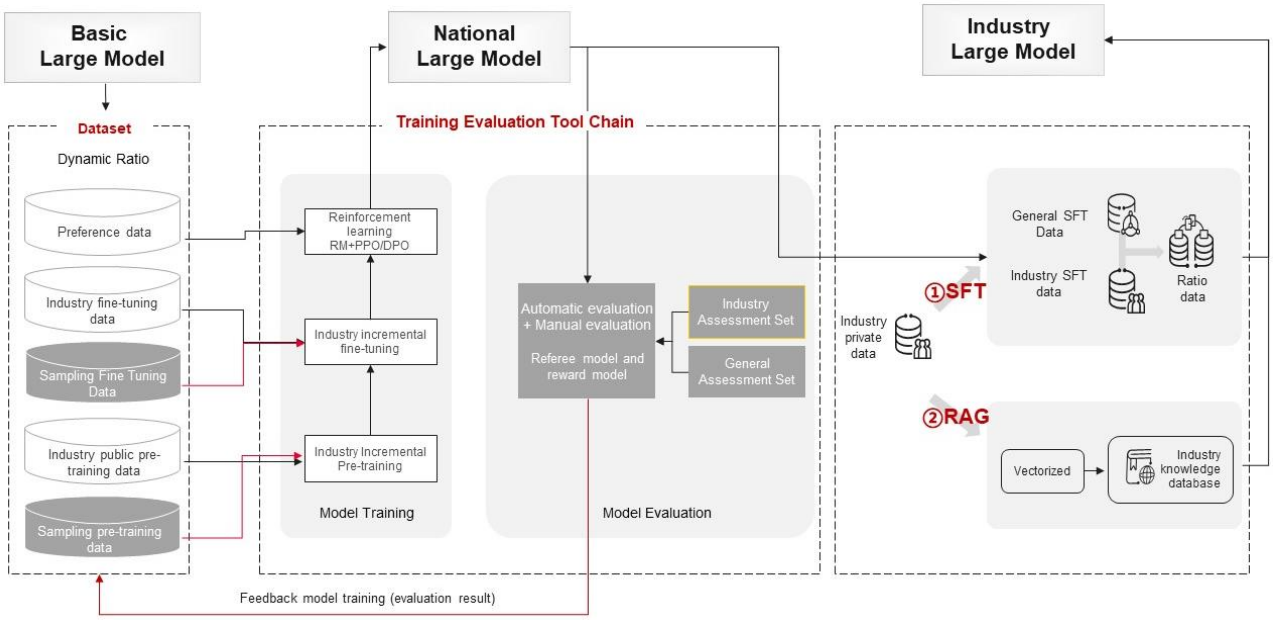

Figure 4.2.3.1. Kenya AI Large Model Planning Architecture 2030

Evolution Roadmap

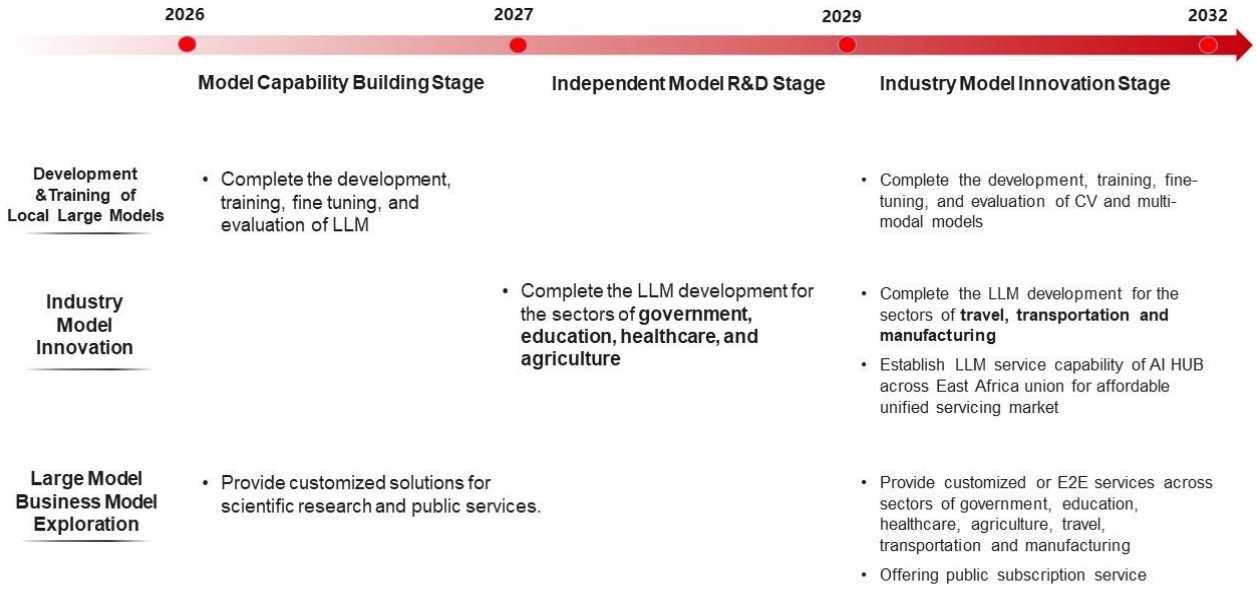

Figure 4.2.3.2. Kenya AI Large Model Planning Architecture 2030

Value Proposition

- **Safeguarding National Digital Sovereignty:** Through independent research and development and localized training, we aim to break free from technological dependencies, avoid potential technological risks, and strengthen "data sovereignty," ensuring Kenya's autonomy in future international technological competitions.
- **Cultural Security and Value Inheritance**: By adapting to local culture, we maintain national cultural sovereignty and ideological security, preventing foreign cultural infiltration. Simultaneously, we utilize large models for the digitization of cultural heritage, aiding in the inheritance and innovation of local culture.
- **Ensuring National Security and Strategic Capabilities**: Large models play an irreplaceable role in military, intelligence analysis, and cybersecurity. Independent large model technology is the baseline for security assurance.
- **Promoting National Cooperation and Inclusive Development**: We aim to promote technological inclusivity and national cooperation, establishing an "East African Digital Hub." Through technology sharing and cooperative development models, we facilitate African countries' access to low-cost AI solutions, fostering regional development.

4.2.4 Data Security Protection Architecture toward 2030

Global Trends

AI-Driven Threats & Defence:

- Generative AI is now leveraged by both attackers and defenders.
- Security teams are shifting focus to protect unstructured data such as text, images, and video used in AI training and inference.

Decentralized & Multi-Cloud Security:

- Organizations are adopting multi-cloud and hybrid architectures, requiring unified security controls across platforms.
- Sovereign cloud models increasing due to geopolitical and data sovereignty concerns.

Tactical AI Security Investments:

- Companies are shifting from broad AI security programmes to targeted use cases with measurable ROI.
- Examples include AI-powered threat detection, automated compliance checks, and secure DevOps pipelines.

Supply Chain & Third-Party Risk:

- Interconnected ecosystems are increasing exposure to supply chain attacks.
- Organizations are investing in vendor risk management and continuous monitoring.

Strategic Implications:

- Security is now a board-level priority not just an IT concern.
- Resilience is critical, especially in finance, healthcare, and government sectors.
- Modern threats demand dynamic, AI-enhanced defences.

Key Challenges

- Each service build security capabilities separately.
- Scattered security investment and repeated development of common capabilities.
- Security capabilities are mixed. Some domains have limited budgets and lack of talent. Security capabilities are short.
- Increasingly severe security risks and security supervision requirements in the future.

Data Security Protection Architecture 2030

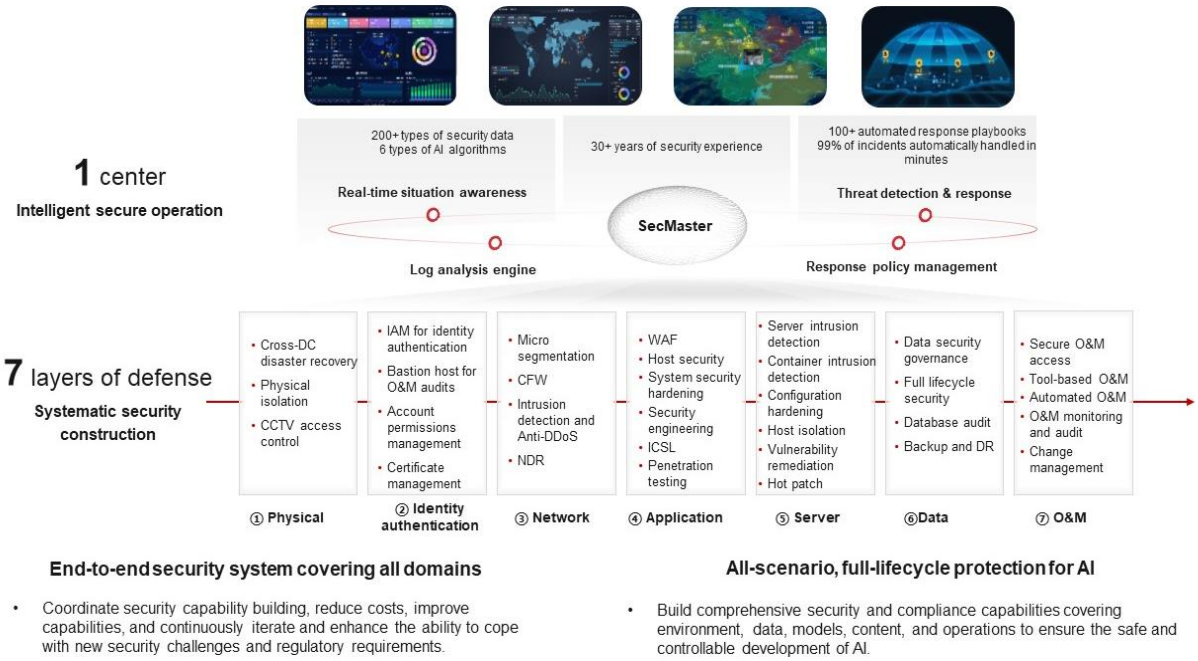

Figure 4.2.4.1. Data Security Protection System Architecture 2030

Evolution Roadmap

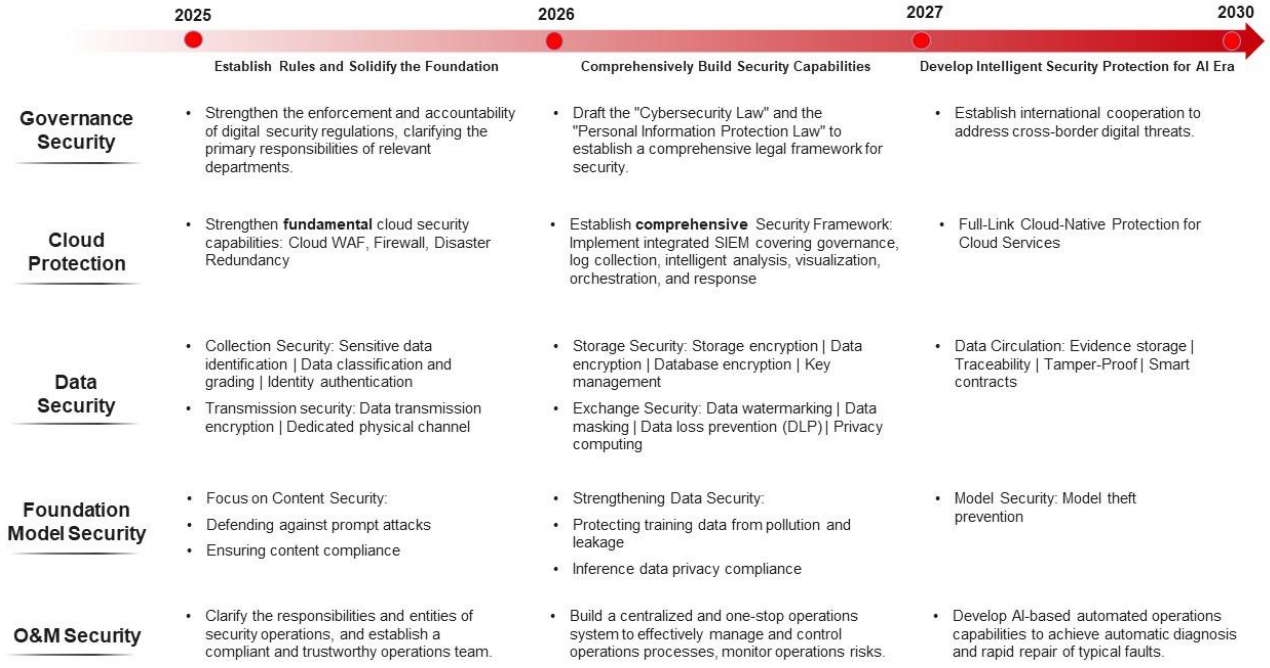

Figure 4.2.4.2. Evolution Roadmap of Digital Security Protection System Architecture 2030

Value Proposition

Digital security's value proposition lies in protecting trust, enabling innovation, and ensuring business continuity in an increasingly connected and threat-prone world. It's not just about defence it's a strategic enabler of growth, resilience, and compliance.

- **Protects trust** by safeguarding sensitive data and digital identities.
- **Enables innovation** through secure cloud, AI, and digital transformation.
- **Ensures resilience** against cyber threats, minimizing downtime and financial loss.
- **Supports compliance** with global regulations and industry standards.
- **Drives efficiency** via automation, secure workflows, and risk-based decision-making.

4.3. Prioritizing the Deployment of Critical Business Applications

Pioneering the application of AI in government affairs can not only significantly enhance the efficiency and transparency of government services, but also improve public experience through intelligent workflows, policy interpretation, and public service responses, creating replicable models for modern governance. As a leader in this field, the government's demonstration effect will accelerate the adoption and popularization of AI technologies across society.

In industry-specific scenarios, the early implementation of AI helps verify the feasibility and stability of the technology, promoting the establishment of industry standards and governance frameworks. Through a "pilot-then-scale" approach, it lays a solid technical and institutional foundation for subsequent large-scale applications.

4.3.1. AI-Driven Public Governance

Empowering Governance with AI

Leverage AI to build a new vision of human–machine symbiosis in social governance. Drive the intelligent upgrading of municipal infrastructure and advance urban planning, construction, and management through next-generation smart terminals. Extend AI products and services to rural areas to promote inclusive urban–rural intelligence. Expand AI applications in government services safely and steadily, creating a model of precise demand identification, proactive service planning, and fully intelligent processing. Accelerate AI adoption in public resource bidding and tendering to enhance efficiency and oversight.

Diversified and Collaborative Security Governance

Establish a public security governance system integrating natural persons, digital humans, and intelligent robots. Strengthen AI applications in production safety, disaster prevention, public security early warning, and social order management. Enhance monitoring, enforcement, decision-making, rescue, and mobilization capabilities to safeguard national

security. Advance AI-enabled cyberspace governance with precise information identification, proactive situational analysis, and real-time risk response.

Continuously, the Digital Intelligent Government will be highlighted as typical examples in the planning framework for your reference.

Global Trends

- According to the 2023 Deloitte Annual Report highlights that numerous of the countries' government worldwide have achieved more than **tenfold improvements** in operational efficiency, customer experience, and work effectiveness through digital government transformation with the AI enablement.
- An increasing number of governments are utilizing artificial intelligence to detect fraud, reduce costs, enhance customer experience, and streamline backend processes.
- Governments are increasingly **relying on data** to make decisions, adopting data-centric approaches to improve service quality and efficiency, and enabling data-driven decision-making.
- Many countries are addressing public issues through **interdepartmental collaboration** to enhance residents' satisfaction. For example, Singapore have improved public services through interdepartmental collaboration and technological ecosystems.
- Governments are increasingly focusing on providing human-centric digital services, integrating online and offline channels to enhance service accessibility and convenient.

Kenya Market Insight

- Kenya has gotten a significant improvement in its digitalization level in recent years, the **EGDI index** has risen from over **the 120th** to around the **100th** across global countries.
- By introducing the World Bank 's Kenya AI-centric digital economy Projects recent years, the Kenya has enhanced the digitalization process across various government sectors, including government office automation (GUC), government IT system and information architecture upgrades (Information System, GEF) etc.

- Continued investment in infra. development has resulted in the establishment of the Konza National Data Centre, which currently supports **more than 100** local government and enterprise units. This centre aims to set a benchmark for diversified funding in Kenya's AI-centric digital economy infrastructure and serve as a regional model.
- The release of the Kenya Cloud Policy and Kenya AI Development Strategy 2025-2030 has promoted the adoption of **cloud services** and the migration of production systems to the cloud by government and enterprises. Kenya is also actively seeking international collaboration to establish an independent **intelligent computing centre**, with the goal of enhancing national data sovereignty in AI development.

Development Goals for 2030

Digital intelligent government is the flagship initiative of Kenya's National Digital Transformation strategy, driven by cloud and AI technologies. Significant expectations have been placed on its success, as outlined below:

- **Universal Digital Identity Secure, inclusive ID systems**: It is used for seamless access to public services and financial platforms.
- **Cloud-First Public Services:** Shift government operations to cloud infrastructure for scalability, efficiency, and security.
- **Interoperable Platforms:** Enable secure data sharing and real-time collaboration across ministries and agencies.
- **Digital Inclusion & Equity:** Expand connectivity and digital literacy, prioritizing rural and marginalized communities.
- **Cybersecurity & Data Sovereignty:** Strengthen national cyber defences and ensure local control over data storage and processing.
- **AI & Emerging Technologies:** Deploy AI-powered services like chatbots and predictive analytics; foster innovation through partnerships.
- **Sustainable Infrastructure:** Promote green ICT and energy-efficient data centres aligned with climate resilience goals.

Innovative Technology Adoption and Planning Principles

Innovative Technologies Adoption:

- **Government Services Digitalization**: Utilizing modern information technologies such as the internet, big data, cloud computing, and artificial intelligence to enhance the efficiency and quality of government public services.
- **Government Data Governance**: The process by which government departments systematically manage and utilize data resources to enhance the efficiency of government management and services.
- **Data Sovereignty**: It refers to a country's control and management rights over data within its territory, and involves all aspects of data generation, storage, flow, analysis, and utilization, ensures that data is protected by laws & policies for national sovereignty.

Planning Principles:

- **People-Centre:** Focus on public needs, enhance service quality and convenience, and promote citizen-friendly initiatives such as “All Services on One Network.”
- **Integrated and Shared Resources**: Break down information silos to integrate data, platforms, and technologies; promote cross-department & cross-level coordinated governance.
- **Reform-Oriented**: Use digital means to drive transformation of the government, optimize governance processes, and improve administrative efficiency & transparency.
- **Data-Driven Enablement**: Strengthen data governance frameworks, promote the integration, openness, and utilization of data resources, and enhance scientific decision-making and precision services.
- **Holistic Coordination:** Build unified architecture and promote systematic integration of technology, business, data to achieve internal and external government collaboration.
- **Secure and Controllable**: Establish comprehensive cybersecurity and data protection mechanisms to ensure safe operation of information systems and data resources.
- **Open Innovation**: Encourage participation from government, industry, academia, research institutions, and users to foster new technologies and policy innovations.

Digital Government ICT Infrastructure Architecture 2030

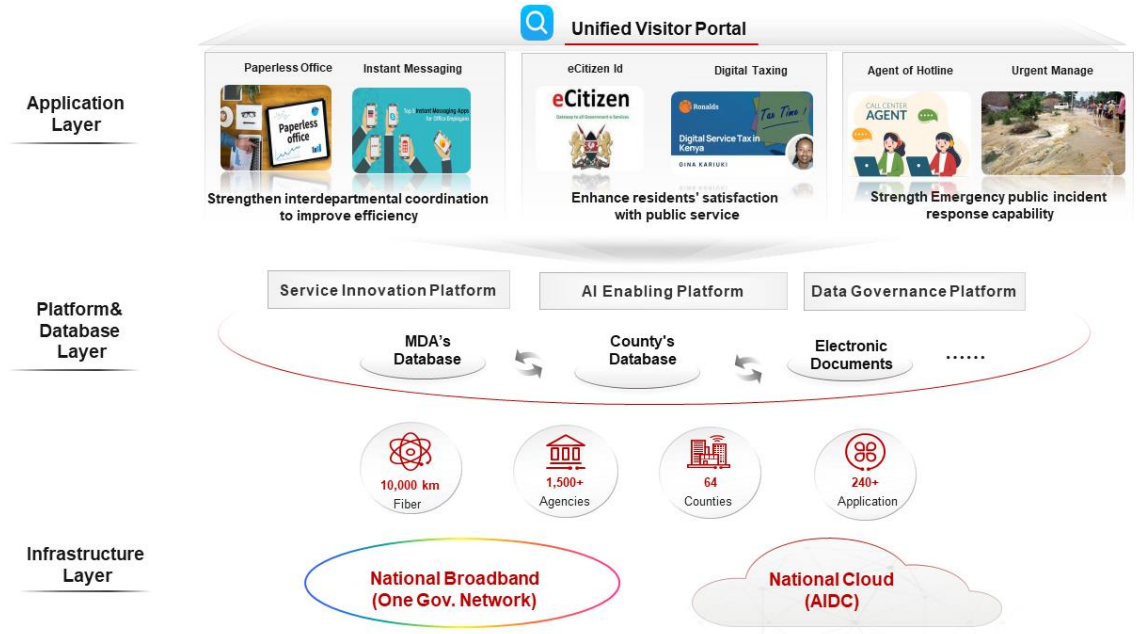

Figure 4.3.1.1. Digital Government ICT Infrastructure Architecture 2030

Evolution Roadmap

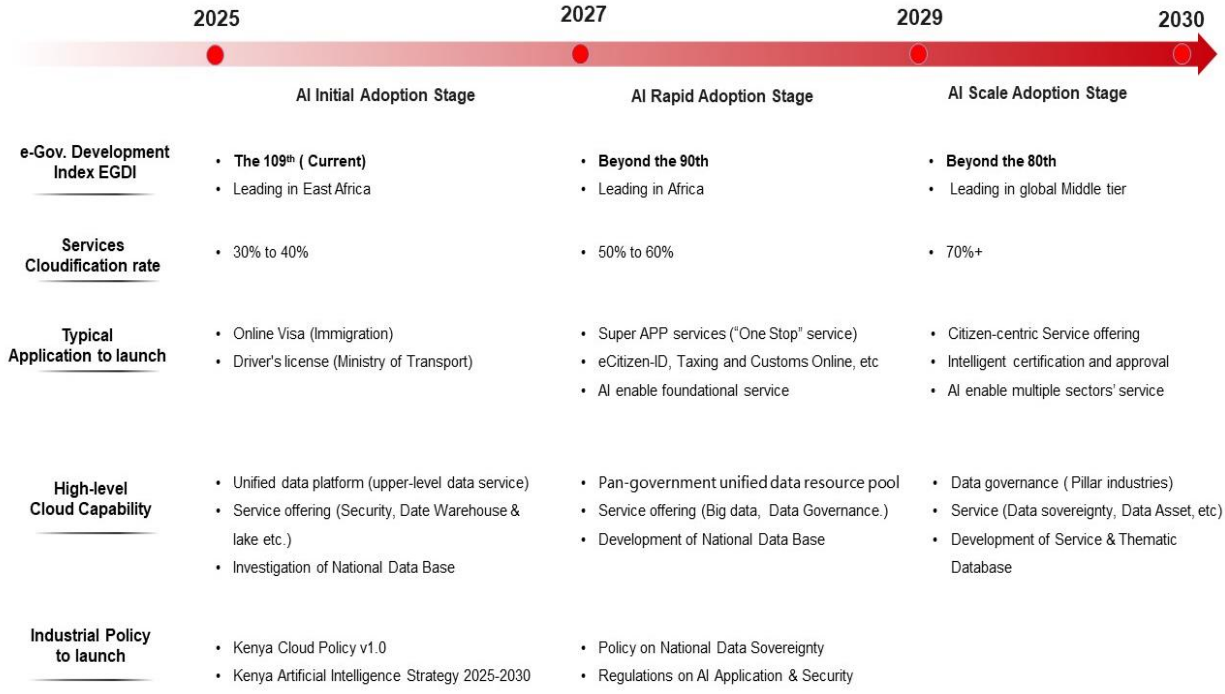

Figure 4.3.1.2. Evolution Roadmap of Digital Intelligent Government ICT Infra. Architecture 2030

Value Proposition

The cloud-first and Data sharing policy can provide guidance for the national digital transformation and achieve the following objectives:

- **Reduce investment costs**: Government cloud services can effectively reduce significant expenditures on IT infrastructure and maintenance costs. Top-tier solutions can be immediately provided to government entities through cloud provisioning.
- **Enhance the manageability and productivity**: The resilience and security of government ICT are improved, and are aligned with the upgrades of hardware and software managed by government cloud service providers.
- **Achieve better integration among services**: It is becoming easier for the government entities to share resources, improve efficiency, and foster creativity in providing public services, more effective collaboration between government entities can be realised.
- **Ensure continuous operations and service recovery**：Centralized, redundant, and localized data storage and backup enable faster and more economical service recovery and data retrieval during crises.
- **Greater agility**：Cloud computing simplifies the development, support, and hosting of ICT solutions, thereby improving service performance and accelerating service deployment.

4.3.2. Empowering Public Welfare with AI Technologies

Creating Smarter Ways of Working: Leverage AI to generate new jobs and empower traditional roles. Explore innovative organizational models for human–machine collaboration, foster intelligent work forms, and apply AI in labor-shortage and high-risk environments. Expand AI skills training to drive innovation, entrepreneurship, and reemployment.

Promoting More Effective Learning: Integrate AI across education systems and processes. Develop collaborative models such as intelligent learning companions and AI teachers, shifting focus from knowledge transfer to capability development. Scale personalized teaching to improve quality and equity, and build intelligent interactive scenarios to enrich self-directed learning.

Building a Higher-Quality Life: Ensure universal access to AI-enabled health assistants. Advance AI in diagnosis, health management, and insurance services to strengthen primary healthcare. Harness AI to enrich cultural production, expand dissemination, and foster exchange. Support AI-assisted creation of cultural content, including Swahili heritage, to grow the cultural industry.

Continuously, the **Digital Village, Smart Education, and Smart Healthcare** will be highlighted as typical examples in the planning framework for your reference

4.3.2.1 AI-Powered Digital Village

Global Trends

Global digital village development is accelerating, with trends focused on connectivity, localized innovation, inclusive services, and sustainability driven by national strategies and multilateral support.

- **AI-Enabled Rural Services**: Countries are deploying AI for crop diagnostics, disease prediction, and personalized learning tailored to local languages and contexts.
- **Digital Literacy & Inclusion Programmes**: Governments are investing in training programmes to equip rural populations especially women and youth with digital skills.
- **Data-Driven Rural Governance**: Villages are using digital tools for land records, resource planning, and citizen feedback improving transparency and service delivery.
- **Public-Private Partnerships**: Telecoms, agri-tech firms, and cloud providers are co-developing rural platforms combining infrastructure, content, and services.
- **Edge Computing for Real Time Access**: Lightweight, localized compute nodes are being installed to support telemedicine, smart irrigation, and offline digital services in remote areas.

Kenya Market Insight

Current Situation:

Kenya's digital village initiatives aim to bridge the digital divide and empower rural communities through access to ICT services, education, and economic opportunities.

- Launched in 2010, Kenya's Digital Village Projects (DVPs) were initiated by the Kenya ICT Authority to address disparities in ICT access between urban and rural areas.
- These centres, also known as Pasha Centres, provide internet access, digital training, e-government services, and business support to underserved communities.
- The goal is to economically empower rural populations by improving communication, access to information, and digital literacy.

Development Challenge:

- **Low Electricity Coverage in Rural Areas**: Despite Kenyan government's vigorous efforts to expand electricity access by raising the national rate, but over 75% coverage in rural areas remains only 65%.
- **Wireless network bandwidth** needs further enhancement in rural areas: Kenya's national wireless coverage currently stands at 94%, indicating there is still space for improvement.
- **Uneven Distribution of Educational Resources**: Educational progress in rural areas remains sluggish, marked by a stark urban–rural divide. Rural primary schools face an average student–teacher ratio of 1:45, rising to 1:60 in remote regions—driving higher dropout rates and hindering both rural development and national talent cultivation.
- **Inadequate Rural Healthcare System**: 30% of rural clinics lack stable electricity (relying on solar power or generators), and only 15% are equipped with neonatal incubators.

Development Goals for 2030/ 2032

Kenya's digital village strategy is part of the Kenya National Digital Master Plan 2022–2032, which outlines a comprehensive roadmap for digital transformation. The main goals include:

- **Expand electricity supply in rural areas：** Plans to connect 460 trading centres, 110 secondary schools, and other public facilities.

- **Expand ICT Access**: Establish 1,450 village digital hubs to provide internet, e-services, and digital training. Lay 100,000 km of fibre optic cable to connect rural schools, clinics, and businesses. Ensure full broadband coverage for all health facilities nationwide.
- **Achieve full coverage** of the national broadband network for all health facilities
- **Integrate information technology** into the curriculum and provide teacher training to effectively apply technology in classroom instruction

Innovative Technology Adoption and Planning Principles

Innovative Technologies Adoption:

- **Digital Infrastructure**: Construct off-grid photovoltaic power stations in rural areas to address electricity supply challenges and lay the foundation for the digitalization of connectivity, education, and healthcare services.
- **Smart Classroom:** Establish smart classrooms using multimedia teaching tools, live-streamed and recorded lessons, and digital teaching platforms to address the shortage of qualified teachers in rural areas and share high-quality educational resources.
- **Smart Healthcare:** After solving electricity and internet access issues, develop smart healthcare systems featuring video conferencing tools to enable remote consultations and the sharing of quality urban healthcare services. Deploy general practitioner workstations to provide essential medical diagnostic services to rural residents.
- **Rich fully Digital Applications**: Launch digital solutions such as e-commerce platforms and systems for rural governance and public administration.

Planning Principles:

- **Bridging the Digital Divide**: To narrow the digital divide between urban and rural areas, solve the problems of rural information blocking and education lag. Through the construction of information infrastructure, create a foundation for "man modernization".
- **Improving Public Services**: To support the modernization of rural governance, make the rural governance multi-subject and transparent, public affairs open on the network platform, and build a harmonious Village, and improves rural residents ‘access to public services such as education, health care etc. through digital technologies.

- **Promoting Economic Development**: E-commerce platform provide a "24-hour market" that is not limited by time and geographical area for agricultural products market, and expand sales channels. Extension of financial services: Promote financial organization provide digital and inclusive financial services, such as online payment, mobile payment, and online credit.
- **Improving Industry Efficiency**: Promotes the restructuring of rural industrial systems, upgrades industrial chains, and improves the energy efficiency of agricultural industries. Deeply integrate digital technologies and traditional industries, empower traditional industries with digital technologies.

Digital Village ICT Infrastructure Architecture 2030

From Connecting Village to Prosperous Village: Kenya's digital village architecture by 2030 is not just about connectivity but it's about enabling prosperity through inclusive, intelligent, and resilient infrastructure.

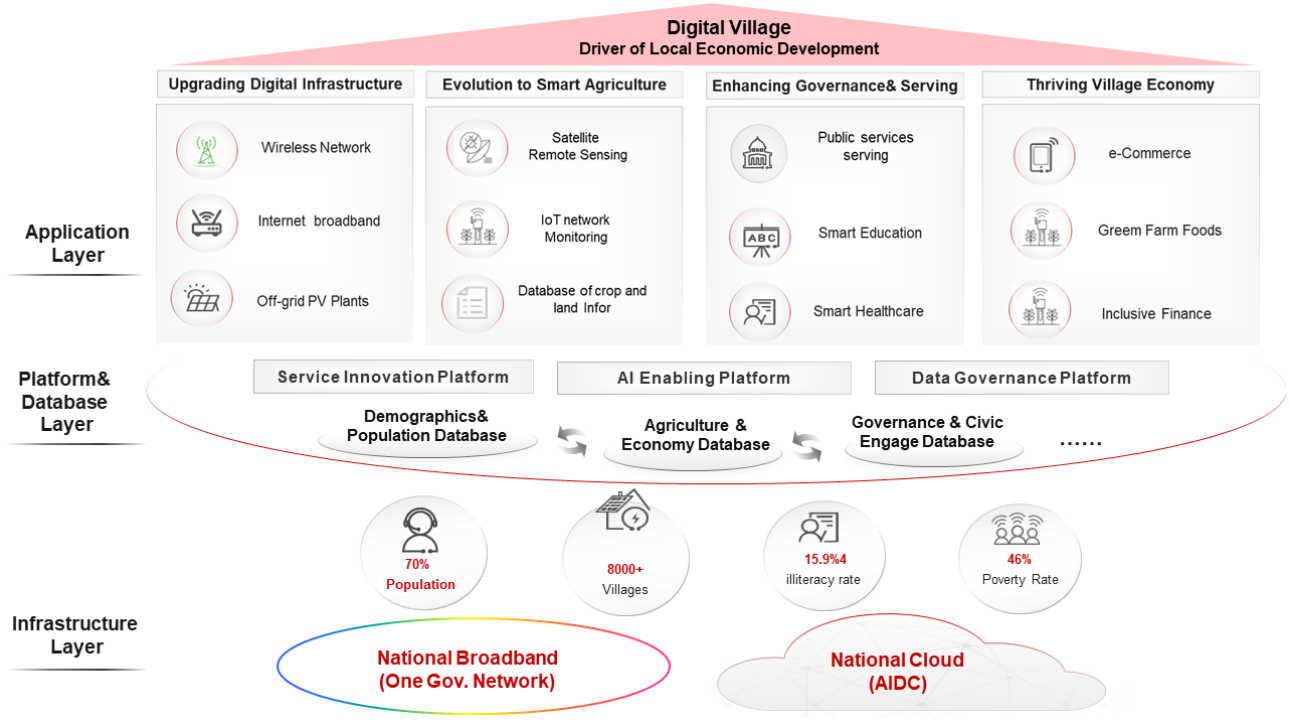

Figure 4.3.2.1.1. Digital Village ICT Infrastructure Architecture 2030

Evolution Roadmap

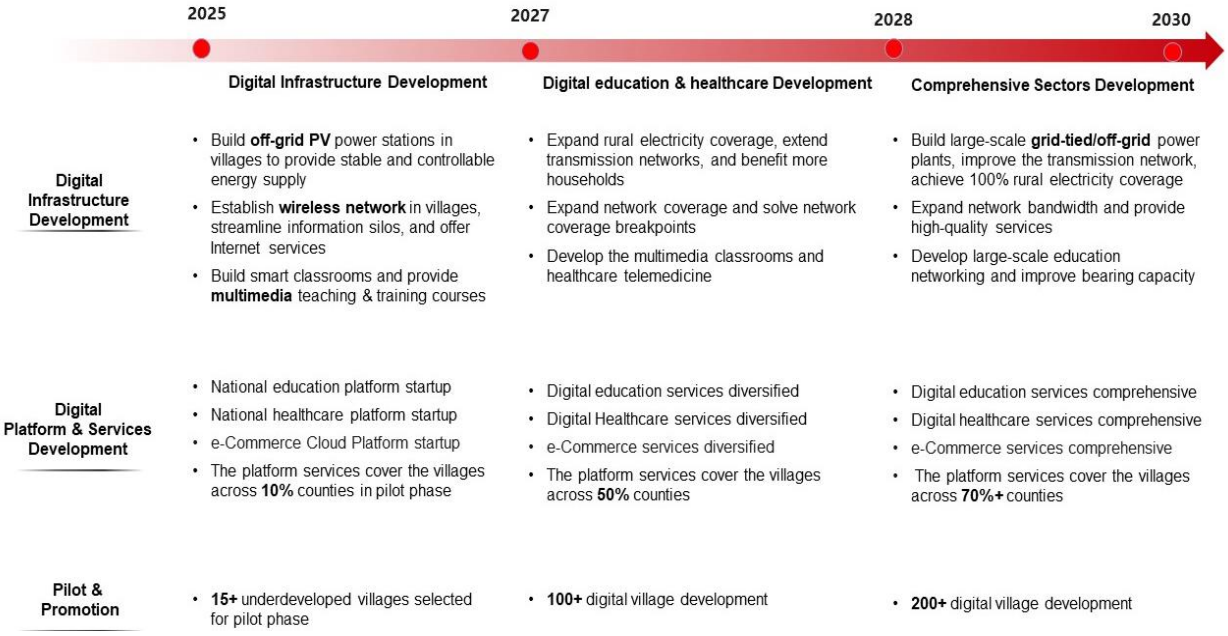

Figure 4.3.2.1.2 Evolution Roadmap of AI-Driven Digital Village 2030

Value Proposition

The value of digital rural construction is reflected in the following aspects:

- **Improving People's Livelihood**: By building off-grid power stations, wireless base stations, smart education, and smart healthcare in rural areas, the living conditions of residents are significantly improved, providing them with development opportunities.
- **Luminating the Future**: By advancing education and healthcare, the knowledge level and physical fitness of the population are enhanced, laying the foundation for national development.
- **Promoting Economic Growth**: The development of digital rural areas and the improvement of network coverage lay the cornerstone for the growth of the AI-centric digital economy.
- **Enhancing National Image**: By implementing the United Nations SDG development plan and realizing the national vision for 2030, the international image is effectively enhanced, gaining greater support in various fields such as capital introduction.

4.3.2.2 AI-Powered Smart Education

Global Trends

- **Digital Transformation of Learning Environments:** Integration of Cloud, AI, VR/AR, and big data analytics into classrooms enables personalized learning through adaptive technologies.
- **Infrastructure & Connectivity Expansion：** Investments in broadband and digital devices especially in underserved areas aiming to close the digital divide and ensure universal access.
- **Data-Driven Governance & Assessment：** Public datasets and smart indicators are used to monitor progress, improve transparency, and strengthen accountability in education systems.
- **Teacher Empowerment & Capacity：** Building Educators are being trained to use digital tools effectively, shifting their roles from content delivery to facilitation and mentorship.
- **Equity, Inclusion & Sustainability：** Smart education systems are designed to be culturally responsive, accessible, and inclusive—supporting gender equity, disability access, and multilingual learning.
- **Policy-Driven Innovation**: Governments are developing national smart education strategies to enhance equity, quality, lifelong learning, and digital literacy.

Kenya Market Insight

Current Situation:

Kenya's leading universities are directing ICT investment toward **network upgrades, platform integration, and smart applications**. While most campuses connect to the national backbone via **KENET** (Kenya Education Network) with gigabit or 10-gigabit fiber, internal Wi-Fi remains a bottleneck requiring urgent improvement.

Software and services are another priority, including learning management systems, digital libraries, and research cloud platforms. Libraries are evolving into dynamic learning hubs, while AI-ready infrastructure and training programs are emerging as new investment areas.

As East Africa's most advanced research and education network, **KENET** links over 200 universities, research institutions, and hospitals, providing high-speed internet and dedicated academic services. It plans to raise **USD 200 million over five years** to expand and upgrade campus networks.

Beyond connectivity, KENET fosters innovation through initiatives such as remote surgical training, research funding in computer science, and community network projects.

Overall, Kenya's education ICT is shifting from backbone connectivity to campus-level upgrades, while data centers and a "cloud-first" policy are driving adoption of **SaaS** and **PaaS**, reshaping procurement and deployment models.

Development Goals for 2030

Kenya's national education development vision is rooted in its long-term national blueprint, Vision 2030, which aims to transform the country into a middle-income economy through educational reform. Within this framework, **the National Education Sector Strategic Plan (2023–2027)** serves as the core guiding document for education development in the current phase. The plan sets out a clear roadmap for 2023 to 2027, committed to providing accessible, equitable, and high-quality education and training, while emphasizing the full development of every learner's potential, regardless of background or ability.

The strategic plan outlines **five key objective**s, ranging from expanding access to quality education and research opportunities to enhancing educational excellence and strengthening governance and accountability. These objectives are closely aligned with the government's Bottom-Up Economic Transformation Agenda, jointly steering education policy, program implementation, and budget allocation over the coming years.

Kenya has **made notable strides** in education over the past two decades. Here's a concise overview of key achievements:

- Kenya's Digital Literacy Programme (DLP) has delivered over 1 million devices to schools.
- Platforms like KICD, eLimu, and M-Shule offer curriculum-based and mobile learning, expanding access in underserved areas.

Development Challenges:

- **Limited access to devices**：The lack of personal learning devices among many students continues to limit equitable access to digital education.
- **Teacher training Gaps**: The professional development programmes for digital skills remain limited, slowing the integration of tech in classrooms.
- **Data Privacy & Security**: The weak infrastructure and limited awareness create vulnerabilities in protecting student data and digital platforms.
- **Monitoring & Evaluation deficit**：there is a lack of effective systems to track progress and impact of digital education initiatives at scale.

Development Goals for 2030

Kenya is advancing a comprehensive digital education agenda as part of its National Digital Transformation strategy. Key pillars include:

- **Universal Connectivity**: All public schools are mandated to have high-speed broadband by 2030, with programming introduced as compulsory in primary & secondary education.
- **Early Digital Literacy**: ICT is embedded from Grade 1 under the Competency-Based Curriculum (CBC), ensuring students develop foundational digital skills from an early age.
- **Smart Learning Environments**: Public schools are being equipped with smart classrooms featuring interactive whiteboards and high-speed internet to enhance teaching and engagement.
- **Inclusive E-Learning Platforms:** Tools like KICD, eLimu, and M-Shule are expanding access to digital content, supporting the goal of inclusive and equitable education for all.

Innovative Technology Adoption and Planning Principles

Innovative Technologies Adoption:

- **Inclusive Digital Content**: Develop multilingual and culturally relevant educational materials to better serve diverse learners across regions.
- **Monitoring & Evaluation systems**: Establish frameworks to track implementation, measure impact, and continuously improve digital education programmers.

- **Parental & Community engagement**: Empower families and communities through digital literacy initiatives and open access to learning platforms.
- **Sustainability Planning:** Promote eco-friendly digital solutions and long-term investment strategies for maintaining education technology infrastructure.
- Planning Principles:
- **Equity & Inclusion**: ensure access to quality education for all learners, regardless of location or background
- **Student-Centred**: Learning focus on personalized, adaptive learning experiences that cater to individual needs, interests, and pace.
- **Technology Integration**: leveraging digital tools like AI, cloud computing, and IoT to enhance teaching, learning, and administration.
- **Data-Driven Decision Making:** Using analytics to monitor progress, inform instruction, and improve educational outcomes
- **Collaborative Ecosystem**: Encouraging partnerships among governments, educators, tech providers, and communities to co-create solutions

Smart Education ICT Infrastructure Architecture 2030

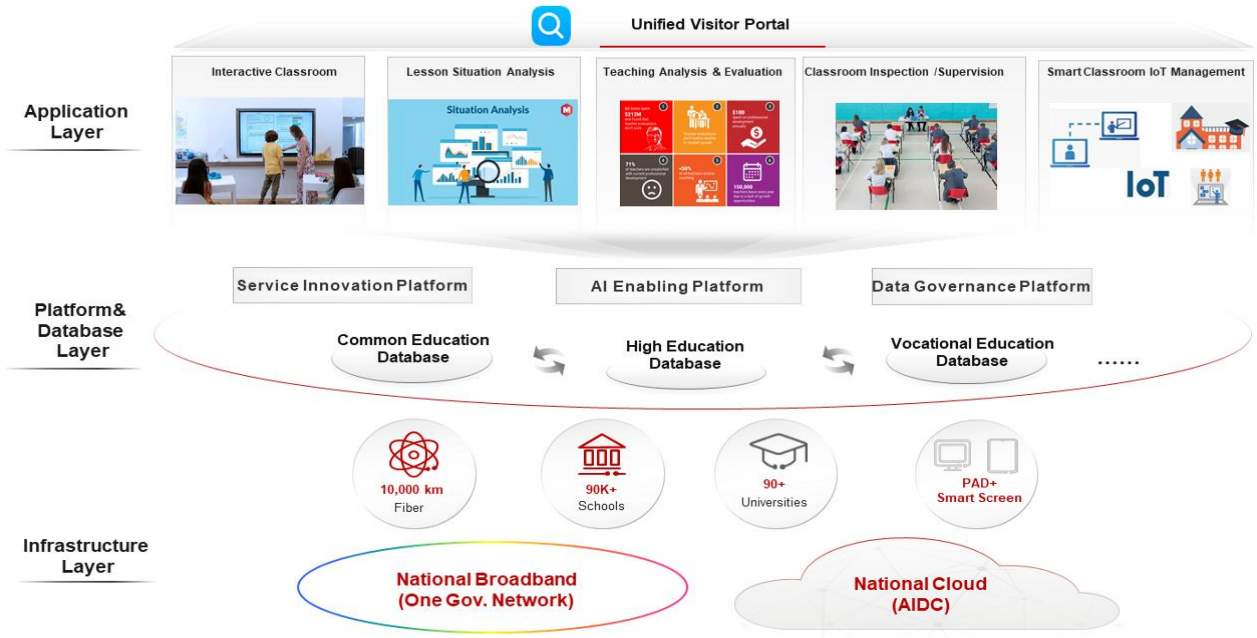

Figure 4.3.2.2.1. Smart Education ICT Infrastructure Architecture 2030

Evolution Roadmap

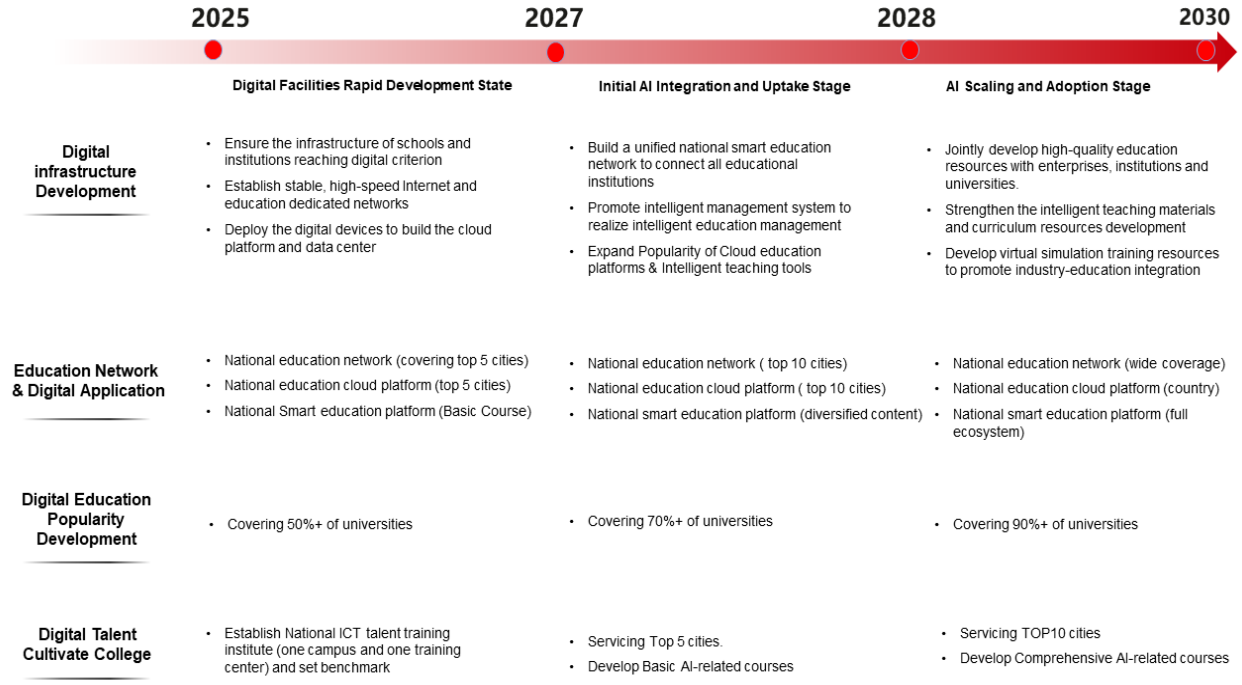

Figure 4.3.2.2.2. Evolution Roadmap of Smart Education 2030

Value Proposition

The value of smart education to customers is reflected in the following aspects:

- **Enhancing Educational Quality**: Smart education improves teaching effectiveness through digital and intelligent means, providing personalized learning experiences that help students better grasp knowledge and skills.
- **Promoting Educational Equity**: Leveraging the internet and digital technologies, smart education can overcome geographical and economic barriers, offering equal educational opportunities to students everywhere and narrowing the gap in educational resources.
- **Driving Economic Development**: Smart education cultivates talents who are adaptable to future technological and economic demands, fostering innovation, entrepreneurship, and enhancing the country's competitiveness and economic development potential.
- **Enhancing International Influence**: Developing smart education helps elevate a country's influence in the global education sector, promotes international cooperation, shares high-quality educational resources, and boosts the nation's soft power.

- **Optimizing Educational Resource Allocation**: Through data analysis and intelligent management, smart education can allocate educational resources more efficiently, improving the overall efficiency and effectiveness of the education system.

4.3.2.3 AI-Powered Smart Healthcare

Global Trends

- **Accelerated Digital Transformation**: The focus is shifting toward generative AI, which is being applied to automate administrative processes and assist in clinical diagnostics, ultimately driving higher returns on investment.
- **Intelligent Healthcare to Address Workforce Shortages**: With a growing global shortage of healthcare professionals, many institutions face recruitment challenges. Existing staff spend excessive time on administrative tasks, leaving limited time for direct patient care. In the future, AI tools will be essential to free up healthcare workers' time and improve efficiency
- **Transformation of Patient Experience**: As medical technologies advance, healthcare institutions are increasingly prioritizing patient experience. The demand is evolving from "disease treatment" to "whole-journey health management." There will also be a stronger emphasis on value-based care, shifting resources toward preventive healthcare rather than simply treating illness.
- **These trends highlight how digital technologies are profoundly reshaping the structure** and delivery of global healthcare, opening new possibilities for achieving universal health coverage.

Kenya Market Insight

Current Situation:

- **Urban-Rural Digital Divide**: Digital healthcare initiatives are concentrated in urban areas, while remote regions suffer from resource scarcity, further exacerbating their already limited medical infrastructure.

- **Resource Shortage**: The physician density stands at 0.29 per 10,000 people, with rural areas having only one-fifth the density of urban regions. (For comparison, the WHO standard is 3 per 10,000 people.)
- **Dual Disease Burden**: A surge in both infectious diseases and chronic illnesses now accounts for over 50% of hospitalized patients.

Development Goals for 2030

1. Universal Health Coverage (UHC) Enablement

- Leverage digital platforms to expand access to quality healthcare across urban and rural areas.
- Use AI and data analytics to improve health outcomes and resource allocation.

2. National Digital Health Strategy (2025–2028)

- Develop a costed, multi-stakeholder roadmap led by the Ministry of Health and supported by partners like PATH and CDC TAP.
- Align digital health priorities with Kenya's broader socioeconomic and public health goals.

3. Smart Health Infrastructure

- Deploy digital public infrastructure for patient registration, health records management, and service tracking.
- Integrate FHIR-based standards to ensure interoperability across platforms and institutions.

4. AI Skilling and Workforce Development

- Through the AI Skilling Initiative (AINSI), train healthcare professionals, civil servants, and policymakers in AI literacy and digital transformation skills.
- Establish Regional Centres of Competence for structured bootcamps and online programmes.

5. Regulatory and Ethical Frameworks

- Introduce Digital Health Regulations 2025 to govern patient data protection, service quality, and ethical AI use.

- Ensure compliance with global standards while tailoring to Kenya's local context.

6. Inclusive and Equitable Access

- Prioritize underserved communities through mobile health platforms, remote diagnostics, and telemedicine.
- Promote gender-responsive and youth-inclusive digital health solutions.

Innovative Technology Adoption and Planning Principles

Innovative Technologies Adoption:

- **Generative AI:** Automates clinical documentation, billing, and diagnostics to boost efficiency and ROI.
- **Edge Computing:** Enables real-time data processing from wearables and sensors for faster, localized decision-making.
- **Digital Twins**: Simulate patient conditions and hospital operations to optimize treatment and resource management.
- **Ambient Sensing**: Smart ICUs and wards use voice, motion, and biometric sensors for non-intrusive patient monitoring.
- **Advanced Telehealth**: AI-enhanced platforms support remote triage, chronic care, and mental health services.

Planning Principles:

- **Digital Infrastructure Development:** Ensure that all hospitals — especially those in remote areas — have reliable internet access and digital equipment. Smart wards and intelligent ICUs can enhance the quality of medical resources.
- **High-Quality Resource Sharing**: Establish remote medical consultation channels between urban and rural hospitals. By leveraging partner capabilities, build robust telemedicine systems to improve accessibility to healthcare resources.
- **Cost Reduction and Efficiency Improvement:** Utilize AI-assisted diagnostics and rapid image interpretation to address labor shortages in the healthcare sector. These technologies enable more efficient and higher-quality patient care while reducing time and labour costs for medical institutions.

Smart Healthcare Tourism ICT Infrastructure Architecture 2030

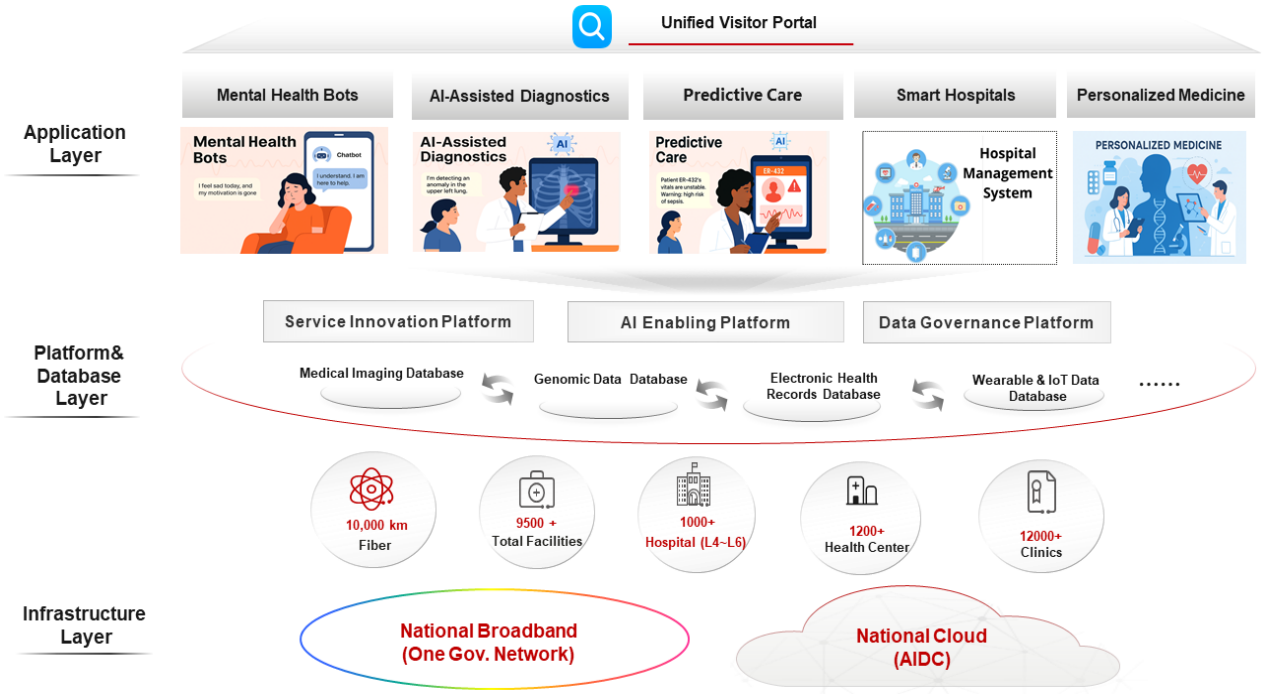

Figure 4.3.2.3.1 Evolution Roadmap of Smart Healthcare 2030

Evolution Roadmap of Tourism ICT Infrastructure Architecture 2030

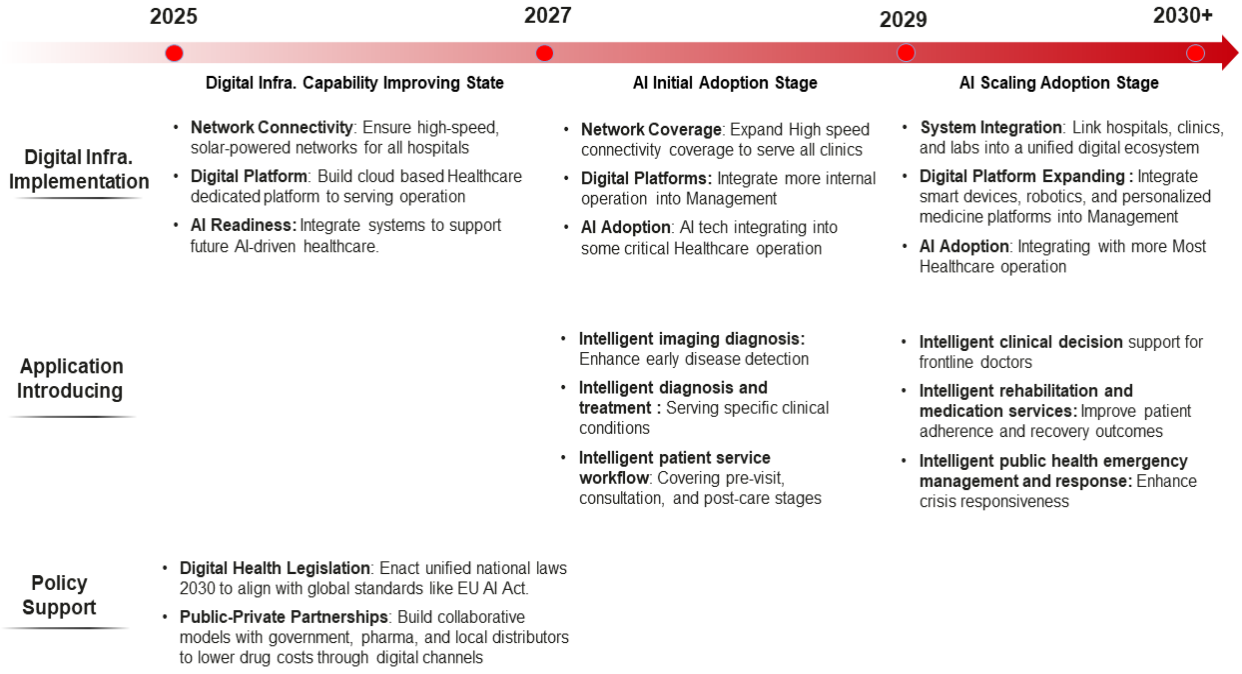

Figure 4.3.2.3.2 Evolution Roadmap of Smart Healthcare 2030

Value Proposition

- **Better Health Outcomes**: Early detection, faster treatment, and real-time disease monitoring improve public health and reduce mortality.
- **Cost Efficiency**: Automation and AI reduce administrative burdens, optimize resources, and lower healthcare spending.
- **Equitable Access**: Telemedicine and digital platforms extend quality care to rural and underserved areas.
- **Workforce Relief**: Intelligent tools ease clinician workloads, reduce burnout, and improve service quality.
- **Innovation & Growth**: Stimulates health-tech industries, attracts investment, and enhances global competitiveness.

4.3.3 AI-Driven Vertical Industry Digital Transformation

Artificial intelligence is becoming a core driver of industrial upgrading. Through automation, predictive analytics, and intelligent scheduling, AI significantly enhances productivity and reduces operating costs. At the same time, it continues to generate new products, services, and business models, fueling the growth of strategic emerging industries and future sectors. Enterprises leverage AI in data analysis and risk management to make more precise decisions, thereby strengthening competitiveness.

Moreover, **AI is enabling large-scale personalized services** in retail, finance, and education, improving user experience and value creation. More importantly, it is driving deep cross-industry integration, forming new ecosystems such as “AI + Tourism,” “AI + Agriculture,” and “AI + Transportation,” injecting continuous innovation and collaborative momentum into socio-economic development.

Continuously, the Smart Tourism, Smart Transportation will be highlighted as typical examples in the planning framework:

4.3.3.1 AI-Driven Smart Tourism:

Global Trends

The current global tourism industry is experiencing a strong trend towards digitalization and intelligence, with a significant number of innovative technologies being applied. The more notable characteristics are as follow:

- **Market Prediction**: Big data and AI help national tourism centres better predict tourist behavior and preferences, enabling personalized services and optimized resource allocation.
- **Better Experience**: The VR and AR technologies offer immersive experiences tourists can preview destinations via VR or access real-time, interactive content on-site through AR.
- **Full Connectivity**: The 5G networks provide high-speed, low-latency connections, supporting advanced applications like real-time translation, smart navigation, and autonomous tourist vehicles.
- **Smart Management**: Improves operational efficiency and visitor satisfaction by integrating data. Tools like intelligent ticketing and crowd monitoring help manage tourist flow and reduce congestion.

Kenya Market Insight

Current Situation:

- **Good performance**: In 2024, international arrivals hit a record 2.4 million and up 15% from 2023 with generating Kshs 452.20 billion, a 19.79% year-on-year increase.
- **Digital Platforms**: Kenya Tourism Board enhanced online visibility through virtual tours, targeted campaigns, and booking tools.
- **Data-Driven Recovery**: Post-COVID strategies used real-time analytics and digital marketing to rebuild demand.
- **Integrated Ecosystems**: Aggregator platforms unify hotels, transport, and experiences for seamless tourist access.

- **Mobile & Social Media**: Strong use of apps and social media to promote destinations and engage travelers.
- **SME Enablement**: Training programmes boost digital skills for small tourism operators.
- Development Challenge:
- **Limited Tech Infrastructure**: Remote areas face poor internet access, hindering online bookings, virtual tours, and digital payments. High-speed connectivity remains concentrated in urban centres.
- **Digital Skills Shortage**: Tourism SMEs, especially community-led initiatives, often lack expertise in digital marketing, data analytics, and platform management. Structured training is limited, slowing tech adoption.
- **Fragmented Platforms**: Tourism platforms lack unified standards and data-sharing protocols, resulting in inconsistent user experiences and integration issues.
- **Cybersecurity & Privacy Gaps**: Weak systems expose personal data to breaches. Regulatory oversight is minimal, and protection standards fall short of global benchmarks.
- **Monitoring & Evaluation deficit**：There is a lack of effective systems to track progress and impact of digital education initiatives at scale.

Development Goals for 2030

According to the National Tourism Strategy 2025–2030 (Draught Version in June 2025), Kenya aims to become a globally competitive, sustainable, and inclusive destination, with a focus on ecotourism and digital innovation.

- By 2030, international tourists' arrivals are projected **to hit 5 million**, generating over 1.2 trillion Kshs (~USD 9B), supporting 2.5 million jobs, and contributing 12% to GDP.
- **Diversification of tourism products**: Expanding beyond traditional wildlife and beach tourism to include cultural, agro-tourism, sports, and conference tourism.
- **Sustainability and conservation**: Promoting eco-tourism and responsible travel practices to protect Kenya's natural heritage.

- **Digital transformation**: Enhancing digital platforms for marketing, bookings, and data-driven decision-making.
- **Community involvement**: Empowering local communities through inclusive tourism models and benefit-sharing mechanisms.

Innovative Technology Adoption and Planning Principles

Innovative Technologies Adoption:

- **Mobility Optimization**: Big data and IoT streamline traffic flow with smart parking, dynamic routing, and real-time navigation.
- **Smart Services**: 5G and cloud computing enable seamless access to bookings, e-tickets, smart guides, and personalized VIP services.
- **Smart Marketing**: AI and big data drive targeted promotions, while 5G live streaming and AR boost engagement and visibility.
- **Traffic & Visitor Management**: IoT, GIS, and digital avatars support real-time monitoring, navigation, and safety in scenic areas.
- **Digital Resource Management:** Cultural assets are digitized for virtual exhibitions, online tours, and heritage preservation.

Planning Principles:

- **Experience Enrichment:** The goal is to transform data and technology into meaningful, immersive, and seamless travel experiences.
- **Technology-Driven**: Leverage advanced technologies like IoT, AI, big data, and cloud computing to enhance decision-making, service delivery, and visitor experiences.
- **Data-Informed Strategy:** Real-time data collection and analysis help optimize resource allocation, predict tourist behavior, and personalize services.
- **Accessibility & Inclusivity**: Smart destinations prioritize universal access, multilingual support, and cultural sensitivity to serve diverse traveler needs.
- **Integrated Ecosystem Approach**: Collaboration among governments, businesses, and communities to create a connected network of smart services and infrastructure.

- **Resilience & Adaptability**: Smart tourism systems are designed to respond dynamically to changing conditions like seasonal demand or global disruption.

Smart Tourism ICT Infrastructure Architecture 2030

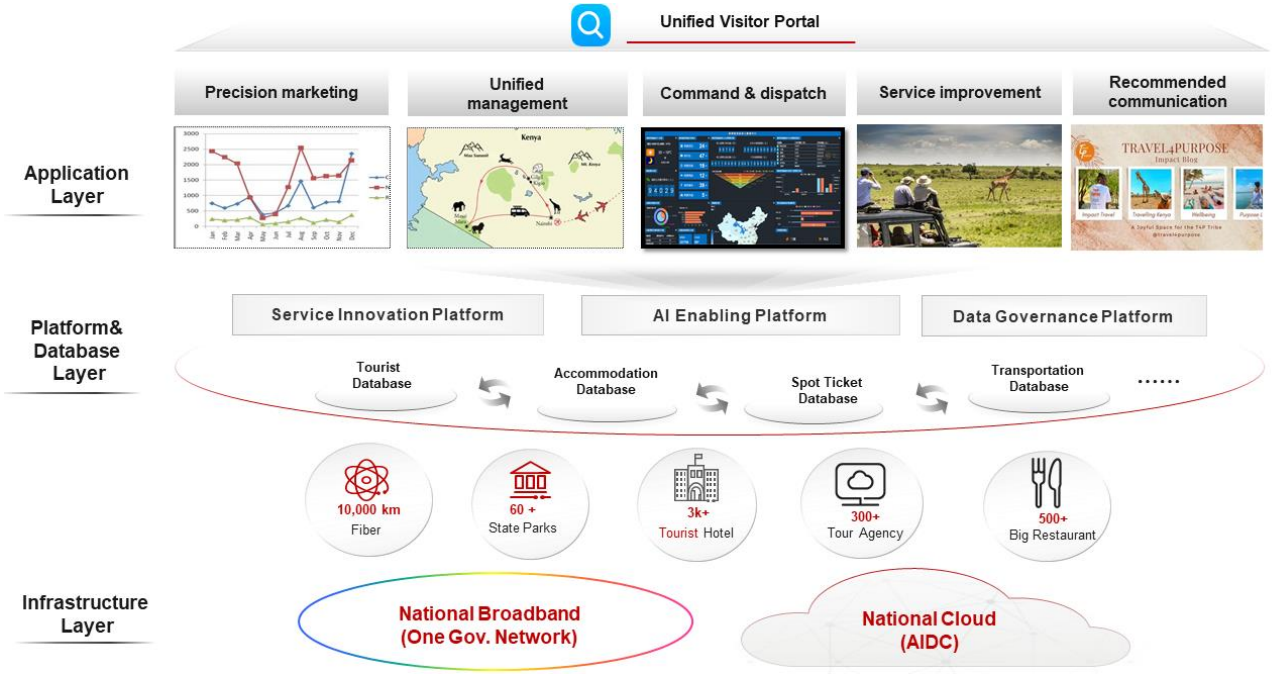

Figure 4.3.3.1.1. Smart Tourism ICT Infrastructure Architecture 2030

Evolution Roadmap of Smart Tourism

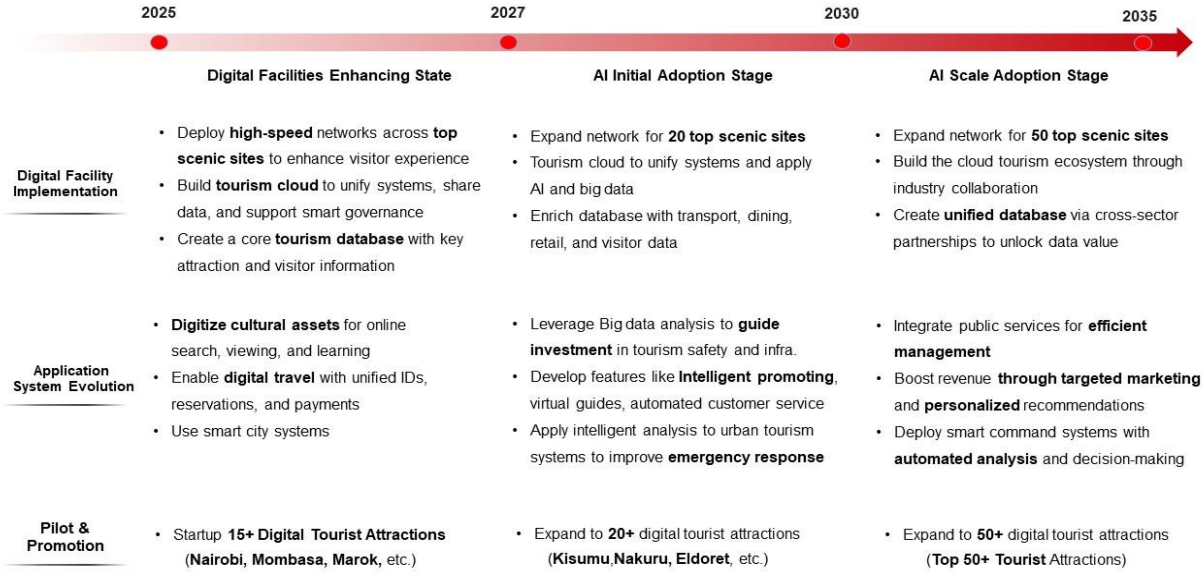

Figure 4.3.3.1.2. Evolution Roadmap of Smart Tourism ICT Infra. Architecture 2030

Value Proposition

The digitization and intelligent transformation of the tourism industry have brought multifaceted value to both the sector and the nation, including:

- **Boosts Foreign Exchange:** High-quality digital experiences attract international visitors, generating billions in revenue.
- **Enhances Visitor Experience**: Real-time data and personalized guidance improve planning and satisfaction.
- **Improves Operations:** Smart systems enable efficient, safe, and responsive scenic area management.
- **Modernizes Marketing:** Big data and digital tools drive targeted campaigns and brand visibility.
- **Supports Sustainability:** Intelligent resource management reduces energy use and environmental impact.
- **Expands Service Models**: Cloud tourism and virtual experiences diversify offerings and increase engagement.

AI-Enabled Smart Transportation:

Digital transformation is revolutionizing the transportation industry by streamlining operations, reducing costs, and enhancing customer satisfaction.

- **Operational Efficiency**: Automation and analytics optimize routes, reduce fuel use, and cut costs.
- **Customer Empowerment:** Real-time tracking and mobile tools enhance transparency and control.
- **Smarter Decisions**: AI supports faster, data-driven logistics planning.
- **Sustainability**: Digital systems enable greener practices and adoption of electric vehicles.
- **Competitive Edge**: Innovation boosts agility and responsiveness in a fast-changing market.

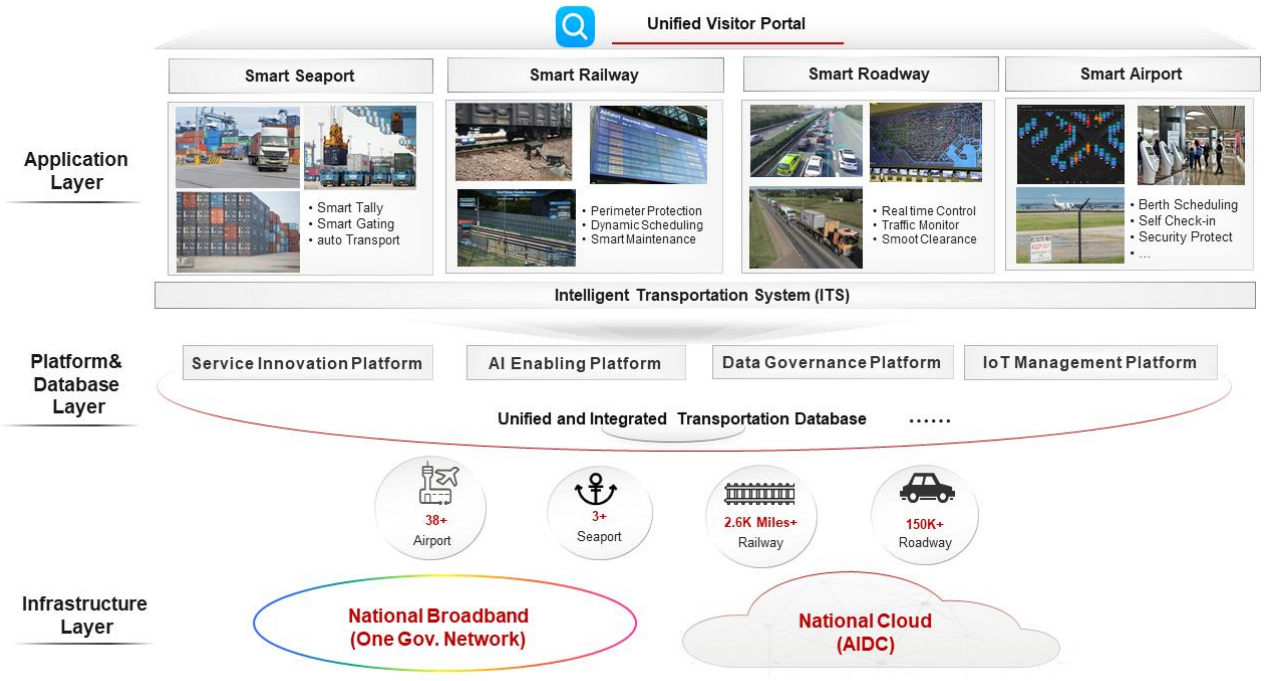

Figure 4.3.3.2. Smart Transportation System Architecture 2030

4.3.3.2. AI-Enabled Smart Seaport:

Global Trends

Global seaport digital transformation is accelerating, but unevenly driven by efficiency goals, climate mandates, and competitive pressures. Smart port adoption is rising, yet many ports remain in early stages.

- **Growing Adoption of Smart Technologies**：Ports are increasingly using AI, IoT, and automation to optimize cargo handling, vessel scheduling, and yard operations.
- **Emphasis on Data Integration**：There's a push for interoperable systems that allow seamless data exchange between ports, shipping lines, and logistics providers.
- **Sustainability-Driven Innovation**：Digital tools are helping ports reduce emissions, manage energy use, and support green corridor initiatives for cleaner trade routes.
- **Uneven Progress Across Regions**：Large, well-funded ports are advancing quickly, while smaller or developing ports face challenges in infrastructure and investment.
- **Performance and Efficiency Gains**: Digitized operations lead to faster turnaround times, reduced congestion, and better resource allocation.

- **Focus on Cybersecurity**: As ports become more connected, protecting digital infrastructure from cyber threats is a growing priority.

Kenya Market Insight

Current Situation:

- Until now Kenya is modernizing its maritime sector, with Mombasa Port leading digital transformation, and its Key efforts include upgrading terminal systems, adopting Port Community Systems for streamlined logistics, enhancing infrastructure at Mombasa and Lamu ports.
- Kenya's ports are now more aligned with international practices, including blockchain cargo tracking and electronic bills of lading.

Development Challenge:

- Insufficient operational efficiency: Average cargo detention time still reaches 4.5 days (target is 2.2 days).
- Legacy systems and fragmented platforms: Kenya Ports Authority (KPA) is transitioning to a new Terminal Operating System (TOS), but existing systems are siloed and lack interoperability, slowing down automation and data sharing.
- Limited integration across agencies: Customs, shipping lines, and logistics players operate on disparate platforms, creating bottlenecks in cargo clearance and real-time tracking.
- Inadequate digital infrastructure: Despite Mombasa Port's regional importance, its ICT backbone struggles with bandwidth limitations, outdated hardware, and inconsistent connectivity—especially in hinterland corridors.
- Weak data governance: There's limited clarity on data ownership, access rights, and cross-border data flows—especially critical for regional trade under AfCFTA.

Development Goals for 2030

According to Kenya's Vision 2030, as a pillar industry, the implementation of digital and intelligent seaports is critical. It encompasses key development objectives outlined below.

- **World-Class Ports of Choice**: Kenya Ports Authority aims to position Mombasa and Lamu as premier East African hubs, aligned with Kenya Vision 2030—driving industrialization, sustainability, and regional integration.
- **Smart Technology Integration**：Upgrade terminal systems for end-to-end digital workflows. AI & IoT Deployment, and enhance cargo handling, surveillance, and predictive maintenance, and develop intelligent transport systems to enable smarter logistics & mobility.
- **Operational Excellence**：Reduce container ship turnaround from 2.8 to 2.2 days by 2028, and increase berth productivity to 48 moves/hour, and achieve zero accidents through safety innovation and training
- **Green Port Initiatives**：Implement Green Port Policy (2024–2028): renewable energy, EVs, marine biodiversity, and introduce cold ironing to cut docked ship emissions and transit to electric forklifts and hybrid cranes
- **Economic Growth & Connectivity**：Expand cargo throughput to 65 million tons by 2028.Strengthen links to inland depots and regional markets, including Ethiopia and DRC.

Innovative Technology Adoption and Planning Principles

Innovative Technologies Adoption:

The digital transformation of ports plays a vital role in upgrading the global supply chain, and new technologies us introduced as below:

- **Digital Foundation**: Deployment of smart sensor networks and centralized data platforms for real-time visibility and analysis
- **Automated Operations**: Implementation of remote-control systems, intelligent cargo handling, smart gates, and AI-driven scheduling
- **Operational visualization**: Involves using digital tools like: dashboards, 3D models, and real-time data displays to visually represent the status, performance, and workflows of complex systems or operations
- **Service Model Restructuring**: Creation of integrated port and shipping ecosystems using electronic bills of lading and automated customs clearance

- **Sustainable and Resilient Systems**: Digital powering zero-carbon operations and enhancing safety and operational resilience.

Planning Principles:

- **Integrated Planning & Phased Execution**: Ensure unified data standards and platform architecture. Begin with digital twin and industrial IoT infrastructure, then scale application scenarios progressively.
- **Efficiency vs. Value Optimization**: Use automation to maximize throughput during peak times; apply data analytics during off-peak periods to reduce energy and storage costs, enabling agile resource deployment.
- **Collaborative Ecosystem Development**: Transition from isolated tech applications to a centralized supply chain hub. Facilitate data sharing across customs, carriers, and logistics providers to strengthen interoperability.

Smart Seaport ICT Infrastructure Target Architecture 2030

By 2030, the smart seaport ecosystem will harness integrated digital technologies including IoT, AI, and blockchain to optimize cargo operations, enable real-time visibility, streamline end-to-end logistics, and ensure secure, sustainable, and globally competitive maritime infrastructure**.**

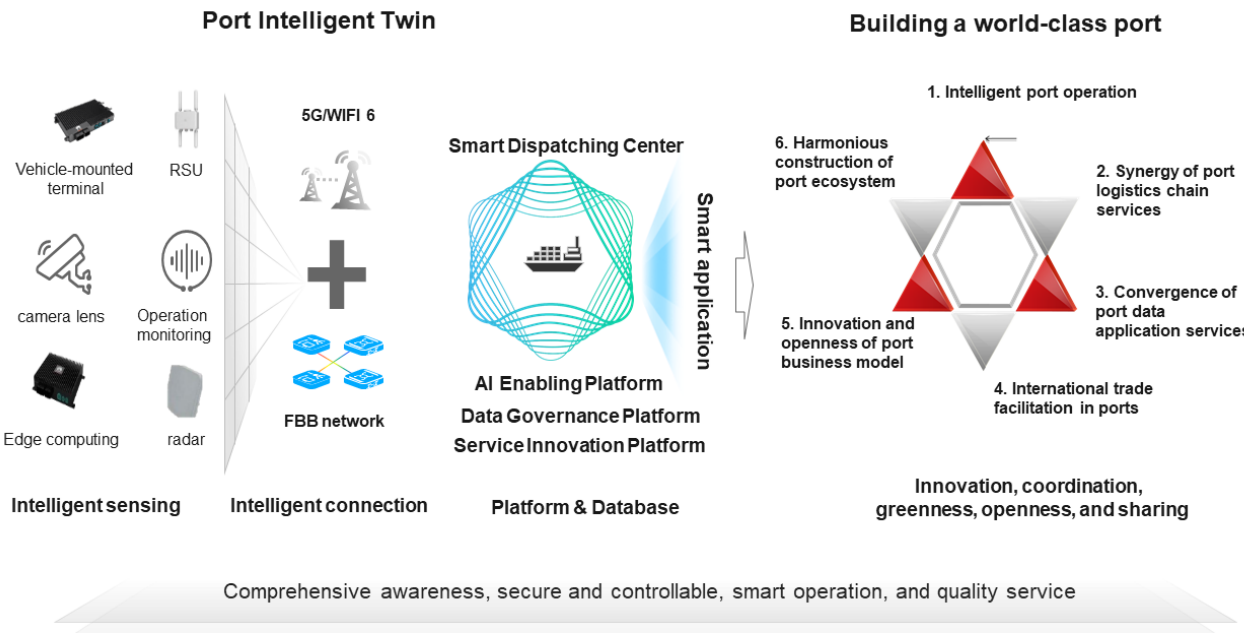

Figure 4.3.3.2.1. Smart Seaport ICT Infrastructure Target Architecture 2030

Evolution Roadmap

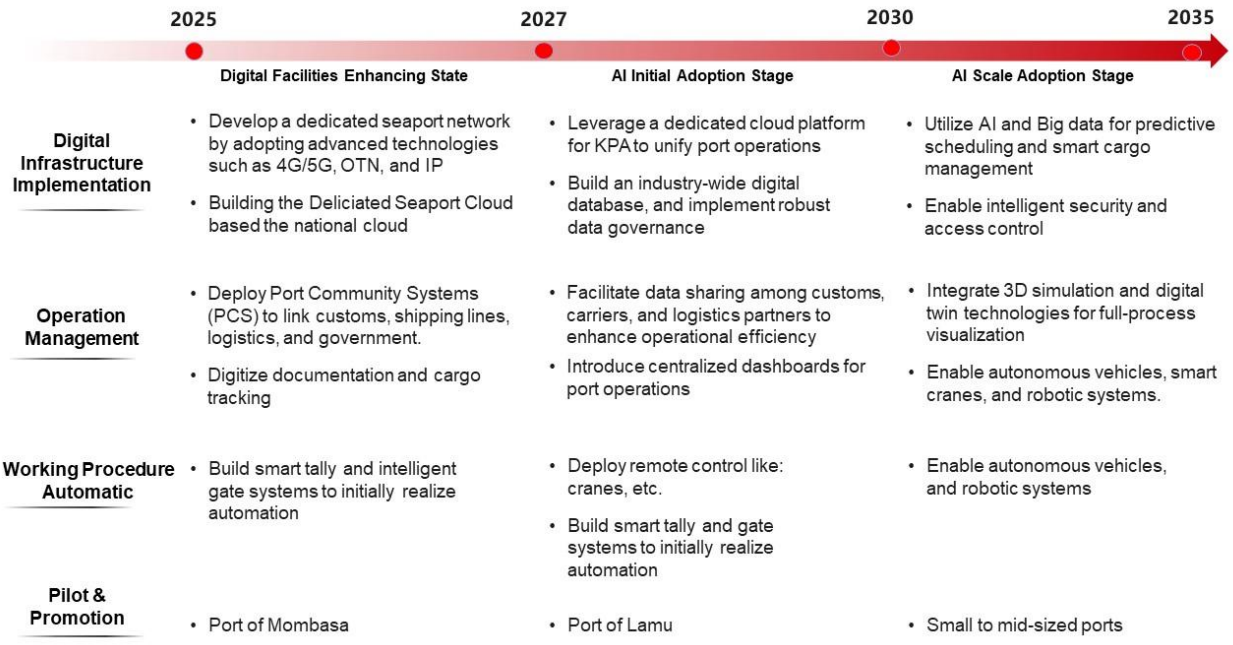

Figure 4.3.3.2.2. Evolution Roadmap of Smart Seaport ICT Infra. Architecture 2030

Value Proposition

Enhanced Passenger Experience: Through ONE ID (faster passage, reduced waiting time), gate allocation (reducing the use of shuttle buses), 5G service robots, online service robots (NLP models), and terminal crowd density analysis for dynamic allocation of service resources, the travel experience for passengers is significantly improved.

Improved Operational Efficiency: By applying cloud and big data, video analysis, AI prediction, and Digital Twin technology, airport management becomes more streamlined, coordination between airport clusters is more efficient, and the overall operational efficiency of the airport is enhanced.

Sustainable Development: Meeting ACI certification standards, airports become more environmentally friendly and green.

More Secure: Safety is the most fundamental and crucial requirement for airports. By incorporating light sensing, video analysis, and AI algorithms, the operations of the airport's flight areas and terminals are made safer.

4.3.3.3 AI-Enabled Smart Railway:

Global Trends

- **AI & Automation Rail systems** are using AI for smarter scheduling, crowd control, and predictive maintenance. Automation is improving safety and reducing delays.
- **IoT & 5G Connectivity Sensors** and real-time data help monitor trains, tracks, and stations—boosting reliability and enabling faster responses to issues.
- **Autonomous & High-Speed Trains** Countries like China and Germany are testing driverless and ultra-fast trains, aiming for safer and more efficient travel.
- **Digital Ecosystems Rail networks** are becoming more integrated, with digital twins and centralized platforms connecting infrastructure, vehicles, and passengers.
- **Sustainability Focus Digital tools** support greener operations, helping railways cut emissions and align with climate goals.
- **Cybersecurity Priorities** As rail systems go digital, protecting them from cyber threats is critical—especially in Europe and Asia.

Kenya Market Insight

Current Situation:

Kenya Railways has made solid progress in its digital transformation journey. Here are some of the key milestones and initiatives:

- **Freight Integration**: Kenya Railways is linking its cargo system with KRA and KPA to speed up operations and improve efficiency.
- **Smart Ticketing & Payments**: A new digital ticketing system for SGR is in progress, backed by Ksh300 million. More payment options are being added to cut fraud and boost revenue.
- **ICT Upgrade:** A full tech audit is underway to guide future improvements, including digital fare collection and a commuter master plan.

Development Challenge:

- **Freight Shortfall**: Target was 22M tons, but only 7M achieved. Uganda and South Sudan still depend heavily on road transport, while Tanzania's upgraded Central Line has drawn away demand.
- **Financial Strain**: Despite rising revenue, the railway remains loss-making.
- Operational Challenges: Digital rollout is slow—just 30% of dispatch is digitized, and freight tracking is still manual.
- **Aging Infrastructure**: Metre-gauge lines are poorly maintained, with accident rates three times higher than SGR. Yet 80% of the budget goes to SGR.

Development Goals for 2030

As one part of Vision 2030, **Kenya Railways' Strategic Plan 2022–2027** lays out a bold roadmap to transform the country's rail transport sector, and which vision: To be a provider of world-class rail services and upgrade and develop an integrated rail network that is safe, reliable, and sustainable.

Infrastructure Modernization and Smart Systems:

- **Upgrade of signaling and communication systems**: Kenya Railways aims to deploy advanced signaling, centralized traffic control, and real-time monitoring to improve safety and efficiency.
- **Digital ticketing and passenger services**: Expansion of e-ticketing platforms, mobile apps, and automated customer service to streamline travel and enhance user experience.
- **Smart freight logistics**: Integration of GPS tracking, RFID, and IoT sensors to optimize cargo movement, reduce turnaround time, and improve transparency across the supply chain.

Regional Integration and Economic Impact:

- **Standard Gauge Railway (SGR) expansion**: Continued development of SGR corridors linking Mombasa to Naivasha, Kisumu, and eventually to Uganda, Rwanda, and South Sudan to boost intra-African trade.

- **Digital interoperability with ports and roads**: Seamless data exchange between railway, port, and road systems to support multimodal logistics and reduce congestion.
- **Support for Vision 2030**: Rail transport is positioned as a key enabler of Kenya's industrialization and regional competitiveness, contributing to GDP growth and job creation.

Innovative Technology Adoption and Planning Principles

Innovative Technologies Adoption

- **AI & Machine Learning**: Predictive maintenance, automated inspections, and optimized scheduling.
- **IoT Sensors:** Real-time monitoring of trains, tracks, and environmental conditions.
- **Big Data Analytics**: Passenger flow analysis, freight optimization, and data-driven planning.
- **Digital Twins**: Virtual models for simulation, forecasting, and proactive maintenance.
- **Cloud Computing:** Centralized data access, scalable operations, and mobile services.
- **Autonomous Systems**: Driverless trains and automated control for safer, efficient travel.
- **Green Tech**: Hydrogen trains, regenerative braking, and electrification for sustainability.

Planning Principles:

- **User-Centric Design**: Prioritize passenger and freight user needs—make systems intuitive, accessible, and responsive.
- **Interoperability**: Ensure digital platforms can integrate with customs, ports, and regional transport systems for seamless operations.
- **Scalability & Flexibility:** Build systems that can grow with demand and adapt to new technologies or policy shifts.
- **Data-Driven Decision Making:** Use real-time data for scheduling, maintenance, and performance optimization.
- **Cybersecurity & Privacy:** Protect infrastructure and user data with robust security protocols.

- **Sustainability Alignment:** Support eco-friendly operations through smart energy use and emissions tracking.

Smart Railway's ICT Infrastructure Architecture 2030

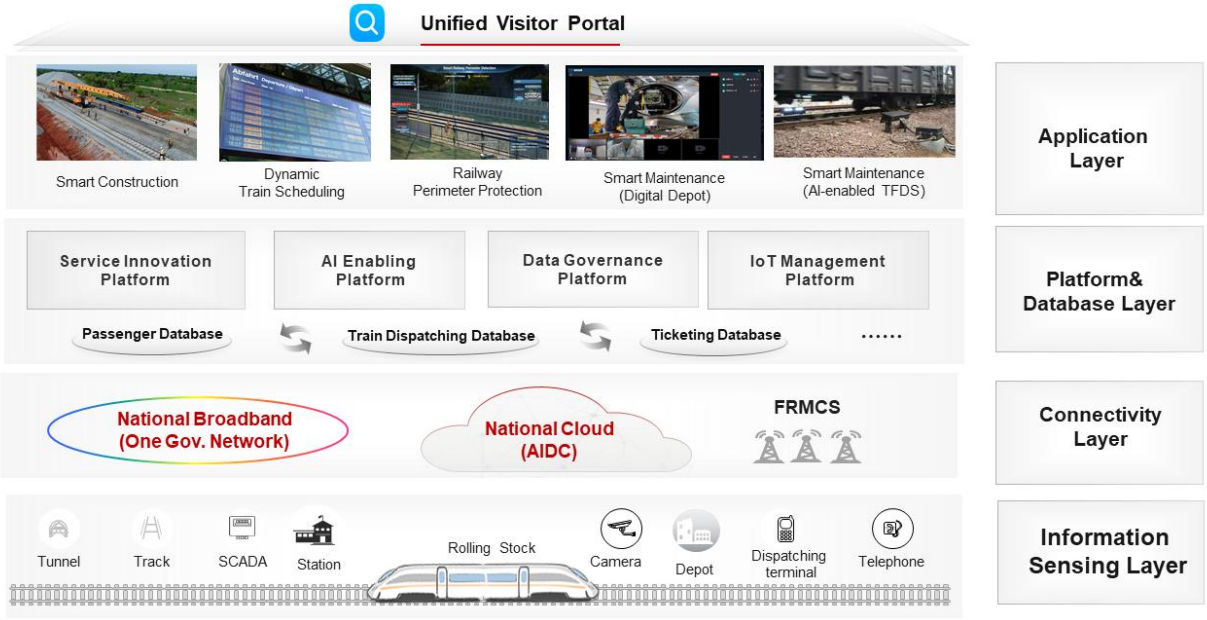

Figure 4.3.3.3.1. Smart Seaport ICT Infrastructure Architecture 2030

Evolution Roadmap

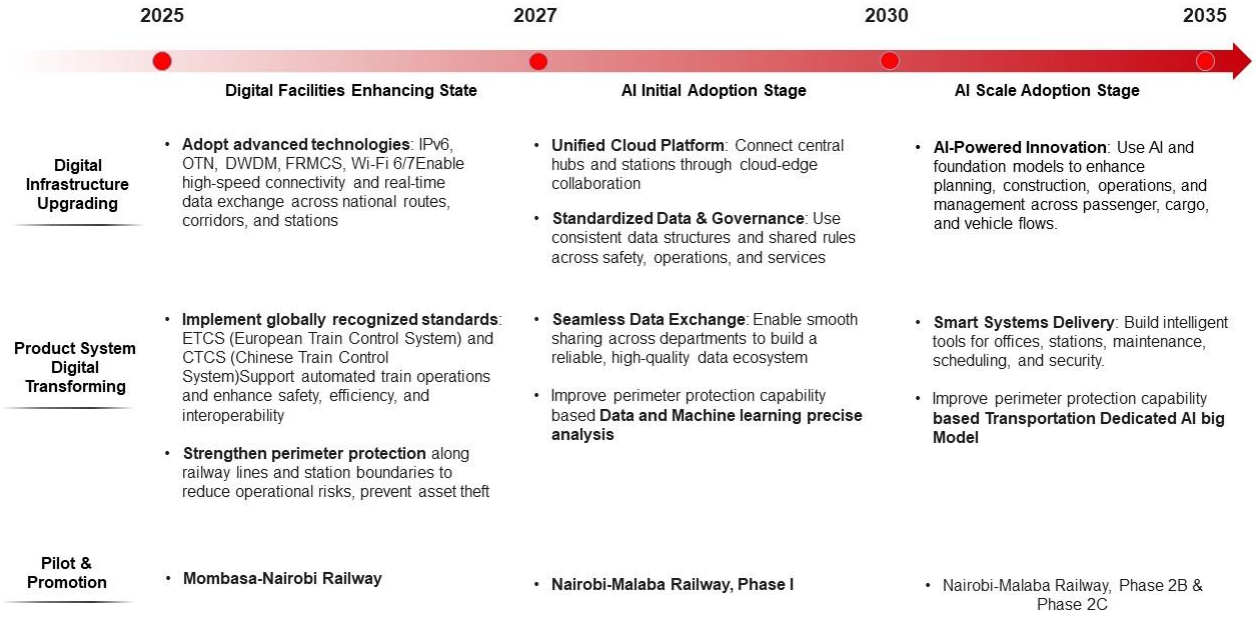

Figure 4.3.3.3.2. Evolution Roadmap of Smart Railway ICT Infra. Architecture 2030

Value Proposition

Optimizing Passenger and Freight Service Levels

- Intelligent coverage throughout the journey ensures seamless and convenient travel, enhancing passenger satisfaction
- Smart freight marketing and full visibility of cargo throughout the journey improve the satisfaction of cargo owners
- Ensuring Safe and Efficient Railway Production
- Advanced communication and signaling systems guarantee the safe and efficient operation of trains.
- Intelligent maintenance optimizes repair schedules and procedures, improving operational precision.
- Safety and intelligent early warning systems reduce the need for manual inspections and lower safety risks.

Enhancing Management and Decision-Making Capabilities

- Data interoperability and sharing, combined with artificial intelligence and large models, build a smart brain for railways, achieving visible status, identifiable risks, decision-making support, manageable events, possible command, and predictable future.

4.3.3.4 AI-Enabled Smart Roadway

Global Trends

- **AI-Enhanced Traffic & Fleet Management**：Cities and logistics firms are using AI to optimize traffic flow, predict demand, and improve fleet efficiency—reducing congestion and fuel use
- **Digital Twin Adoption**: Virtual models of road networks help simulate traffic scenarios, guide infrastructure planning, and support predictive maintenance.
- **Smart Curbside Adoption**: Real-time curb management systems enable dynamic pricing, efficient delivery zones, and better coordination for ride-hailing and parking.
- **Cloud-Edge Integration**: Governments are deploying cloud-edge architectures to enable fast data exchange between central control centres and roadside infrastructure.

- **Cybersecurity & Resilience**: With growing digital reliance, transport systems are investing in robust cybersecurity and climate-resilient infrastructure to ensure continuity.
- **Sustainable Mobility Platforms**: Digital tools are helping cities monitor emissions, optimize EV charging networks, and support low-carbon transport policies.

Kenya Market Insight

There is achievement obtained until 2025 in roadway transportation digital transformation with the working of the Kenya government, detail is blow:

Current Situation:

- **TIMS Platform:** The NTSA's Transport Integrated Management System has digitized vehicle registration, licensing, and inspection—cutting processing times dramatically.
- **E-Hailing Expansion**: Ride-hailing apps for cars, motorcycles, and tuk-tuks have improved urban mobility and created new livelihoods.
- **Digital Freight Tracking:** Logistics platforms now offer real-time cargo visibility, reducing delays and boosting efficiency.
- **Smart Navigation Tools**: Commuters benefit from route optimization and digital trip planning via mobile apps.
- **E-Mobility & Urban Transport Policies**: National frameworks now support electric vehicles and smart urban mobility systems

Development Challenge:

- **Fragmented Systems**: Infrastructure and data platforms often operate in silos, limiting coordination and real-time insights.
- **Limited Lifecycle Coverage**: Digital tools are rarely applied across planning, construction, operations, and maintenance as a unified system.
- **Reactive Maintenance**: Many regions still rely on manual inspections and delayed repairs, increasing safety risks.
- **Accessibility Challenges**: Digital services often exclude rural communities and vulnerable groups due to poor design and outreach.

- **Cybersecurity & Resilience Risks:** Rising connectivity brings increased exposure to cyber threats and climate disruptions, with limited safeguards in place.

Development Goals for 2030

As the main part of the Kenya digital Vision 2030, the Strategic Plan 2023-2027 lunched by the ministry of the roads and transport has been given some specific goals:

Smart Infrastructure and Intelligent Transport Systems (ITS)

- **Deployment of ITS technologies**: Kenya aims to implement smart traffic lights, real-time traffic monitoring, and automated incident detection systems to reduce congestion and improve road safety.
- **Digital tolling and e-payment systems**: Expansion of cashless toll collection and smart road pricing to streamline revenue generation and reduce delays.
- **Sensor-enabled roads and bridges**: Integration of IoT sensors for structural health monitoring, predictive maintenance, and environmental data collection.

Policy, Standards, and Institutional Reform

- **Kenya Roads Bill and 20-Year Master Plan:** Establishing legal and strategic frameworks to guide digital transformation and infrastructure investment.
- **Toll Funding Policy and RSIP II**: Mobilizing private capital and aligning digital upgrades with national development priorities.

Innovative Technology Adoption and Planning Principles

Innovative Technologies Adoption:

- **Intelligent Transport Systems (ITS):** Real-time traffic monitoring, adaptive signal control, and automated incident response systems improve safety and flow.
- **Internet of Things (IoT):** Sensors embedded in roads, vehicles, and infrastructure collect data on traffic, weather, and road conditions for smarter decision-making.
- **5G Connectivity**: Enables ultra-fast communication between vehicles, infrastructure, and control centres critical for autonomous driving and real-time analytics.

- **Artificial Intelligence (AI):** Powers predictive maintenance, traffic optimization, and automated scheduling across transport networks.
- **Digital Twins**: Virtual models of road systems simulate scenarios for planning, maintenance, and emergency response.
- **Smart Road:** Features Includes wireless traffic signs, smart intersections, on-road vehicle weighing, and energy-harvesting surfaces.
- **Cloud Computing & Edge Processing:** Supports scalable data storage and real-time processing at the roadside for faster, localized decision-making.

Planning Principles:

- **Interoperability**：Systems must communicate seamlessly across platforms, regions, and technologies—ensuring smooth data exchange between vehicles, infrastructure, and control centres.
- **Data-Driven Decision Making**: Analytics and AI use collected data to optimize traffic flow, predict maintenance needs, and inform infrastructure planning
- **User-Centric Design**: Solutions prioritize safety, accessibility, and convenience for all users—including pedestrians, cyclists, drivers, and vulnerable groups
- **Sustainability**: Digital systems support low-emission transport, efficient energy use, and climate-resilient infrastructure
- **Security & Privacy**: Robust cybersecurity protects systems from threats, while data governance ensures user privacy and ethical use of information
- **Scalability & Flexibility:** Infrastructure and platforms are designed to evolve with technology and adapt to future mobility trends.

Smart Roadway ICT Infrastructure Architecture 2030

The smart roadway system relies on real-time data, IoT sensors, and intelligent traffic management to improve safety, reduce congestion, and support seamless mobility. It integrates digital tolling, predictive maintenance, and connected vehicle infrastructure for efficient, future-ready transport.

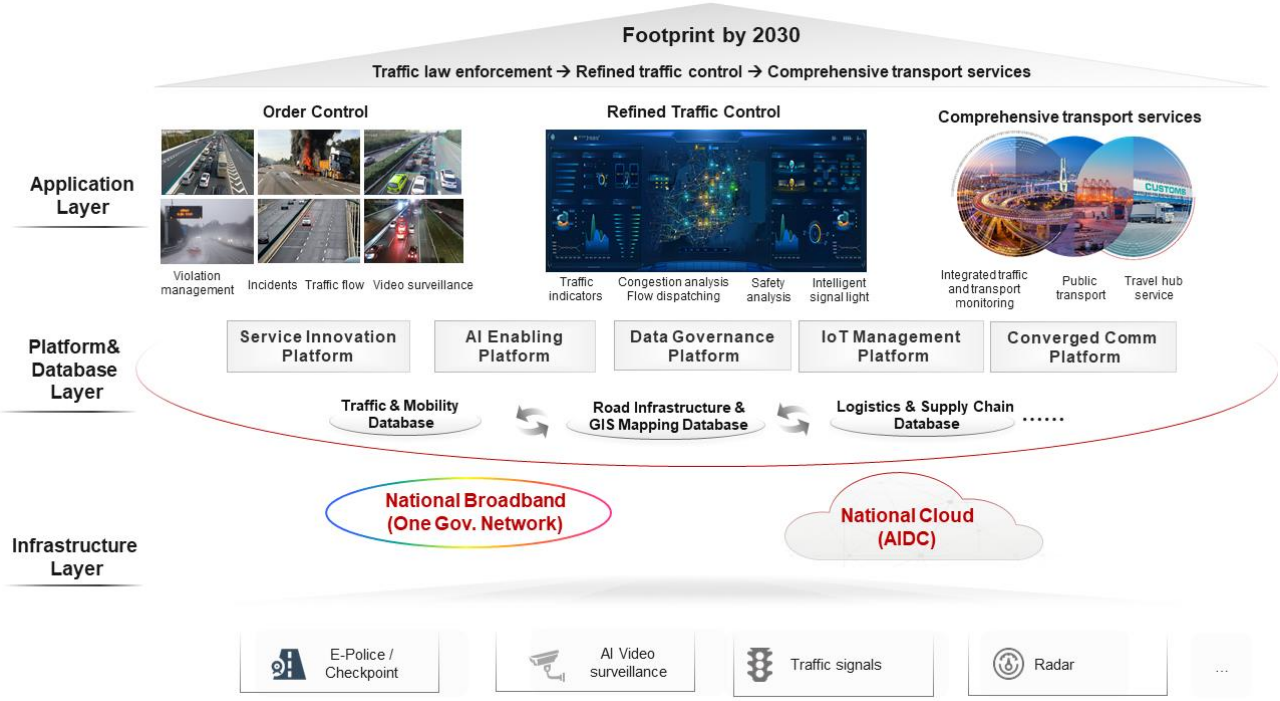

Figure 4.3.3.4.1. Smart Roadway ICT Infrastructure Architecture 2030

Evolution Roadmap

	2025	2027	2030	2035
	Digital Facilities Enhancing State	AI Initial Adoption Stage	AI Scale Adoption Stage	
Digital Infrastructure Implementation	Strengthen digital networks to ensure seamless connectivity and **real-time data exchange** across transport agencies	Establish unified cloud platform for roadways to enable advanced traffic analysis and **smart decision-making** across transport agencies	**Deploy Dedicated AI models** to optimize road planning, construction, operations, management to drive smoother traffic, passenger flow	
Road Awareness Covering blind spot	• ePolice coverage: ~40% • Checkpoint coverage: ~40% • Mobile data test coverage: ~30%	• ePolice coverage: ~ 60% • Checkpoint coverage: ~ 60% • Mobile data detection coverage: ~50%	• ePolice coverage: 80%+ • Checkpoint coverage: 80%+ • Mobile data test coverage: 80%+	
Comprehensive Transportation Governance	• Violation, checkpoint, and traffic incident system • Signal control & guidance & traffic mobile data system	• Unified networked joint control • Unified Transportation dataset • Traffic command system	• Integrated transportation platform	
Highway Toll	• ETC+MTC pilot	• ETC+MTC coverage: ~60% • Free flow charging pilot	• Free flow charging coverage: ~80%	
Pilot & Promotion	• Nairobi & Mombasa	• Nakuru, Kisumu, Eldoret	• Expending to other cities	

Figure 4.3.3.4.2. Evolution Roadmap of Smart Roadway ICT Infra. Architecture 2030

Value Proposition

The value of smart transportation to customers is primarily reflected in the following three aspects:

For the Nation/Government:

- Enhancing the reputation and image of the country and cities, reducing traffic violations and accidents
- Decreasing traffic congestion and improving the capacity of the road network
- Enabling traffic scheduling and passage assurance for key/emergency events

For Residents/Visitors:

- Improving the travel experience on urban road networks and highways
- Unlocking the potential of road traffic
- Reducing commuting time and enhancing the travel experience
- Providing more options for residents' travel through multimodal transport

For Traffic Management Authorities:

- Achieving modernization in transportation management
- Establishing a national traffic management platform, gradually achieving full coverage of major roads
- Processes involving precise perception, analysis, processing, and operational evaluation of traffic data
- Developing traffic data dictionaries, data formats, and unified national standards

4.3.3.5 AI-Enabled Smart Airport

Global Trends

Digital airspace management, powered by connectivity and intelligent coordination, is replacing static segmentation to boost efficiency and safety.

Airport traffic systems are evolving towards intelligence, optimizing traffic flow through intelligent transportation management systems, reducing congestion, and improving travel efficiency.

Biometric technologies like facial and fingerprint recognition are increasingly used in airports to streamline security checks and enhance passenger experience

Digital technologies are also promoting the green development of airport traffic systems, reducing energy consumption and carbon emissions through intelligent management.

Kenya Market Insight

Current Situation:

- **Kenya Airports Authority (KAA):** It is actively investing in smart, sustainable airport infrastructure to enhance operational efficiency and passenger experience, and the Major airports—including JKIA, Wilson, Moi, Eldoret, and Isiolo are undergoing upgrades such as: new passenger terminals, runway extensions, airfield lighting systems, aviation rescue and firefighting centres, and solar farms for energy sustainability
- **The Transport Integrated Management System (TIMS)** has revolutionized service delivery: Reduced vehicle logbook and number plate processing from six months to just three days; Enabled instant online applications for licences and permits. Eliminated intermediaries and fraud-prone manual processes

Development Challenge:

- **Lag in Passenger Recovery**: The share of international transit has decreased from 65% (2019) to 50% (2023), with traffic 45b4diverted to Addis Ababa (ADD), Kigali (KGL).
- **Insufficient Cargo Competitiveness**: Lagging cold chain technology and route network have led to high-value-added goods (such as pharmaceuticals) being redirected to ADD.
- **Poor Financial Sustainability**: Non-aeronautical revenue accounts for only 25% (target 40%), relying heavily on government subsidies and loans.
- **Infrastructure Bottlenecks:** NBO Airport is operating beyond capacity (design capacity of 6.5 million vs. 9 million in 2023), with the expansion project delayed by 2 years.

Development Goals for 2030

KAA (Kenya Aviation Authority) is focusing on route development and airline partnerships to position Nairobi as a key gateway to Africa and a vital link in global aviation:

- By 2030, the target passenger volume is 25 million per year, and the target cargo volume is 600,000 tons per year
- **Artificial Intelligence Integration**: Kenya Airways (KQ) would plan to embed AI across its operations—from predictive maintenance on aircraft to AI-powered customer service chatbots. These tools reduce downtime, cut costs, and improve responsiveness.
- **Biometric Security Enhancements**: JKIA has introduced facial recognition, fingerprint scanning, and AI surveillance to streamline passenger flow and enhance security. These upgrades significantly reduce wait times and improve trust in airport systems.
- **Smart Infrastructure**: Dynamic check-in kiosks, autonomous baggage handling, and real-time crowd management systems are now part of Kenya's airport ecosystem. Algorithms analyse passenger behavior to optimize gate assignments and reduce bottlenecks.
- **IoT and Connectivity**: In partnership with Safaricom, Kenya Airways is testing IoT-powered baggage tracking and onboard connectivity, laying the foundation for a fully digitized travel experience.

New Technologies Adoption and Planning Principles

Technical Adoption:

- **Mobile & Digital Platforms**: Enhances passenger engagement and convenience e.g. Airport apps for real-time flight updates, digital boarding passes, indoor navigation.
- **Internet of Things (IoT):** Connects devices & systems for real-time data exchange e.g. Smart baggage tracking, environmental sensors, predictive maintenance for equipment.
- **Big Data Analytics:** Enables data-driven insights for operational efficiency, e.g. Analyzing passenger behavior, forecasting demand, improving resource allocation.
- **Biometrics**: Streamlines identity verification and security and examples: Facial recognition at check-in, boarding, and immigration; fingerprint scanning.

- **Digital Twin**: Creates a virtual replica of the airport for simulation and monitoring e.g. Predictive maintenance, emergency response planning infrastructure optimization.

Planning Principles:

- **Data-Driven Decision Making**: Use real-time analytics to optimize operations and passenger flow, and employ predictive maintenance for infrastructure and equipment, and integrate digital twins for simulation and planning.
- **Integrated Technology Ecosystem**: Leverage IoT, AI, and machine learning for automation and efficiency, and implement biometric systems for security and passenger processing, and centralize control systems for energy, traffic, and logistics.
- **Passenger-Centric Experience**: Streamline check-in, security, and boarding with smart kiosks, and provide real-time updates and wayfinding via mobile apps, and enhance comfort with smart lounges and personalized services.
- **Security and Resilience**: Use biometric and AI-powered surveillance systems, and design flexible infrastructure to adapt to future threats or pandemics, and ensure cybersecurity across all digital platforms.
- **Scalable and Flexible Infrastructure**: Plan for modular expansion based on traffic forecasts, and leverage use simulation tools to test future scenarios, and design terminals and facilities with adaptability in mind.

Smart Airport ICT Infrastructure Architecture 2030

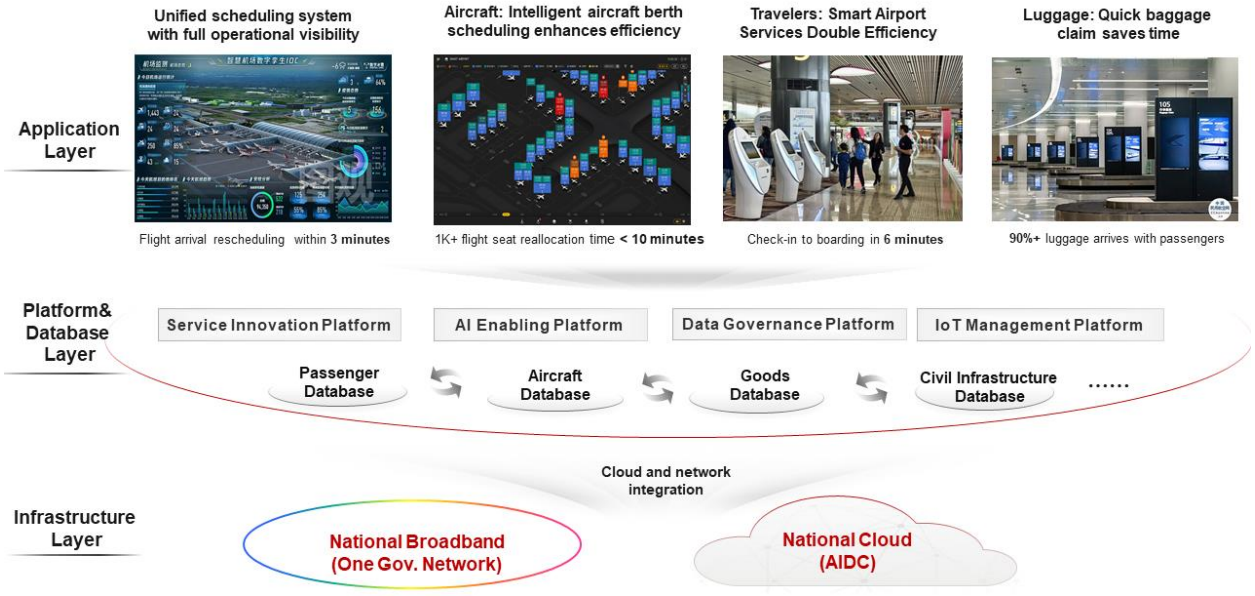

Figure 4.3.3.5.1. Smart Airport ICT Infrastructure Target Architecture 2030

Evolution Roadmap

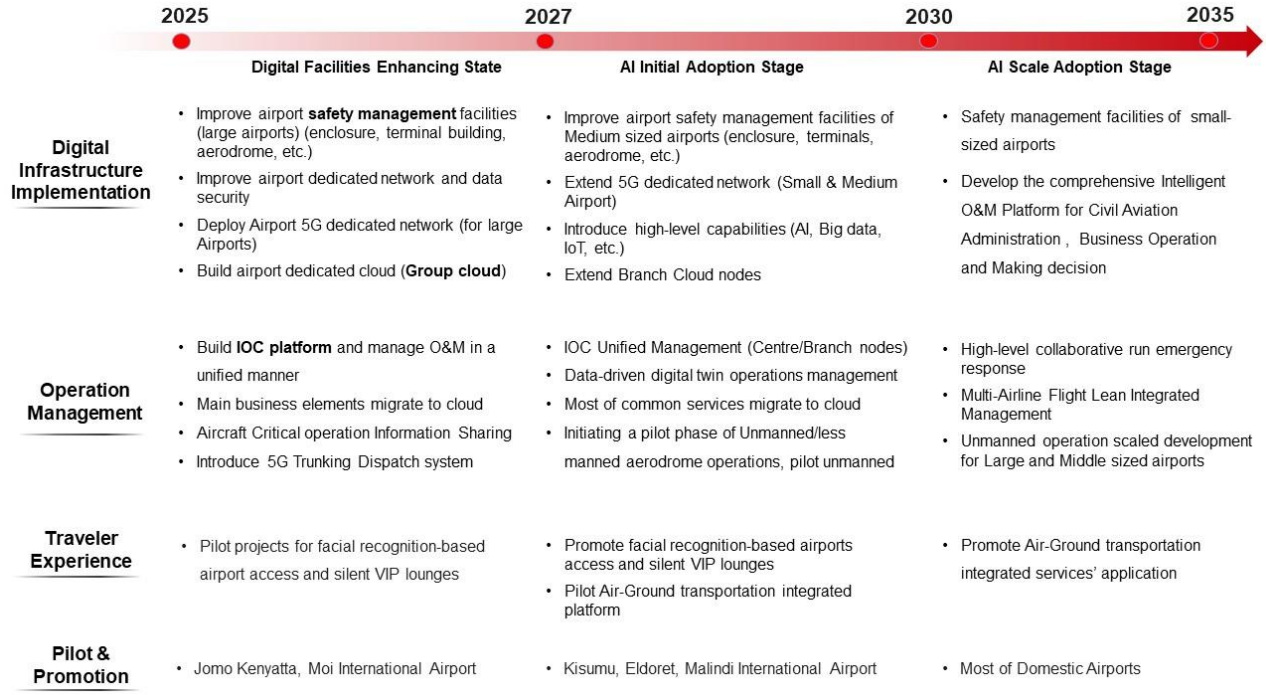

Figure 4.3.3.5.2. Evolution Roadmap of Smart Seaport ICT Infra. Architecture 2030

Value Proposition

- **Safety and Secure**: Safety is the most fundamental and crucial requirement for airports. By incorporating light sensing, video analysis, and AI algorithms, the operations of the airport's flight areas and terminals are made safer.
- **Enhanced Passenger Experience**: Through ONE ID (faster passage, reduced waiting time), gate allocation (reducing the use of shuttle buses), 5G service robots, online service robots (NLP models), and terminal crowd density analysis for dynamic allocation of service resources, the travel experience for passengers is significantly improved.
- **Improved Operational Efficiency**: By applying cloud, big data, video analysis, AI prediction, and Digital Twin technology, airport management is streamlined, coordination between airport clusters is more efficient, and operational efficiency of airport enhanced.
- **Sustainable Development**: Meeting ACI certification standards, airports become more environmentally friendly and green.

4.4. Establishing a Robust and Sustainable Ecosystem

Kenya's AI ecosystem will be built on main three pillars: innovation, talent, and cooperation. Innovation drives real-world applications through startups and pilot projects in healthcare, agriculture, finance, and education. Talent incubation sustains growth by reforming curricula, expanding skills programs, and nurturing versatile professionals. National cooperation provides the foundation with supportive policies, infrastructure, and global partnerships together positioning Kenya as Africa's AI hub and strengthening its influence in the global digital economy.

Together, these three elements interact to form a dynamic strategic pathway: innovation capacity expands application scenarios, talent incubation guarantees the continuity of technology and industry, and national cooperation institutionalizes and amplifies these achievements at the international level. This synergy not only shapes Kenya's role as a leading AI hub in Africa, but also lays the foundation for the country to gain greater influence and competitiveness in the global digital economy.

4.4.1 Accelerating AI R&D and Innovation Capability

Accelerating the process of scientific discovery with AI enabling: Advance exploration of AI-driven research paradigms and accelerate the development and application of large scientific models. Promote the intelligent upgrading of fundamental research platforms and major scientific infrastructure. Build open and shared high-quality scientific datasets to enhance the processing and utilization of scientific data.

Innovating R&D Models based on AI disruptive tech: Promote AI-driven integration of research, engineering, and product deployment to speed breakthroughs and efficient transformation. Expand intelligent R&D tools, and foster collaboration between AI and fields like biotech, IoT, cloud, and 5G, aligning new scientific results with application needs. The detailed planning is outlined below.

Global Trends

As the primary testbed for accelerating AI R&D and innovation capabilities, the AI-powered Lab serves as a catalyst for cross-sector breakthroughs, talent development, and rapid prototyping. The focus is shifting from experimentation to scalable impact.

- **AI-Powered Innovation**: Labs use AI and foundation models to speed up design, testing, and problem-solving.
- **Agile Teams**: Cross-functional teams work fast to turn ideas into prototypes.
- **Global Collaboration:** Labs partner with universities, startups, and companies worldwide.
- **Talent Development**: Labs double as training hubs for digital skills and emerging tech.
- **Scalable Impact**: Focus is shifting from experiments to real-world solutions.
- **Ethical & Sustainable Tech**: Labs prioritize responsible AI technologies and scenario solution innovation.

Kenya Market Insight

Current Development Trends

- **Nairobi as a Tech Hub**: Over 50 innovation labs and hubs like Qubit, Nailab, and Gearbox drive fintech, agritech, and healthtech solutions. Launched in September 2025, Qubit Hub is a government-backed initiative aimed at advancing AI research and innovation.

- **Global Partnerships**: Global Giant tech companies have invested in local labs and research centres.
- **Youth Engagement**: Labs offer training and incubation for Kenya's young, tech-savvy population.
- **Konza Technopolis**: The government's smart city project is building a national R&D& innovation park.

Development Challenge:

- **Infrastructure & Talent Gaps**: Labs face shortages in advanced equipment and skilled researchers.
- **Slow Education Reform**: Infrastructure and teachers' skill lag behind digital needs.
- **Funding Dependence:** Many labs rely on foreign donors and lack sustainable local investment.
- **Regional Imbalance:** Most labs are concentrated in Nairobi, with limited reach in other counties.

Development Goals for 2030

Kenya's AI Strategy 2025–2030 aims to position the country as Africa's leading hub for ethical, inclusive, and sustainable AI innovation driving socioeconomic transformation and global competitiveness.

1. Continental Leadership in AI

- Establish Kenya as a regional centre for AI research, model innovation, and commercialization.
- Promote African-led AI solutions tailored to local challenges in agriculture, healthcare, education, and governance.

2. AI R&D and Talent Development

- Invest in local AI labs, academic programmes, and research networks to cultivate homegrown expertise.
- Foster public-private partnerships and international collaboration to accelerate innovation.

3. Digital Infrastructure Modernization

- Expand national compute capacity, cloud access, and connectivity to support scalable AI deployment.
- Build open data platforms and secure digital ecosystems for innovation and governance.

Planning Principles

Mission-Driven Innovation:

- Aligns with Kenya Vision 2030 and the Digital Master Plan to address national priorities in healthcare, agriculture, education, and public service delivery.
- Focuses on problem-solving prototypes that deliver measurable socioeconomic impact.

Cross-Sector Collaboration

- Designed as a multi-stakeholder platform involving government, academia, industry, and international partners.
- Encourages co-creation of solutions across sectors, fostering interdisciplinary R&D and commercialization.

Rapid Prototyping and Experimentation

- Operates as a sandbox environment for testing AI models, data frameworks, and emerging technologies.
- Supports agile development cycles to accelerate deployment and iteration of innovations.

Talent Development and Inclusion

- Serves as a training ground for young innovators, researchers, and public sector technologists.
- Promotes inclusive participation, especially for women and marginalized communities in AI development.

Global Benchmarking and Scalability

- Models best practices from Singapore, U.S., India and China, while adapting to Kenya's local context.
- Designs solutions with scalability across counties and exportability to regional markets.

Open Innovation and Knowledge Sharing

- Encourages open-source tools, shared datasets, and Collaborative research.
- Hosts hackathons, challenge grants, and innovation sprints to crowdsource ideas and talent.

AI Innovation Lab Development Framework

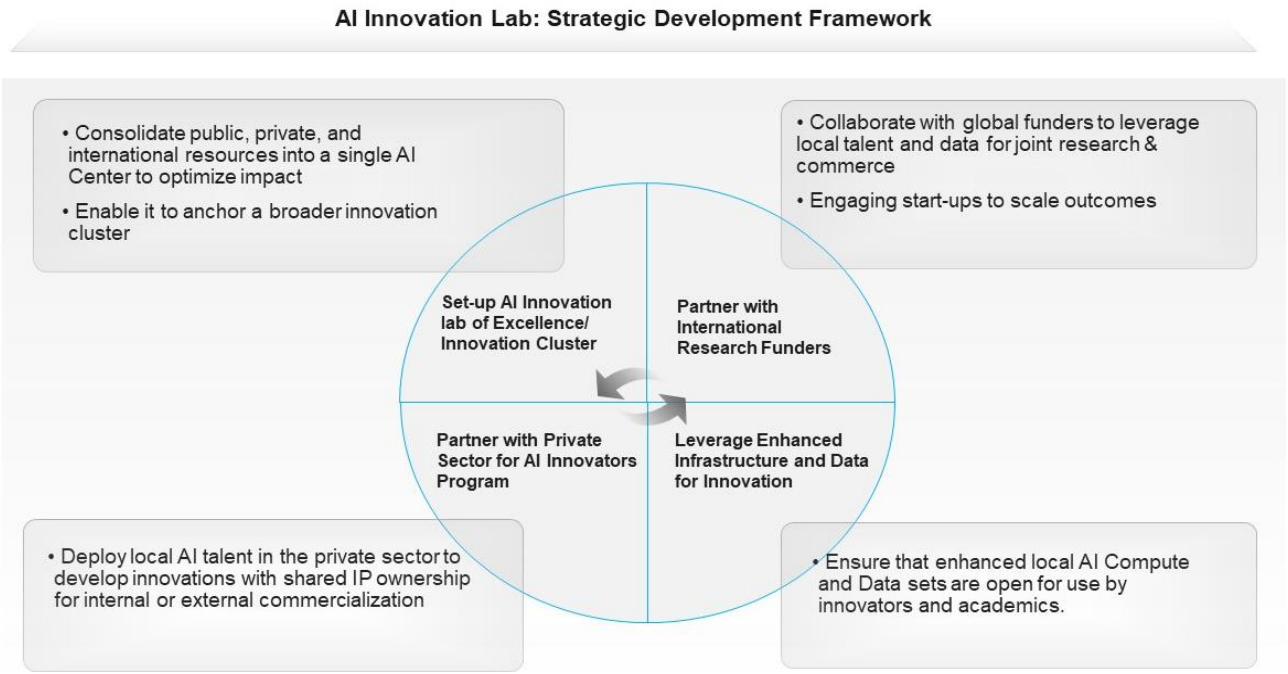

Figure 4.4.1. AI Innovation & International Exchange Planning 2030

Value Proposition

Establishing a local AI innovation lab in Kenya would accelerate inclusive development, strengthen national AI sovereignty, and position Kenya as a regional leader in ethical, locally grounded AI solutions**.**

National Empowerment and AI Sovereignty:

- Local ownership of AI development ensures that technologies align with Kenya's cultural, economic, and social priorities.
- Supports data sovereignty, enabling secure, ethical use of Kenyan datasets for local benefit.

Economic Growth and Innovation Ecosystem

- Catalyzes startups and SMEs by providing access to AI tools, mentorship, and infrastructure.
- Spurs job creation in high-value sectors like data science, machine learning, and AI ethics.
- Encourages cross-sector innovation from agriculture (precision farming) to fintech (AI-powered credit scoring).

Localized Solutions for Public Services

- Enables development of context-aware AI models for healthcare, education, and public safety.
- Facilitates inclusive technologies for underserved populations, such as voice interfaces in local languages.

Global Competitiveness and Strategic Positioning

- Positions Kenya as a regional AI leader in East Africa and the broader Global South.
- Attracts international partnerships and investment by showcasing commitment to ethical, inclusive AI.
- Aligns with global best practices while advancing Kenya's unique innovation narrative.

4.4.2 Strengthening Digital Talent Cultivation

Global Trends

Reforming Basic Education: Governments are focusing on competencies and critical thinking; integrating AI into teaching and re-assessing assessment approaches.

AI-Driven Workforce Design: Organizations are redesigning roles to integrate AI and automation, creating demand for hybrid talent.

AI Talent Crunch: The explosive growth of AI has outpaced traditional education systems, leading to fierce competition for skilled professionals.

War for Talent: High-end talent in high demand.

Application of AI to Industrial Training: Integrating the use of AI solutions in all subjects' education and training programmes to prepare for future jobs.

Kenya Market Insight

Current Situation:

- Regional Leadership: Kenya ranks Tier-1 group in Africa for AI talent readiness, and this reflects strong progress in education, infrastructure, and industry adoption.
- **Education & Training:** Universities like Strathmore, JKUAT, and University of Nairobi now offer programmes in AI, machine learning, and data science. Global partnerships with Kenya Goverment provide subsidized training and certifications together.
- **Youth & Opportunity:** Kenya's young, tech-savvy population is a major asset. The Nairobi's "Silicon Savannah" is fueling developer growth through hubs like iHub, Gearbox, and Nairobi Garage.
- **Digital Literacy**: Kenya's strong ICT foundation—thanks to mobile banking and programmes like the Digital Literacy Programme supports rapid tech adoption.

Development Challenge:

- **Basic Education Reforms Progressing Slowly**: Kenya implementing competency-based education but still faces a significant gap in infrastructure and teacher capacity skills necessary for teaching digital skills and AI.
- **Expertise Shortage**: Faces a significant gap in advanced-level AI experts skilled in designing and training contextually relevant models even though has a strong youth base.
- **Education-Industry Mismatch**: Academic training is misaligned with industry needs. Non-tech professionals including policymakers, educators, and business leaders require AI fluency for ethical and inclusive deployment.

- **Global Exposure for Local Talent**: Tech companies are hiring and training Kenyan developers for global projects, enabling local talent to access international markets.

Development Goals for 2030

Kenya Artificial Intelligent Strategy 2025-2030 has given the specific objectives as below:

- **Close the Skills Gap**: Start the training programme of ICT technologies especially in AI, cybersecurity, cloud computing, and data science to achieve the goal of 350k teacher trained, 300k public servants trained as well 10k field experts trained.
- **Strengthen Education Systems**: Accelerate competency-based education reforms and upgrade infrastructure to support digital learning nationwide.
- **Expand Global Exposure**: Connect Kenyan talent to international markets through remote work, global tech projects, and cross-border training programmes.
- **Align Academia with Industry**: Foster collaboration between universities and employers to ensure training matches real-world needs and emerging technologies.
- **Upskill Non-Tech Professionals**: Promote AI fluency among policymakers, educators, and business leaders to support ethical and inclusive tech adoption.
- **Build Public Sector Capacity**: Train civil servants and professionals through initiatives like the Africa Centre of Competence for Digital and AI Skilling.

Planning Principles:

A developing country, Kenya faces challenges and opportunities in term of cultivating digital talent. Here are some approaching principles to help build a strong digital workforce:

Digital Skills Bootcamps & Micro-Credentials:

- Launch short-term, intensive training programmes focused on practical skills like coding, data analytics, cybersecurity, and cloud computing.
- Partner with global third-party platforms (e.g., Coursera, Microsoft Learn, Huawei ICT Academic) to offer low-cost or free certifications.

University-Industry Collaboration

- Encourage partnerships between academic institutions and tech companies to align curricula with market needs.

- Internships, mentorships, & real-world projects bridges the gap between theory & practice.

Digital Literacy for All

- Promote basic digital literacy across all age groups, especially in rural areas, through mobile learning units and radio/TV campaigns.
- Focus on inclusivity ensure women, people with disabilities, and marginalized groups are actively supported.

Government-Led Talent Pipelines

- Create national digital talent registries and career pathways linked to public sector digitization efforts.
- Offer scholarships and incentives for students pursuing STEM and ICT fields.
- AI & Emerging Tech Exposure
- Introduce AI, blockchain, and IoT concepts early through gamified learning and youth competitions.
- Encourage experimentation with open-source tools and low-code platforms

Digital Talent Cultivation Ecosystem 2030

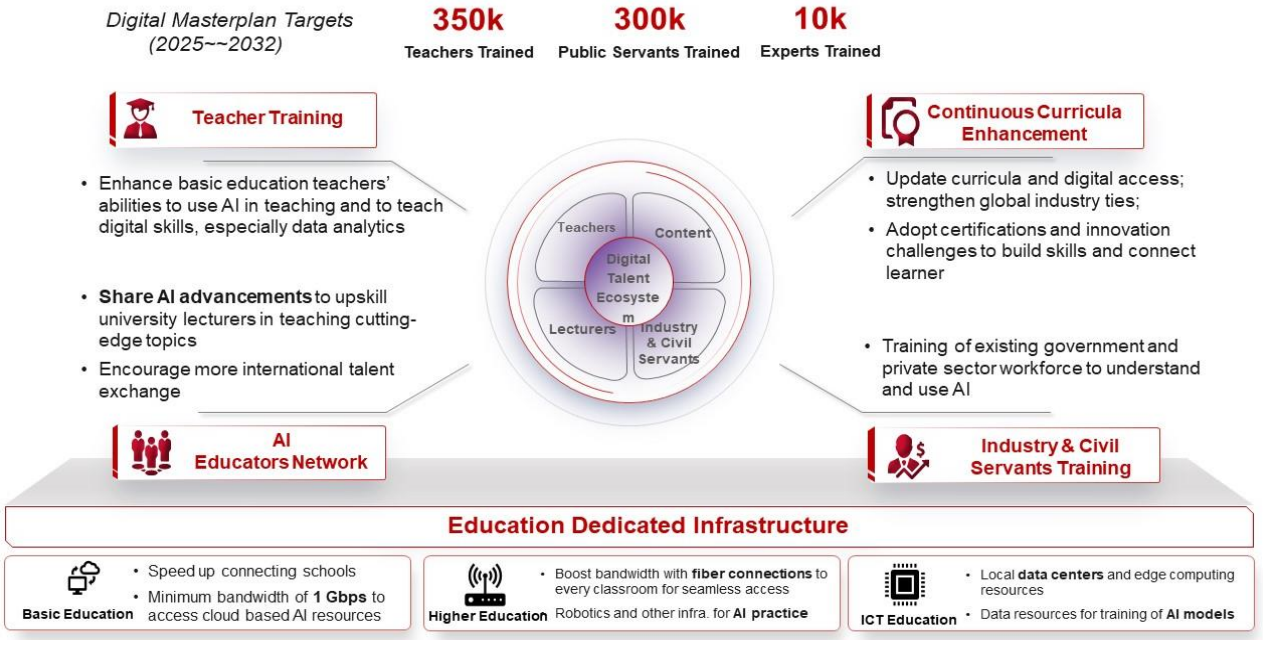

Figure 4.4.2.1. Digital Talent Cultivation Development Framework 2030

4.4.3 Building an Effective International AI Collaboration Framework:

Global Trends

- **Cross-Border Alliances:** Countries are teaming up through initiatives like GPAI and EU–Africa partnerships to co-develop AI and tackle global issues like climate and health.
- **Talent Exchange**: International fellowships and remote work programmes connect AI professionals, boosting knowledge sharing and capacity building.
- **Shared Infrastructure**: Nations invest in open-source models, cloud platforms, and compute resources to lower barriers and foster innovation.
- **Policy Alignment**: Global bodies like OECD and UNESCO promote unified AI ethics, transparency, and responsible deployment across sectors.
- **Inclusive Growth:** Developed countries support AI training and infrastructure in emerging economies to bridge the digital divide.

Kenya Market Insight

Current Situation

- **Global Alignment & Partnerships**: Kenya is aligning with international AI governance norms, reflecting global best practices in data sovereignty and ethical standards.
- **Global Partnerships**: Kenya engages in forums like GPAI and EU–Africa collaborations to shape ethical AI and share innovation.
- **Academic Exchange**: The Universities partner globally for joint research, student programmes, and open data projects like AI4D Africa.
- **Policy Dialogue**: Kenya contributes to global AI governance talks, advocating for African voices in rule-making.
- **Regional Leadership**: Nairobi hosts international summits and hackathons, connecting local startups with global investors and experts.

Development Challenge:

- **Policy & Regulatory Gaps**: Require more stronger legal frameworks for AI ethics, data protection, and cross-border governance to match global standards.

- **Global Integration:** Competing with larger economies in global AI forums requires more visibility, strategic alliances, and diplomatic tech leadership.
- **Inclusive Collaboration**: Ensuring that Kenya's voice is heard in global AI rule-making especially for ethical and inclusive tech is an ongoing challenge.

Development Objectives for 2030

Kenya's AI Strategy 2025–2030 outlines a bold international collaboration agenda to position the country as a globally connected, ethically grounded, and innovation-driven AI leader.

1. Position Kenya as a Regional and Global AI Leader

- Establish Kenya as a continental hub for AI research, innovation, and commercialization.
- Actively participate in global AI dialogues, standards-setting bodies, and multilateral forums.

2. Forge Strategic Global Partnerships

- Collaborate with leading AI nations, institutions, and companies to co-develop solutions and share best practices.
- Leverage partnerships to access advanced infrastructure, training, and funding for local innovation.

3. Align with Global Ethical and Governance Standards

- Develop and adopt interoperable data governance frameworks that reflect global norms while respecting local contexts.
- Champion responsible AI principles, including transparency, fairness, and accountability

4. Amplify African Perspectives in Global AI Development

- Ensure Kenya's voice is heard in shaping inclusive and context-aware AI policies.
- Advocate for African-led innovation that addresses regional priorities and promotes digital sovereignty.

Planning Framework

The Kenya will open and inclusive and actively participate in international AI governance and cooperation. By jointly building AI industrial parks, carrying out joint R&D, and promoting cross-border e-commerce, we will attract more international capital, technology, and talent and promote innovative development of the country's digital economy.

Meanwhile, Kenya will actively participate in the formulation and discussion of international digital economy rules to enhance its voice and influence in international digital economy governance. Specifically, **the following four aspects**:

1. Create an open, shared, and cooperative environment:

- **Advocate the building of a peaceful, secure, open, cooperative** and orderly community of futures in cyberspace, actively safeguard the sovereignty of cyberspace, and strengthen international cooperation in cyberspace.
- **Actively learn from international rules and experience**, rely on bilateral and multilateral cooperation mechanisms, explore and establish governance rules on major issues such as cross-border data flow, market access, data sovereignty and data privacy protection, and continuously optimize investment policies.
- **Optimize market access, increase the opening of the service industry**, explore ways to relax access to new forms of AI Industry, introduce global service multinational companies to set up operation headquarters, R&D and design centres, and procurement and logistics centres in Kenya, and actively introduce high-quality foreign-funded enterprises and entrepreneurial teams.

2. Strengthen international cooperation on digital infrastructure:

- **Accelerate the construction of digital and intelligent new infrastructure**, and jointly promote the construction and upgrading of digital infrastructure such as broadband networks and data centres through the establishment of close cooperation with global AI leading countries.

- **Introduce advanced technology and management experience** to improve the coverage and service quality of domestic information and communication networks.
- **Explore ways to jointly build the advanced digital infrastructure** shared with other nearby countries in East Africa Union, improve Internet bandwidth and transmission quality, and provide strong support for applications such as cross-border e-commerce, distance education, and telemedicine services.

3. Broaden the areas of digital economy cooperation.

- **Strengthen exchanges with the global leading countries** in technological innovation, product research and development, and application promotion, encourage and promote investment cooperation.
- **Jointly build high-tech industrial projects, produce competitive high-value-added products**, and continuously expand the breadth and depth of international cooperation in the digital industry.
- **Encourage foreign enterprises to carry out high-quality cooperation** in the fields of e-commerce, mobile payment, smart cities, telemedicine, digital education, and digital transformation of industries, give full play to the role of digital technology in promoting high-quality economic development and improving social and livelihood, and share the dividends of digital economic development with the people of the country.

4. Innovative international cooperation and exchange models.

- **Establish and improve a mechanism for talent exchange and cooperation**, and actively expand cooperation along the Belt and Road and with developing countries in the areas of transnational education projects, curriculum resources sharing, exchange visits between teachers and students, and transnational exchange and training of skilled personnel. Implement a more active talent introduction policy to attract foreign high-end digital talents to Kenya for innovation and entrepreneurship.
- **Strengthen cooperation with countries along the AI-related fields** by jointly building incubation platforms, setting up laboratories, and establishing R&D strategic alliances.

Support the holding of high-level international AI forums and exhibitions to build a high-end platform for international exchanges and cooperation and promote international experience exchange and sharing.

- **Deepen inter-governmental dialogue and exchanges on the AI,** share AI policy practices and capacity building, strengthen synergy with other countries' AI strategies, and work together to ensure top-level design, standard alignment and rule-making. We encourage scholars and entrepreneurs in the AI field to actively participate in the work of relevant international organizations, actively participate in the formulation of international standards and rules related to the AI governance, and make more of their own voices on the global AI stage.

Value Proposition

Shared Knowledge & Innovation

- Cross-border collaboration accelerates innovation by pooling diverse expertise, datasets, and research.
- Open-source initiatives and joint R&D projects democratize access to cutting-edge tools and ideas.

Inclusive & Ethical AI Development

- Global dialogue helps shape inclusive governance frameworks that reflect varied cultural, ethical, and legal perspectives.
- Developing countries gain a seat at the table, ensuring AI benefits are distributed equitably—not just concentrated in tech-dominant nations.

Infrastructure & Capacity Building

- International partnerships support the development of digital infrastructure from broadband to data centres especially in emerging economies.
- Talent exchange programmes and transnational education foster a skilled global workforce ready to build and manage AI systems.

Harmonized Standards & Regulation

- Cooperation enables the creation of shared standards for data privacy, algorithmic transparency, and cross-border data flows.
- This reduces fragmentation and builds trust in AI systems across jurisdictions.

Economic Growth & Market Access

- Joint ventures and multinational collaborations open new markets for AI products and services.
- Countries can attract foreign investment, boost local innovation, and integrate into global AI value chains.

4.5. Promoting Agile Governance & Inclusive Development Culture

Kenya will advance AI through agile governance and inclusive development.

- **Agile Governance**: Flexible, participatory frameworks will balance innovation with public interest, enable rapid policy iteration, and support experimentation via sandboxes and pilots.
- **Inclusive Development**: Broad stakeholder participation will ensure AI drives growth, equity, and universal benefits while safeguarding national values and cultural continuity within Kenya's sustainable development vision.

4.5.1 Global AI Governance Situation alongside Kenya's positioning

AI governance is rapidly evolving worldwide. The EU codes ethics into law, while the US leans on innovation-first self-governance. China embeds alignment within its national strategy, and African states are experimenting with sectoral policies. This surge indicates a growing acknowledgment of the potential risks and benefits associated with AI, prompting diverse legislative approaches tailored to specific regional contexts. The specific case is below for your reference:

European Union (EU) – Regulatory Benchmark:

- EU AI Act (2024) released: First comprehensive AI law worldwide.
- Risk-based approach: Classifies AI systems into minimal, limited, high, and unacceptable risk categories.

- Key measures: Bans harmful uses (e.g., social scoring), mandates transparency and compliance for high-risk applications.
- Global impact: Serves as a benchmark influencing other jurisdictions

United States (US) – Driven Flexibility:

- Decentralized governance: No single federal law; regulation is sectoral and agency-driven.
- Guidelines: NIST and FTC emphasize standards, fairness, and consumer protection.
- Focus: Innovation, competition, and voluntary compliance rather than rigid regulation.

China – State Leading firstly:

- State-led governance: Strong regulatory oversight of generative AI, algorithms, and content moderation.
- Integration: AI governance embedded in cybersecurity and national security frameworks.
- Strategic goal: Industrial leadership while ensuring social stability and state control.

Multilateral Efforts – Global Harmonization:

- UN Global Digital Compact (2024) and Global Dialogue on AI Governance (2025): Aim to harmonize global standards.
- Principles: Inclusivity, ethics, and capacity-building across nations.
- Trend: Growing momentum for international cooperation despite geopolitical fragmentation.
- In Kenya, while specific AI regulations are still in development, existing laws such as the Data Protection Act and the Consumer Protection Act provide a foundational framework for addressing issues related to AI, and but until now Kenya does not have a comprehensive and specific regulatory framework for AI.

Kenya's current regulatory environment for AI is fragmented, with multiple bodies working independently without a unified approach. This fragmentation leads to inconsistencies and inefficiencies in AI governance, making it challenging to create a cohesive strategy for AI development and deployment. The absence of robust AI-specific governance frameworks also limits adoption of AI in the public sector and in regulated sectors where errors and

harms from AI deployment could diminish public trust, increase inequality, and degrade quality of service provision.

4.5.2 Establish a comprehensive and Specific Framework for AI development

A **comprehensive policy framework** for AI and emerging technologies is necessary to provide direction and coherence in Kenya's AI strategy. This framework must include agile AI legal and regulatory structures, along with monitoring and oversight mechanisms that evolve with the rapidly changing technology landscape. The development of AI risk and safety frameworks will ensure that Kenya develops trustworthy AI systems that operate securely and ethically, minimizing potential harms. Effective stakeholder collaborations between government, academia, civil society, and industry are essential to align AI initiatives with national priorities and ensure accountability in the governance of AI technologies. These are **four strategic pillars** scheduled in the policy framework to be implemented as below:

Pillar 1: Establish a Harmonized National Policy Framework for AI and Emerging Technologies

Objective: Create a coherent and comprehensive policy environment that aligns national priorities and accelerates responsible AI adoption.

Initiatives:

- Develop a National AI and Emerging Technologies Policy aligned with the National AI Strategy 2025–2030, ensuring consistency across sectors and institutions.
- Formulate a National Cybersecurity Policy to safeguard digital infrastructure, data assets, and AI systems.

Outcomes: **A unified policy framework** that enables strategic alignment, regulatory clarity, and coordinated implementation across Kenya's digital transformation agenda.

Pillar 2: Establish a Risk and Safety Governance Framework for AI Development

Objective: Ensure trustworthy, ethical, and secure AI systems through robust technical and institutional safeguards.

Initiatives:

- Develop localized ethical and safety standards tailored to Kenya's context, drawing from global best practices.
- Operationalize these standards via conformity assessment schemes, safety audits, and technical regulations to ensure compliance and accountability.
- Establish a National AI Risk and Safety Institute to lead research, oversight, and capacity building in AI safety and governance.

Outcomes: Enhanced national capability to manage AI risks, uphold public trust, and promote responsible innovation.

Pillar 3: Revise and Develop Agile Legal and Regulatory Frameworks for AI

Objective: Ensure Kenya's legal and regulatory environment remains adaptive, future-proof, and aligned with the dynamic evolution of AI and emerging technologies.

Initiatives:

- Conduct a comprehensive review of existing legislation—including employment and labour relations, intellectual property, and cybercrime laws—to reflect the unique demands and implications of AI and emerging technologies.
- Promote regional harmonization of data protection, taxation, and cybersecurity laws across East Africa to enable secure, compliant cross-border data flows and enhance regional competitiveness in AI innovation.
- Implement a soft regulatory framework for AI, emphasizing guidance, voluntary standards, and co-regulation to foster innovation while managing risks.
- As AI capabilities mature, develop a dedicated AI and Emerging Technologies Act, supported by sector-specific regulations to ensure legal clarity and enforceability.
- Establish a flexible regulatory environment using regulatory sandboxes to test AI applications, inform policy development, and refine technical standards in real-world settings.

Outcome: A modernized, responsive legal framework that supports innovation, safeguards public interest, and ensures Kenya's readiness for the evolving AI landscape

Pillar 4: Foster Collaborative and Inclusive AI Governance Across Sectors and Borders

Objective: Strengthen Kenya's AI governance ecosystem through coordinated engagement with the stakeholders and active participation in regional and global platforms.

Initiatives:

- Develop and implement an AI and Emerging Technologies Diplomacy Programme to position Kenya as a proactive contributor to international AI policy dialogue, standards-setting, and innovation partnerships.
- Promote regional and international cooperation to facilitate knowledge exchange, harmonize AI standards, and jointly address cross-border AI challenges ensuring Kenya's active integration into the global AI and emerging tech ecosystem.
- Enhance multi-stakeholder participation in AI policymaking and programming by engaging the public, developers, civil society, and consumers fostering transparency, trust, and inclusive innovation.
- Outcomes: Coordinated cross-border governance mechanisms to address shared AI risks and opportunities, and strengthened public support and stakeholder buy-in for AI policies, programmes, and ethical deployment.

5. Prospects for the Development of AI Toward 2030 in Kenya

With globalization and digitalization interweaving, Kenya is standing at a new starting point for the development of the AI industry, showing great potential and broad prospects for development of the AI-driven economy. Based on the actual conditions of Kenya, the previous chapters of this report sort out the **key actions and roadmap required** for developing the AI industry and to complete the overall vision for the Kenya AI Strategy 2025-2030.

The development of the AI industry is a huge and complex system project, which requires the joint efforts of governments, enterprises, and all sectors of society. To further unlock the potential of the AI industry and ensure the steady and orderly development of the economy and society, Kenya will focus on improving its laws and regulations on the AI governance and expanding international multilateral cooperation. Here are several ideas for reference.

5.1 Playing a leading role in key areas of AI development

AI computing infrastructure, the backbone of the digital economy, is accelerating intelligent transformation across industries and powering new productive forces. To fully realize its impact, stakeholders including government, enterprises, investors, and operators must focus on three dimensions: demand scenarios, core capabilities, and implementation ecosystems. The priority is to build mechanisms that are clearly positioned, capability-driven, and ecosystem-oriented.

As Kenya advances a national integrated computing network, resources will be efficiently scheduled and broadly accessible. AI infrastructure will become a strategic driver of Kenya’s high-quality growth and a source of new competitive advantage in Africa.

1. Government departments as guides for demand scenarios

Top-level design and planning must lead, aligning with local industrial strengths to formulate regional development plans for intelligent computing centers and set clear industry priorities. This ensures precise matching of computing resources with demand while avoiding blind expansion and repetitive construction. Governments should also open application scenarios

in smart cities, digital governance, intelligent transport, and urban management, creating "first purchase, first use" opportunities for local services.

National investment platforms should serve as connectors, linking enterprises with urgent needs to computing centers and fostering benchmark cases of digital transformation. They should also invest in downstream AI firms' algorithms and application solutions to extend and strengthen the industrial chain.

Operators should act as trackers, building industry-focused teams to identify pain points and niche demands, deliver tailored solutions, and keep pace with AI model evolution to drive scenario development and facility upgrades.

2. Government guidance for building core capabilities

Governments will guide industry organizations to continuously advance the construction and improvement of intelligent computing center capability systems. For three major categories of scenarios, they should refine evaluation indicators around foundational support capabilities, innovative service capabilities, and operational assurance capabilities, enriching the dimensions of assessment. Standardized construction references should be introduced to improve alignment between supply and market demand.

Operators should enhance core capabilities in a targeted manner based on different enabling scenarios. From industrial practice, intelligent computing centers urgently need to strengthen capabilities supporting data processing services, computing resource scheduling (providing elastic computing, storage, and network resources), and inference application services. Moreover, integrated training–inference solutions have become an important measure for enhancing core capabilities. By optimizing and efficiently scheduling resources at the computing base, intelligent computing centers can provide users with AI model development, training, and inference acceleration services.

3. Government support for ecosystem development

Governments will strengthen guidance and resource coordination for ecosystem implementation. First, they should support the advancement of intelligent computing center ecosystem partner programs, soliciting, certifying, and integrating partner software and algorithms to jointly deliver “integrated solutions” to the market. Second, they should establish intelligent computing industrial parks, with computing centers at the core, complemented by AI industrial parks that attract algorithm companies, data service providers, and application developers, forming an industrial cluster of “computing + data + algorithms + applications.” Third, they should explore co-construction of “intelligent computing centers + AI data” ecosystems by government and enterprises. By combining enterprise industry data with government priority industries and public data, and focusing on specific tracks and application scenarios, intelligent computing centers can jointly develop industry-specific large models and intelligent solutions, thereby co-building a robust industrial ecosystem.

5.2 Improve laws and regulations on the AI Development

The Kenya has been fully aware of the importance of the legal framework for the healthy development of the AI industry. This means building a comprehensive, systematic and current legal system to address the new challenges and opportunities presented by this report of the implementation roadmap. Including but not limited to the formulation or revision of laws and regulations on data security, personal information protection, e-commerce, and online transactions, to ensure that all activities of the AI can operate on the track of the rule of law. At the same time, the government will strengthen law enforcement, improve regulatory effectiveness, ensure the effective implementation of laws and regulations, and create a fair, transparent and predictable market environment for the digital economy.

1. Strengthen top-level design and legislative guidance

At the national level, the strategic positioning of building the rule of law in the AI field has been clearly defined and incorporated into the national informatization development strategy and planning. In response to the challenges posed by emerging technologies such as artificial

intelligence, cloud computing, and the Internet of Things, existing laws will be revised in a timely manner and new regulations formulated where necessary. These legal frameworks will be applied scientifically to guide the sound development of emerging fields.

We will strengthen the convergence and coordination of policies and regulations, ensuring alignment between supporting measures and regulatory instruments. By fostering synergy across the policy and regulatory landscape, we will promote the integrated development of the AI industry and governance. This will gradually create a favorable environment for the orderly and healthy growth of the AI sector.

2. Establish and improve the digital infrastructure system

We will accelerate the establishment of a comprehensive data property rights system, developing clear rules for diverse rights-confirmation scenarios and for the circulation and transaction of data. Our objective is to ensure equal protection and a balanced distribution of rights and interests across personal, enterprise, and public data.

We will enhance the data circulation and transaction framework by refining the regulatory architecture and codifying a robust set of rules. In accordance with the law, we will actively promote the inclusion of public, enterprise, and personal data into the data market, while strengthening transparency in data supply and authorization management.

We will reinforce the rule of law in the AI industry, define clear pathways for cross-border data flows and digital trade, and engage proactively in shaping the transformation of the global governance system. At the same time, we will contribute to the formulation of international rules governing AI industry development and digital trade.

3. Improve data security protection capabilities

We will establish a classified and hierarchical protection system covering the entire data life cycle, while strengthening monitoring and evaluation of high-risk stages such as collection, storage, sharing, circulation, and use. This will significantly enhance the security assurance capacity of national data resources.

We will expand support for research into foundational data security theories, frontier technologies, and critical applications. Priority will be given to advancing key capabilities such as privacy-preserving computation and data flow analysis, ensuring robust safeguards against leakage and tampering.

We will promote the systematic development of data security disciplines and specialties across universities and vocational institutions. National professional standards for data security engineering technicians will be formulated and promulgated, alongside the implementation of digital technical engineer training programmes. Through these measures, we will cultivate and expand a strong cadre of high-level data security engineers.

4. Standardize the healthy development of the AI Ecosystem

We will establish an open national AI computing power platform to deliver services including innovation support, supply-demand interconnection, production integration, capability evaluation, and vocational training. This platform will enable centralized sharing of industry information, precise alignment of supply and demand, and agile responsiveness to public service needs.

We will create a robust data sharing and exchange mechanism by defining the scope and format of shareable data, and by developing standards and protocols that ensure compliance and lawful use of enterprise and personal data.

We will strengthen the governance of digital platforms through the formulation of supervisory laws, clarifying their primary responsibilities, and fostering a model of diversified co-governance. Common guidelines will be promoted to support coordination and consultation among platforms, with supervision and governance applied across the full cycle of innovation, production, operation, and investment.

ANNEXES:

Annex 1: Recommended Industry Policies for AI Development

Field	Existing Policy	Near to Mid Term (2026~2027)	Mid to Long Term (2028~2030)
Data Centre Facility	ICT Authority Data Centre Standard 2019	National AI Data Centre Construction Standards 2030	……
	…….	The Preferential Policies on land, electricity, and taxation in data center industrial park	The Policies on Academic Research Collaboration & Talent Attraction in DC Industrial Park
	…….	Data Center Renewable Energy Promotion Policy	…….
Cloud AI Data	Kenya AI Strategy 2025-2030	AI Strategy 2025-2030 Implementation Roadmap	……
	Cloud First Policy	Cloud First Policy Update	
	……	Regulation of AI Applications and Security	Guidelines for the Prevention of Ethical and Security Risks in AI
	……	Administrative Measures for Generative Artificial Intelligence Services	Administrative Measures updates
	National Data Governance Policy (2025)		National Data Governance Policy Update
	The Data Protection Act, No. 24 of 2019	National Regulations on Government Data Administration	National Regulations Updates
	Data Protection General Regulation 2021	National Data Governance Standards	……

	Revised Cybersecurity Strategy 2025 - 2029	New Data Privacy Protection and Cybersecurity Policy	
	……	National Data Sovereignty Policies	Implementation Guidelines for National Data Sovereignty
Fibre Network	On-line Fibre ROW Monitor Platform Kenya Fibre Infra GIS Database	National Broadband Quality Monitor Platform	Fibre Infrastructure Sharing Code
	USF Support Fibre Construction	National Giga City Incentive Plan	Fibre infra incentive subsidy plan USF support public Wifi Coverage plan
	Fibre Pre-deployment Code	Kenya Fibre Engineering Code (FTTH, Data center, Backbone, Campus)	……
Wireless Network	700MHz Spectrum Assignment for 5G		2.6/2.3G Spectrum Assignment for 5G (U6G/600M Spectrum assignment on demand)
	……	5G*AI Industry Ecosystem 1.0 (APP: Servicing ToC and ToB (Education, Healthcare..) (Device: AI phone/Pad)	5G*AI Industry Ecosystem 2.0 (APP: AI Agent, AI production/Driving) (Device: AI wearable/ CPE/ Machine/vehicle)

	……	5G*AI QoS Measurement & Regulation 1.0 （QoS mechanism oriented 5G*AI target network）	5G*AI QoS Measurement & Regulation 2.0 （QoS regulation Fulfilment and upgrade）
IP Network	Kenya IPv6 Migration Strategy	Kenya Future Network Strategy toward 2032	Kenya Future Network Strategy toward 2032 update
	Kenya National Digital Master Plan （2022-2032）	AI-driven Kenya National Digital Master Plan （2022-2032) Updates	

Annex 2: Recommended Sectoral Initiatives for AI Development

Field	Existing Project	Near to Mid Term（2026~2027）	Mid to Long Term（2028~2030）
DC Facility	Konza DC I & II Phase	Construction of First AIDC（Baringo）	Construction of Second AIDC (Nairobi)
	……	Upgrade Konza DC to the AIDC	Edge DC (On Demand)
Cloud & AI & Dataset	Cloud Security Services	Secure Services expansion (Cloud WAF, firewall, Disaster Redundancy, etc.)	New Cloud Security Services or Expansion
	Cloud migration of Central government agencies	Cloud Migration of Public service providing ministries	Cloud migration of more other Ministries' Service
	……	AI-enabled Pan-Government industries' App. (Public Services, Healthcare, Education. etc.)	AI-enabled More Industries' App. (Tourism, Transportation, Agriculture, Manufacturing, etc.)
	……	Development of Population and Economic Foundational Databases	Development of Legal Entities, Natural Resources, and Electronic Licenses Databases
	……	Development of High-Quality Datasets for Language and E-Government	Development of High-Quality Datasets for Education, Healthcare, Retail, Finance, Manufacturing, Energy，etc.

	……	Government Unified Data Sharing and Exchange Platform	Social Data Governance, Sharing & Exchange System
	……	Adaptation and Localization Fine-Tuning of Large Language Models	Development and Training of **Locally-Based** Large Language Models
	……	Development of Large Language Models (for Government)	Development of Large Language Model expand (for Education, Healthcare, Retail, Financial, Manufacturing, Energy)
	……	……	Developing Large Model Service Capabilities for a Digital Hub in East Africa
	……	Basic AI Innovation Lab	AI Tech Innovation Lab
Fibre Network	Digital Super Highway Phase I (Fibre Universal Coverage)	Digital Super Highway Phase I (Backbone) Digital Super Highway Phase II (Last Mile Fiber Access)	Digital Super Highway Phase-II(Last Mile Fiber)
	…..	……	Public Wi-Fi Universal Coverage Project (Rural, Urban)
	NOFBI	Kenya "Light-Bridge" Digital Transport Backbone Project (Africa Data Hub, 400G Transport)	Kenya Submarine and IPX Expansion Plan
	LMCCP	"Light Rural School" Project (10K Rual School Fiber Connectivity	"Health Fiber Bridget" Project (50K Health Center and Hospital Fiber Connectivity)

Wireless Network	5G Network	5G x AI Target Network Plan 1.0 （C-band, 700M）	5G x AI Target Network Plan 2.0 （C-band/2.6/2.3G,700M ； On demand: U6G/600M）
IP Network	NOFBI	Nairobi–Mombasa SRv6 Pilot	AI WAN Phase 2
	Konza DCN Network	Inter-DC SRv6 Network	National AI Compute Network
	EAC ICT Backbone Network	EAC Corridor Interconnect Pilot	EAC Unified Operation Platform