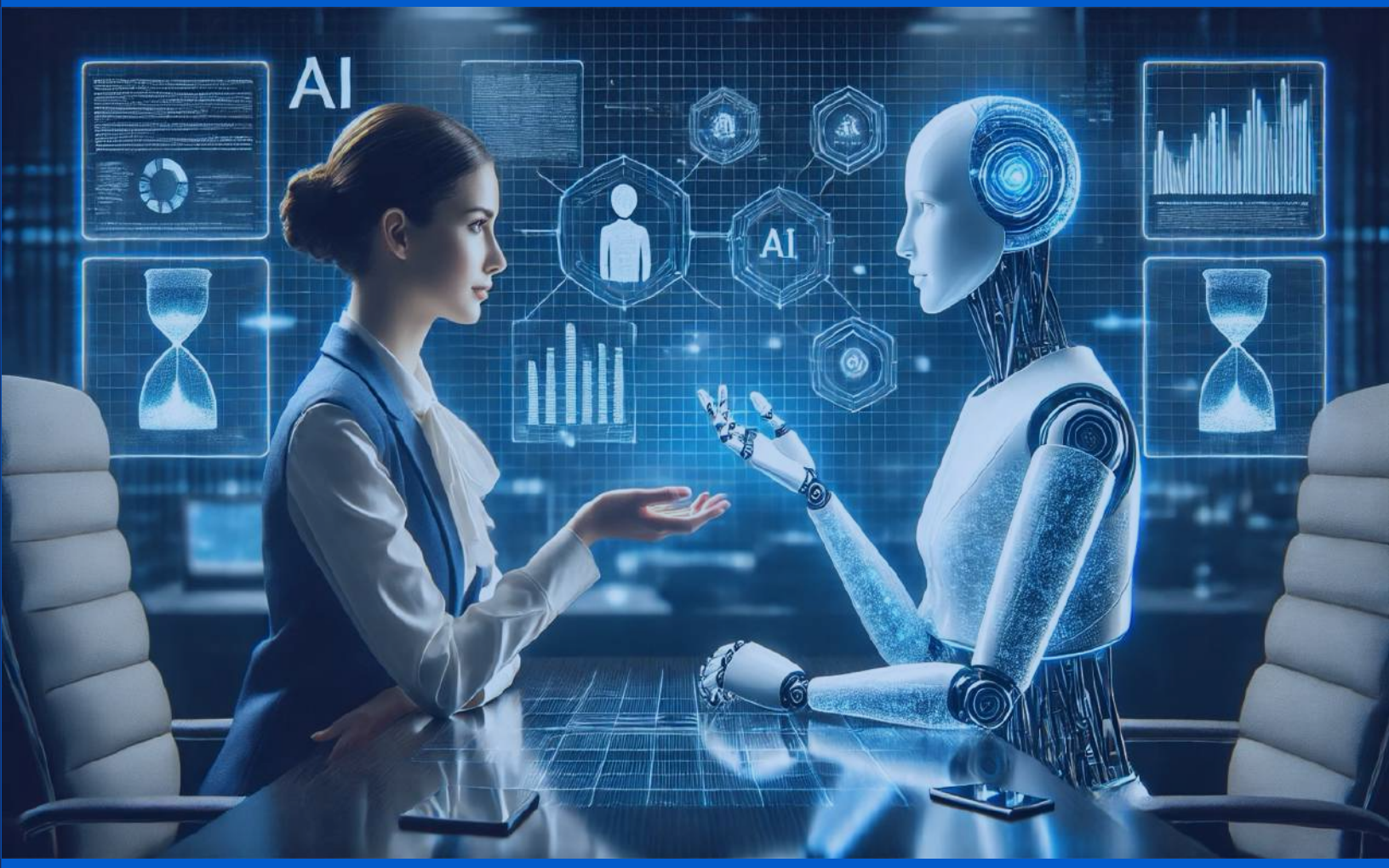
Digital Cooperation Organization

AI-REAL TOOLKIT

AI READINESS TO EMPOWERMENT, ADOPTION, AND LEADERSHIP



BENCHMARKING ANALYSIS DOCUMENT

GUIDING NATIONS FROM READINESS TO AI ADOPTION & LEADERSHIP

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1. EXECUTIVE SUMMARY

Artificial Intelligence (AI) has transitioned from a future notion to a present-day reality that is transforming the operations of governments, industries, and communities. Recent improvements in artificial intelligence, propelled by discoveries in machine learning, natural language processing, and generative AI, are swiftly transforming the domains of invention, cooperation, and advancement. The use of AI is propelling growth in the economy, improving operational efficiency, and creating unprecedented possibilities across all sectors.

AI promotes innovation, automates procedures, increasing productivity, and bolstering national competitiveness through the modernization of industries and sectors. It also plays a vital role in addressing global concerns such as climate change and healthcare. Consequently, it is imperative for nations, especially the DCO Member States, to embrace AI to attain sustainable development and prosperity.

The DCO is developing an AI-REAL (AI Readiness to Empowerment, Adoption, and Leadership) Toolkit to facilitate and accelerate the assessment of AI readiness and its adoption by the countries worldwide, including the DCO Member States. This toolkit will offer a structured AI readiness assessment, adoption guidelines, artifacts, and a roadmap aligned with global best practices. By benchmarking the AI success factors of global AI-leading and emerging nations, the toolkit will assist all the countries in achieving AI maturity efficiently, empowering them to leverage AI for growth, innovation, and global competitiveness.

Benchmarking analysis involves understanding the best practices, strategies, and key initiatives from global AI-leading and emerging nations that can be adopted by the countries globally, including the DCO Member States. This benchmarking analysis document focuses on pulling key insights from global AI leaders like the USA, UK, Singapore, and UAE, as well as emerging nations like Benin. These countries showcase some of the best practices in areas such as government policies, technological innovation, data infrastructure, talent development, and the overall economic impact of AI. One thing that stands out is how important public-private partnerships are in driving innovation and turning AI technologies into real-world applications.

There is also a strong emphasis on building AI systems that adhere to ethical principles like transparency, fairness, and accountability. These are crucial for earning public trust, protecting privacy, upholding users' rights, and staying compliant with legal regulations. International collaboration is equally important since it gives countries a chance to share best practices, shape global standards, and tackle common challenges together.

To address these shared challenges in AI development, one solution is to harmonize AI policies and legal frameworks across countries. This makes cross-border collaboration smoother. Sharing resources is another key approach—by pooling data, infrastructure, and research results, countries can avoid duplicating efforts and accelerate AI advancements along faster. Efforts to standardize AI at the global level also ensure systems remain transparent, fair, and accountable by following universally accepted ethical guidelines. Additionally, forming joint AI ethics committees across borders can help promote ethical AI development and reduce biases. These collaborative efforts significantly contribute to building trust and creating a unified approach to AI challenges.

Through this benchmarking analysis, countries can gain valuable insights from both leading and emerging AI nations, helping them develop strong AI ecosystems tailored to their specific needs. By focusing on different aspects of AI development, the countries can speed up their digital transformation and drive sustainable growth, putting them in a great position to become global leaders in AI.

2. INTRODUCTION

Artificial Intelligence is increasingly recognized as a pivotal technology that will shape the future of economies and societies worldwide. As nations strive to harness AI's transformative potential, understanding and implementing best practices in AI readiness and deployment has become critical to achieving a competitive advantage.

The DCO is creating an AI-REAL Toolkit designed to expedite the assessment and adoption of AI across its Member States. This toolkit will feature a structured AI readiness evaluation, adoption frameworks, AI artifacts, and a strategic roadmap aligned with international best practices. By leveraging insights from leading and emerging AI-driven nations, the toolkit will support the countries globally, including the DCO Member States in efficiently advancing their AI maturity and adoption.

Benchmarking global AI leading and emerging countries is essential for preparing an AI readiness assessment and adoption toolkit. It helps identify best practices, learn from challenges, and understand key initiatives that drive AI development. Benchmarking provides valuable insights into effective strategies and policies, informs policy development, and ensures the toolkit is adaptable to different contexts and needs.

This document presents a benchmarking analysis aimed at identifying leading and emerging nations in AI adoption. And evaluates these countries to extract key insights, pinpoint success factors, and highlight initiatives that can inspire the countries to become future AI leaders.

2.1 Benchmarking Analysis Methodology

Define Benchmarking Dimensions	Identify AI Champion Countries	Undertake Benchmarking Analysis	Identify Best Practices, Key Learnings & Initiatives

Define Benchmarking Dimensions: Finalise benchmarking dimensions and associated sub-dimensions tailored to the unique characteristics and requirements of both developed and developing countries worldwide, including the DCO Member States. This involves identifying the specific aspects that will be used to assess AI readiness and adoption. The benchmarking dimensions and sub-dimensions provides a robust foundation for evaluating the progress of Member States and guiding them towards effective AI adoption.

Identify Global AI Leading Countries: Conduct a thorough analysis to identify countries that have established themselves as leaders or emerging players in the field of AI. This step involves looking at a range of defined indicators. By pinpointing these global AI-leading nations, the interested countries can gain insights into successful strategies and approaches that can be adapted to their contexts.

Undertake Benchmarking Analysis: Perform a detailed benchmarking analysis through secondary research on the identified global AI-leading countries. This research involves reviewing existing reports, case studies, policy documents, and other relevant sources that provide information on these countries' AI initiatives and outcomes. The analysis focuses on the predefined benchmarking aspects, systematically documenting the findings and assessing how each country measures up in various aspects of AI readiness and adoption. This step is critical for understanding the specific factors that contribute to a country's success in AI and identifying gaps and opportunities for improvement for the countries.

Identify Best Practices, Key Learnings & Initiatives: After the benchmarking analysis, document the best practices that have been instrumental in the success of global AI-leading and emerging countries. This includes exploring successful AI adoption strategies, innovative policies, and initiatives that have significantly advanced AI capabilities. By identifying the latest AI initiatives and trends, the DCO can capture best practices that benefit the Member States, offering valuable guidance to accelerate AI adoption and foster economic growth. This strategic support not only strengthens AI adoption but also aligns with global advancements, ensuring the countries are well-equipped to thrive in the evolving AI landscape.

3. PURPOSE OF BENCHMARKING & ITS KEY DIMENSIONS

3.1 Purpose of Benchmarking

Benchmarking global AI leading and emerging countries is crucial for accelerating AI development and staying competitive in the evolving global digital landscape. It provides insights into best practices, key initiatives, successful strategies, and effective policies. Benchmarking analysis identifies factors that contribute to AI success, such as regulatory frameworks, policy initiatives, and technological infrastructure, offering proven strategies for fostering AI growth globally.

Additionally, benchmarking highlights challenges faced by AI leaders and the solutions they implemented, offering valuable lessons for other countries. It supports tailored recommendations, promotes international collaboration, and encourages innovation.

Ultimately, benchmarking analysis helps establish standards providing a clear roadmap for countries to assess their AI readiness and progress, fostering a more inclusive and informed global AI landscape. To achieve these objectives, the benchmarking analysis is structured around the following key questions:

What strategies do global AI leading and emerging countries adopt to successfully adopt, regulate, and integrate AI across public and private sectors?

The focus is to examines how government policies & regulations in AI-leading nations create an enabling environment for AI by strategically crafting and implementing policies that address opportunities and challenges in both public and private sectors.

How do global AI leading and emerging countries advance their technology infrastructure and ensure readiness for the integration of AI across various

Examines the technology advancements & readiness that supports AI deployment in various sectors. It looks at the efforts made by countries to build and maintain robust technological frameworks that can integrate and sustaining AI technologies.

How do they build and maintain robust data ecosystem to support the development and deployment of AI technologies?

The focus is on the data and infrastructure ecosystems within AI-leading countries. The analysis delves into how these countries manage data collection, storage, processing, and sharing, ensuring that data infrastructure is sufficient to meet the demands of AI technologies.

How do these countries measure and enhance the impact of AI on their economies, including growth, productivity, and job creation?

Understand the impact of AI on the economy. It considers the metrics and methodologies used by global AI leading countries to measure the contribution of AI to economic growth, productivity improvements, and job creation, highlighting the tangible benefits of AI adoption.

How do they prioritize and implement AI initiatives in key sectors like education, healthcare, and skills development to drive innovation and improve outcomes?

Explore how AI is being applied in focus sectors such as talent and skill development, education, healthcare etc. It examines the strategies of AI initiatives in these sectors and evaluates their effectiveness in driving innovation and achieving better outcomes.

To answer these questions, the benchmarking aspects and dimensions are established that would be used to assess the global AI leading countries. This will provide valuable insights into the best practices, initiatives, policies, and strategies that have been effective in various contexts. These insights are crucial for finalizing the foundational AI pillars and focus sectors of toolkit, which will serve as a guide for the countries globally, including the DCO Member States looking to build robust AI capabilities.

3.2 Benchmarking Dimensions

To align with the goals of benchmarking and to support AI readiness and adoption efforts, extensive research has been carried out to determine key dimensions that will form the basis of our assessment. These dimensions and sub-dimensions, as shown in Figure 1, have been developed through a thorough literature review and consultations with subject matter experts from AI domain, ensuring alignment to the benchmarking objectives.

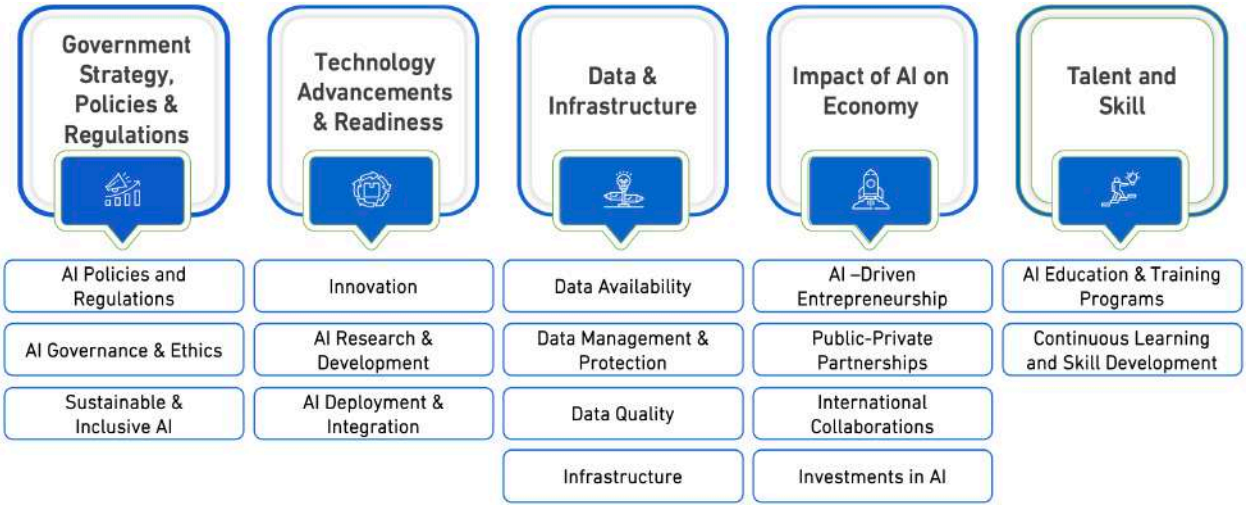


Figure 1: Benchmarking Dimensions & Associated Sub-dimensions

A list of AI pillars, identified from the reviewed literature and included in the appendix, highlights common themes and recurring elements found across various literature sources. These AI pillars were considered while finalizing these five main benchmarking dimensions and their associated sub-dimensions aiming to provide valuable insights based on the experiences and practices of countries that are leaders in the AI domain.

Government Strategy, Policies & Regulations

This dimension focuses on understanding the government's strategic vision and governance of AI, emphasizing ethical and responsible use of AI. This dimension underlines the priorities, frameworks, and oversight to ensure transparency, accountability, & fairness in AI adoption.

- AI Policies and Regulations: Development and enforcement of policies, regulations and guidelines to ensure responsible AI usage, promoting transparency, fairness, and accountability.
- AI Governance & Ethics: Exploring the principles-based approaches, such as those used in the US and Singapore, which offer flexibility; and prescriptive frameworks in the UK and UAE that ensure enforceability. Understanding the key imperatives for governing AI, promoting innovation, and upholding ethical, legal, and security standards. Additionally, analysing the rising trend of approaches to AI governance, blending flexibility with clear regulations for effective oversight to achieve responsible use of AI.
- Sustainable & Inclusive AI: Adopting the approaches and analysing the growing trend toward achieving sustainable and inclusive AI.

Technology Advancements & Readiness

Evaluates the maturity of AI technologies, the level of innovation, the business environment's readiness, the availability and expertise of human capital, and the extent of research and development activities related to AI.

- Innovation: Fostering innovation in AI technologies through research grants, innovation hubs, and collaborations between public and private sectors, especially in the focus sectors.
- AI Research and Development: Investing in R&D to push the boundaries of AI technologies, including machine learning, robotics, and natural language processing.
- AI Deployment and Integration: Strategies for effective deployment of AI across various sectors, ensuring integration with existing systems.

Data & Infrastructure

Assesses the availability, quality, and representativeness of data, as well as the supporting infrastructure necessary for effective AI adoption. Understand how the selected countries are:

- Data Availability: Ensuring that complete high-quality datasets in appropriate format are available for training and developing AI models.
- Data Management & Protection: Implementing robust data management systems and protection mechanisms to ensure data integrity and privacy.
- Data Quality: Focusing on accuracy, consistency, and reliability of current as well as future data used in development of inclusive AI applications.
- Infrastructure: Leveraging infrastructure such as AI platforms and cloud technologies to provide scalable and flexible resources for AI development.

Talent and Skill

Talent and Skill dimension focuses on understanding the initiatives implemented by the selected countries within their education systems to develop skills, promote lifelong learning, and build a strong talent pool for AI.

- AI Education & Training Programs: Developing specialized education, educational curricula & training programs in AI to build a skilled workforce.
- Continuous learning and skill development: Encouraging lifelong learning and awareness initiatives to ensure that professionals remain updated with the latest AI advancements.

Impact of AI on Economy

Impact of AI on Economy dimension gives an insight on the levels of AI-Driven entrepreneurship, competitiveness, collaboration opportunities, and economic development within the AI domain in selected countries.

- AI-Driven entrepreneurship: Promoting AI-driven startups and AI-Driven entrepreneurship through funding, mentorship, and incubator programs.

- Public-private partnerships: Establishing collaborations between public institutions and private universities, research organizations and companies to accelerate AI development and deployment.
- International Collaborations: Engaging in international partnerships to exchange knowledge, technologies, and best practices in AI.
- Investment in AI: Encouraging investments in AI research, development, funding programs and commercialization to fuel economic growth.

The key learnings from the benchmarking analysis using the above aspects can provide the countries globally, including the DCO Member States with a detailed understanding of the world of AI adoption and implementation. These insights enable countries to evaluate their AI readiness, pinpoint gaps and opportunities, and adopt best practices more efficiently through targeted initiatives. Ultimately, this approach aims to promote the responsible and strategic adoption of AI technologies, empowering the countries to leverage AI for innovation, improve public services, and stimulate economic growth.

4. IDENTIFICATION OF GLOBAL AI LEADING COUNTRIES

To ensure the benchmarking analysis provides a well-rounded perspective, it is essential to include a diverse selection of countries that represent different stages of AI development, innovation and deployment. This approach allows for a more detailed understanding of how different countries are advancing in the AI domain, regardless of their starting points or current capabilities. By including global AI leaders from every region, the analysis can highlight best practices, innovative strategies, and effective policies that have been successful across different geographical and cultural landscapes.

Considering emerging countries that have demonstrated remarkable progress in AI adoption is equally important. These countries often face unique challenges, such as limited resources, varying levels of infrastructure, and different regulatory environments. Despite these obstacles, some countries have made significant strides in AI adoption and innovation. Analyzing their experiences can provide valuable insights into the strategies and solutions that have enabled their rapid advancement in AI. This approach ensures that the benchmarking process captures a wide range of key experiences, learnings, best practices and lessons, providing a rich foundation for developing tailored recommendations and strategies for AI readiness and adoption across different sectors.

To identify and benchmark countries that are leading 1) globally across 4 regions namely Americas, Europe, Asia Pacific, and Middle East & North Africa and 2) emerging in AI, a structured methodology is employed.

Initial Consideration: The benchmarking process began with the consideration of all countries worldwide, creating a master list for further evaluation.

1. Global AI Leading Countries: Countries that consistently rank high globally across multiple AI-related indices, recognized for their leadership in AI. Analysis will include a country from the following geographic regions:
   a. Americas (North, Central & South America)
   b. Europe (Western & Eastern Europe)
   c. Asia Pacific (South, East & Southeast Asia and Oceania)
   d. Middle East (ME) and North Africa (NA)

2. Emerging Countries: Country that have shown significant improvement in AI readiness and adoption and have grown in the Global AI Indices ranking in last few years.

Selection Criteria: The below criteria will help direct the aim towards the countries that are truly setting a benchmark globally and emerging in AI. These are derived from the key factors determined by answering the benchmarking questions and the implication of the AI readiness & adoption by the countries globally, including the DCO Member States.

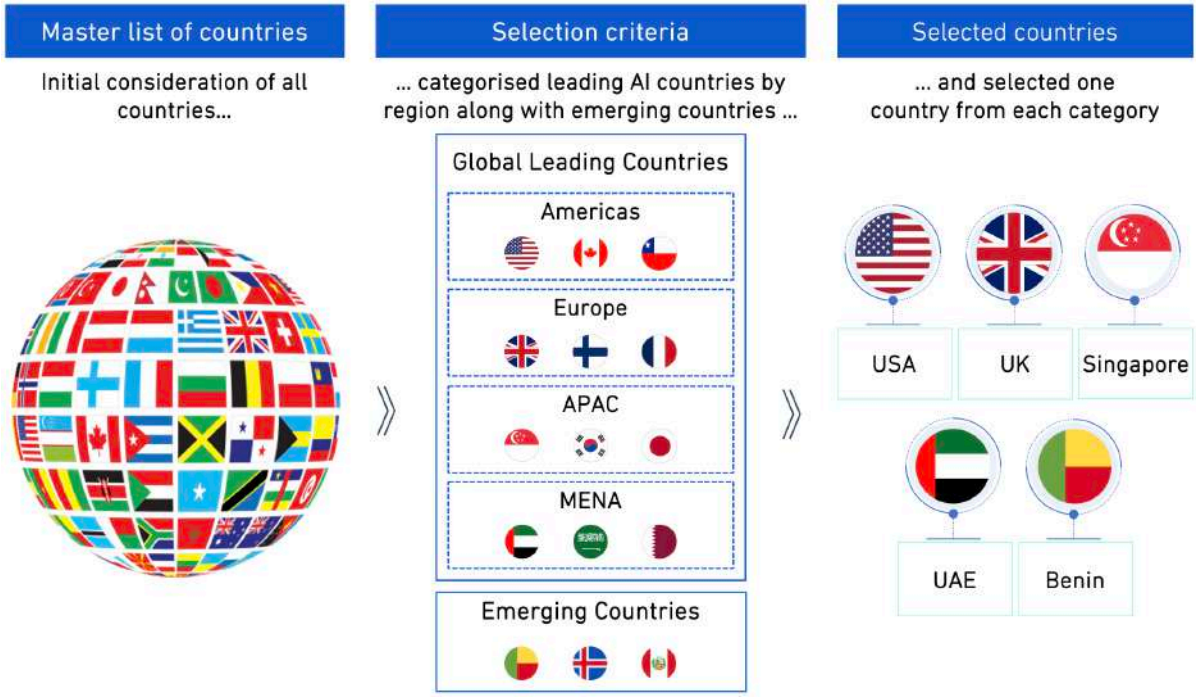


Figure 2: Selection criteria to finalize countries

The process of identifying these final Global AI leading and emerging countries involves analysing and selecting from reputable global AI indices, such as Tortoise Media and Oxford Insights. These rankings cover three critical aspects that are part of the selection aspects: government policies and strategies, the strength of the technology sector, and the emphasis on data and infrastructure.

Below is the methodology of selecting the AI leading countries and the application of the methodology that will be benchmarked using certain selection aspects following which secondary research of the finalized Global AI leading countries will help determine the best practices, initiatives and key learnings.

Following this thorough evaluation process, the final step was to select the five countries that would be the focus of the secondary benchmarking to identify the best practices from each country which can inspire the countries to adopt. These countries represent the best in AI readiness and adoption, and their practices and strategies will provide invaluable insights for the development of the AI Readiness Toolkit.

4.1 IDENTIFYING GLOBAL AI LEADING COUNTRIES

- Objective: Identify and compile a list of countries that consistently rank high across multiple AI-related global indices to highlight nations recognized globally for their leadership and maturity in AI, based on evaluation of their AI readiness and adoption.
- Methodology:
    - Identification of Indices: Data was gathered from various global AI indices such as Tortoise Media and Oxford Insights, which rank countries based on AI readiness, government policies, technology infrastructure, data management, and other relevant dimensions.

      The Government AI Readiness Index by Oxford Insights was considered as it is regarded as the most comprehensive tool for assessing government AI readiness on a global scale, covering over 190 countries. It evaluates around 40 different indicators and is widely utilized by policymakers, researchers, and organizations to measure a country's AI maturity and potential.

    - Ranking Matrix: A matrix was developed to cross-reference and analyse rankings across different sources. This approach helped in identifying countries that consistently perform well in AI-related domains.
    - Regional Coverage: One county was identified from each region (Americas, Europe, APAC, and MENA) to ensure that learnings from all the regions across the world are incorporated.
- Outcome: Based on the ranking, identified the top 4 countries, one from each region.

The following table provides an overview of the positions of leading countries as ranked by the Government AI Readiness Index by Oxford Insights.

By highlighting the top countries from each region—Americas, Europe, Asia-Pacific (APAC), and Middle East & North Africa (MENA)—the table enables a comparative analysis of AI readiness across diverse geopolitical landscapes. This regional focus helps to identify not only global leaders but also regional champions who have excelled in developing their AI strategies, policies, and infrastructure.

Country	Region	Global AI Ranking 2023*	Government AI Readiness Index*	Selected
United States of America	Americas	1	84.80	Yes
Singapore	APAC	2	81.97	Yes
United Kingdom	Europe	3	78.57	Yes
Finland	Europe	4	77.37	No
Canada	Americas	5	77.07	No
France	Europe	6	76.07	No
Republic of Korea	APAC	7	75.65	No
Germany	Europe	8	75.26	No
Japan	APAC	9	75.08	No
Netherlands	Europe	10	74.47	No
Denmark	Europe	11	73.91	No
Australia	APAC	12	73.89	No
Norway	Europe	13	72.71	No
Sweden	Europe	14	72.55	No
Austria	Europe	15	72.37	No
China	APAC	16	70.94	No
Estonia	Europe	17	70.86	No
United Arab Emirates	MENA	18	70.42	Yes
Taiwan	APAC	19	70.25	No
Ireland	Europe	20	69.82	No

Table 1: Global Ranking of Countries Leading in AI Domain *[1] Country [2]* (*as per Government AI Readiness Index by Oxford Insights)

Based on this approach, we have selected the United States of Americas from the Americas region, the United Kingdom from Europe region, Singapore from the Asia-Pacific (APAC) region, and the United Arab Emirates (UAE) from the Middle East and North Africa (MENA) region. These countries represent the top performers in AI-related domains within their respective regions, providing a solid perspective for benchmarking.

4.2 IDENTIFYING EMERGING COUNTRIES

- Objective: Identify countries that have shown significant growth in AI over the past 2-3 years, focusing on those emerging as potential leaders in AI.
- Method:
    - Reviewed AI Global Index rankings from 2021 to 2023 years to pinpoint countries that have demonstrated rapid growth in AI.
    - Analysed the AI growth trajectory of these identified countries, assessing their progress and development in the AI domain.
    - Sorted the countries based on their AI growth rank to determine which nations have made the most significant strides.
- Outcome: Identified the top country that have shown substantial progress and potential in AI, earning it the designation of top emerging country.

The following table presents an overview of the AI Global Index rankings from 2021 to 2023, highlighting countries that have shown significant growth in AI during this period. This data helps to identify nations that have made substantial progress in AI development and adoption, showcasing their commitment to advancing AI capabilities and infrastructure.

Country	Region	Global AI Ranking 2021 (A*)	Global AI Ranking 2022 (B*)	Global AI Ranking 2023 (C*)	Rise in Ranking (A*–C*)
Benin	Sub-Saharan Africa	145	108	97	48
Peru	Americas	91	61	58	33
Bangladesh	APAC	110	80	82	28
Rwanda	Sub-Saharan Africa	112	93	84	28
Iceland	Europe	46	45	21	25
Jordan	MENA	80	63	55	25
Pakistan	APAC	117	92	92	25
Dominican Republic	Americas	89	81	66	23

*Table 2: Selection of Emerging Country [2] (*as per Government AI Readiness Index by Oxford Insights)*

In 2023, Benin significantly improved its global ranking to 97th, marking a remarkable rise of 48 places since 2021 according to the AI Global Index. Due to this impressive growth, Benin has been selected for benchmarking to explore the strategies and initiatives that have contributed to its rapid advancement in AI.

Selected Global AI Leading & Emerging Countries

The selection of these five countries—1) four global leaders (USA, Singapore, UK and UAE) representing the Americas, Asia Pacific, and Europe, along with the Middle East and Africa region, and 2) Benin as an emerging AI leader—provides a diverse and strategic benchmark for the AI Readiness Toolkit. This carefully curated selection aims to provide a holistic coverage of countries across the world.

Figure 3: Highlighting countries selected for the benchmarking analysis

1) Global AI Leading Countries

These countries are recognized for their top-tier performance in AI readiness and adoption, consistently ranking high across multiple AI-related global indices:

United States of America: Selected from Americas Region. Ranked 1st globally, the USA leads in AI innovation, government policies, and infrastructure.

Singapore: Selected from Asia Pacific Region. Ranked 2nd globally, Singapore is known for its strong AI governance and strategic investments in technology.

United Kingdom: Selected from Europe Region. Ranked 3rd globally, the UK excels in AI research, development, and ethical AI practices.

United Arab Emirates: Selected from Middle East and Africa Region. Ranked 18th globally, the UAE is a key influencer in AI, with strong government initiatives and significant investments in AI technology and infrastructure.

2) Emerging Country

This category includes the country that show significant improvement and potential in AI adoption and readiness. They have been identified as rising stars in the AI sector:

Benin: Ranked 97th globally, Benin has made substantial progress in AI readiness due to its notable improvements in digital infrastructure, government commitment to AI, and efforts to develop its technology sector.

Assessment of these selected countries across the benchmarking aspects will help extract best practices, initiatives, and key learnings from global AI leading countries across various regions and levels of AI maturity. The inclusion of these countries ensures that the AI-REAL Toolkit is adaptable and informed by both top-tier and emerging AI practices.

5. BEST PRACTICES, KEY AI PILLARS & INITIATIVES

In the rapidly evolving field of AI, understanding the factors that contribute to a country's success in AI readiness and adoption is crucial. To achieve this, it is essential to closely examine the national AI strategies, policies, and related documents of countries recognized as global AI leading and emerging countries. By analysing these documents, best practices, key learnings, and innovative initiatives can be identified that have propelled these nations to the forefront of AI development.

Benchmarking analysis will be conducted across five key dimensions: government policies, data and infrastructure, technological advancement and readiness, the impact of AI on the economy, and talent & skills. This benchmarking analysis not only highlights the strategic approaches and governance models that drive AI success but also offers valuable insights that can be adapted and implemented by other countries aiming to enhance their AI capabilities. These dimensions were selected based on their critical role in shaping a robust AI ecosystem, supported by expert consultations and a comprehensive literature review of global AI indices and readiness frameworks.

The aim of this analysis is to distil actionable learnings that will inform the development of an AI Readiness Toolkit, tailored to support the strategic objectives of the DCO. Each selected country will be thoroughly analysed using the defined benchmarking aspect through literature review, alongside insights from subject matter experts. This approach ensures a comprehensive understanding of the strategic elements that contribute to AI leadership.

5.1 UNITED STATES OF AMERICA

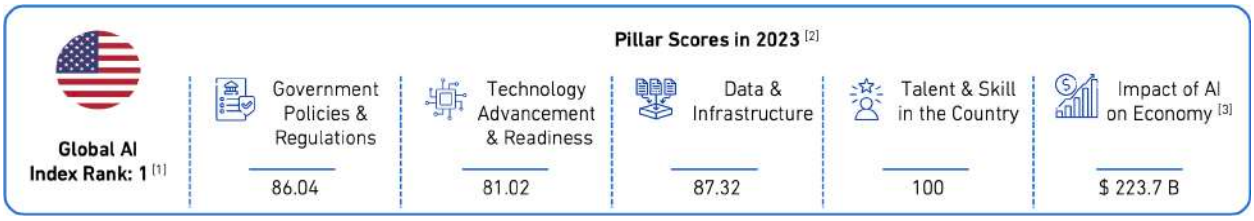


Figure 4 USA Benchmark [1] [2] [3]

The 2023 update to the National Artificial Intelligence (AI) Research and Development (R&D) Strategic Plan outlines the U.S. federal government's commitment to maintaining its leadership in AI through strategic research and development investments. This plan reaffirms eight strategies from previous plans and introduces a ninth, focusing on international collaboration in AI research. The strategies emphasize long-term investments in responsible AI research, foster human-AI collaboration, address ethical and public implications, ensure safety and security in AI, and develop open datasets. The goal is to advance trustworthy AI that aligns with American values, benefits the public good, and supports global leadership in AI.

1. Government Strategy, Policies & Regulations

AI Policies and Regulations

- The USA leads in AI through comprehensive policies like the National AI Initiative Act 2020, which established the National AI Initiatives Office (NAIIO) under the White House. It ensures comprehensive coordination across federal agencies regarding AI development, ethics, and regulation. [4]
- The USA also signed an Executive Order 13859, to promote federal investment in AI research and development, collaboration across public and private sectors, and ensures that AI advancements are ethically aligned with U.S. government values. [5]
- AI Regulation by the Federal Trade Commission to monitor and enforce rules around the use of AI, focusing on preventing consumer harms, ensuring transparency, and regulating the ethical use of AI. [6]

AI Governance & Ethics

- The USA follows principles-based administration for AI governance which focuses on flexibility and self-regulation. The National Science & Technology Council Select Committee on AI is tasked with coordinating efforts across federal agencies, setting priorities, and ensuring that AI R&D is aligned with national goals. [7]
- Agencies like the Federal Trade Commission and Equal Employment Opportunity Commission (EEOC) are involved in setting AI governance policies that focus on accountability in employment & consumer protection. [8]

		▪ The U.S. encourages self-regulation in AI-related professions, with private sector firms establishing ethics boards to oversee the responsible deployment of AI technologies. ▪ Department of Defence has developed ethical principles for AI, emphasizing fairness, accountability, reliability, and traceability in military AI technologies. ▪ The National Institute of Standards and Technology developed a framework for AI that outlines best practices for reducing bias and promoting ethical usage.
	Sustainable & Inclusive AI	▪ The White House Office has prepared blueprint for an AI Bill of Rights, which focuses on ensuring AI systems are developed and used in ways that protect civil rights, prevent algorithmic bias, & maintain transparency. It promotes fairness in the design and deployment of AI, ensuring that these technologies do not perpetuate discrimination or inequality. [9] ▪ Deploying AI in smart grid technologies to optimize energy usage and contribute to the sustainability goals. ▪ Tech giants like Google, Microsoft, and Amazon are at the forefront of developing green AI. These companies are working on reducing the carbon footprint of data centers through more efficient computing, leveraging AI to optimize energy use, and even investing in AI solutions that support the renewable energy transition.

2. Technology Advancements & Readiness

	AI Research and Development	▪ The U.S. government has significantly increased funding for AI research through the National AI Initiative Act of 2020, which prioritizes AI research in critical areas like ethical AI, cybersecurity, and AI's impact on public health and education. [10] ▪ The USA enables collaborations between government organizations, private industries, and the scholarly world to drive research and development in AI domain. Government financed activities, such as the CHIPS and Science Act, back semiconductor and microelectronics R&D for AI advancement. [11] ▪ The USA played a significant part in creating generative AI models like OpenAI GPT arrangement, with GPT-3 and GPT-4 being broadly utilized over businesses for creating human-like content. [12]

		▪ In addition to Open AI, there are several other companies leading in research and development in AI such as: o Google DeepMind that specializes in fortification learning and neural systems. o IBM Development (Watson AI) that centers on AI applications in healthcare and trade analytics. o Microsoft Research investing in machine learning, computer vision, and AI ethics.
	AI Deployment and Integration	▪ Through programs like AI in Government Act of 2020, the USA aims to integrate AI into federal agencies for enhanced decision-making, customer service, and operational efficiency. ▪ USA provides advanced computing assets, counting cloud computing and high-performance computing through federal initiatives. This helps to scale AI development and integration efficiently.
3. Data & Infrastructure		
	Data Availability	▪ Under the Federal Data Strategy, U.S. agencies are directed to make public data more accessible for AI research and development. The government promotes open data initiatives to ensure researchers and developers have access to high-quality datasets necessary for AI training and testing. [13]
	Data Management and Protection	▪ The USA has published playbooks, guidance, templated and many resources to support the implementation of data management in the federal government [14] ▪ AI Bill of Rights outlines principles for protecting individuals' privacy and preventing harmful AI use, particularly in data-sensitive applications. [9] ▪ U.S. prioritizes strong data governance to ensure data integrity and security throughout the AI lifecycle. Agencies are required to follow federal data management policies under the Federal Data Strategy, which includes secure data handling, sharing, and storage practices. [14]
	Data Quality	▪ The USA is making information more consumable by modernizing and managing open data, especially commerce data, to be AI-ready. AI-ready data means data that is not just machine-readable, but machine-understandable; data that is enriched with contextual

		metadata and organized in interpretable standard formats. [13] ▪ USA has notable data quality initiatives such as: o Data Quality Campaign (DQC) - Focused on ensuring that data benefits individuals, families, and educators, the initiative promotes the effective use of educational and workforce data. It supports policies that advance the utilization of education data to facilitate informed decision-making. [15] o Workforce Information Quality Activity (WDQI) - This initiative from the U.S. Department of Labor supports states in improving the collection and analysis of workforce data. It helps establish longitudinal databases that link education and workforce data, enabling better program evaluations and informed decision-making regarding education and employment outcomes. [16] o CDC's Information Modernization Activity (DMI) - The initiative aims to improve public health data infrastructure by enhancing data sharing and analysis for real-time decision-making during health crises. It focuses on modernizing data collection across public health systems to respond more effectively to emergencies & disease outbreaks. [17]
	Infrastructure	▪ The USA initiated the National AI Research Resource (NAIRR) pilot, a concept for a national infrastructure, seeks to make available the needed computational data, software, training, and educational resources required to fuel AI research and discovery. [18]

4. Impact of AI on Economy

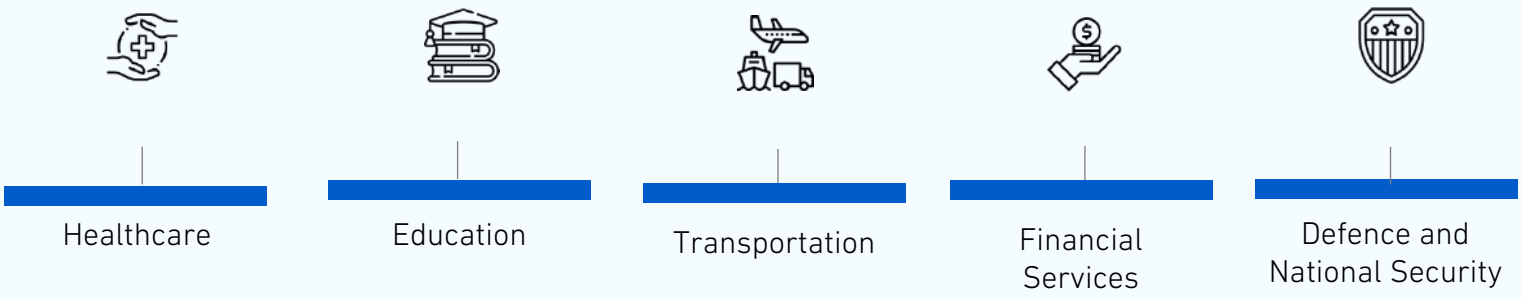
	Investments in AI	▪ The U.S. government has significantly increased public investment in AI through agencies such as the National Science Foundation, which launched AI Research Institutes focusing on areas like healthcare, agriculture, and education. [19] ▪ Private sector investment has also surged, with the U.S. leading global AI venture capital funding. Companies invest in AI to automate processes, optimize supply chains, and enhance customer experience, driving productivity across industries. ▪ The U.S. government continues to invest heavily in foundational AI research. This includes areas like

		learning, reasoning, and computer vision, with funding from agencies like the Department of Energy (DoE) Office of Science. [20]
	International Collaboration	▪ The USA actively collaborates with global partners on AI through initiatives like the OECD AI Policy Observatory, G7 AI Initiatives, working with the European Union and other nations on cross-border collaboration
	Economic Growth Contribution	▪ AI inquire about is anticipated to contribute essentially to worldwide financial development. It is anticipated that AI might contribute as much as $11.5 trillion in aggregate development over G20 nations by 2030. [20]

5. Talent and Skill

	AI Education and Training Programs	▪ Integrating AI education across all levels, from K-12 to higher education, aiming to build a robust talent pipeline. [20] ▪ As part of the National AI Initiative Act of 2020, the USA is investing in educational programs that develop AI-related skills. This includes collaborations with universities and AI research institutes to integrate AI training into academic curricula, aiming to prepare students for AI-focused careers. [21]
	Continuous Learning and Skill Development	▪ Continuous education and skill development in AI ensuring that the workforce remains adaptable and capable of leveraging AI advancements. ▪ To support workers in adapting to the AI-driven economy, the USA promotes reskilling initiatives that focus on AI and digital skills. Programs like Apprenticeship.gov provide AI-focused apprenticeships, helping workers learn AI-related skills while on the job.

Focus Sectors [20]



Based on the literature review and inputs from the experts, USA AI focus sectors include healthcare, financial services, manufacturing, defence, transportation and national security. USA is well-placed to support its key AI pillars: the strategic vision for AI policies, governance, and ethics; driving innovation, research, development, and deployment. It lays emphasis on the availability of data, its management, and protection, together with infrastructure. There is also heavy emphasis on AI education, training programs, and skill development that promote AI-Driven entrepreneurship through public-private partnership investment with a view to ensure proper integration of AI in these sectors.

AI Pillars

1	Strategic vision, AI policies, governance, and ethics
2	Innovation, research, development, and deployment
3	Data availability, management & protection, and infrastructure
4	AI education & training programs, and skill development
5	Entrepreneurship, public-private partnerships, and investment

Key Developments in AI Domain:

1. Artificial Intelligence Research and Development (R&D) Investments:
    - Increased funding for AI development across government agencies.
    - Enhanced investments in AI-related infrastructure and resources.
2. AI Infrastructure Development:
    - Developed and implemented advanced AI infrastructure to support large-scale AI development and deployment.
    - Aims to expand AI computational resources and data access for researchers.
3. AI Workforce Development:
    - Invested in AI education and training programs to build a skilled AI workforce.
    - Collaborates with academia and industry to develop AI curricula and create job opportunities.
4. Ethics and Safety in AI:
    - Strengthened efforts to ensure the ethical development and deployment of AI.
    - Established guidelines and regulations to address security and fairness in AI systems.
5. AI Applications and Innovation
    - Promotes the use of AI in critical sectors such as healthcare, security, and public services.
    - Supports the development and commercialization of AI technologies through partnerships and funding programs. [20]
6. Bureau of Information Resource Management (IRM)
    - Leverage AI to enhance data management and technology strategies across the department, optimizing decision-making & operational efficiency [22] [23]
7. NorthStar
    - The Bureau of Global Public Affairs utilizes NorthStar, a cutting-edge AI-powered tool for digital and social media analytics. It enhances the ability to search, translate, and summarize media content while offering insights into its social media presence globally [24] [22]
8. Global Engagement Centre
    - Focuses on identifying, testing, and implementing technologies to counter propaganda and disinformation. It collaborates with global partners, private industry, and academia to address growing threat of misinformation [22] [25].
9. Technology Engagement Team (TET)
    - The Office of the Beneath Secretary for Administration utilizes AI innovations to upgrade conventional political exercises, applying machine learning to optimize inner IT and administration consultancy errands [22] [26].
10. Office of Management Strategy and Solutions (M/SS)
    - Supports the application of AI to streamline and optimize operations [22] [27].

11. Office of the Under Secretary for Economic Growth, Energy, and the Environment
    - This office plays a crucial part in cultivating universal collaborations in AI inquire about and advancement, pushing for U.S. interface, and setting up even-handed worldwide measures for financial competition in AI Bolsters the application of AI to streamline and optimize departmental operations [22] [27].
12. Office of the Under Secretary of State for Arms Control and International Security
    - Play a key role in fostering global collaborations in AI R&D, advocating for U.S. interests, and promoting equitable international standards to ensure competitive advantages in AI [22]
13. Office of the Under Secretary for Civilian Security, Democracy, and Human Rights
    - Concentrates on AI-related administration issues, human rights, opportunity, and law requirement challenges.
14. Office of the Legal Adviser
    - Leads discussions on AI in weapon systems, particularly focusing on Lethal Autonomous Weapons Systems (LAWS) to address the ethical, legal, and security implications of autonomous weapons, aiming to regulate their use in warfare [22] [28].
15. U.S. government has significantly increased its investment in AI research and development, allocating over $2 billion to non-defence AI programs in the fiscal year 2023. [29] This funding is aimed at advancing critical areas such as AI ethics, healthcare, and security, ensuring the U.S. remains at the forefront of AI innovation. By focusing on these key areas, the U.S. seeks to maintain its leadership in AI while addressing important societal and ethical challenges associated with its deployment.

5.2 SINGAPORE

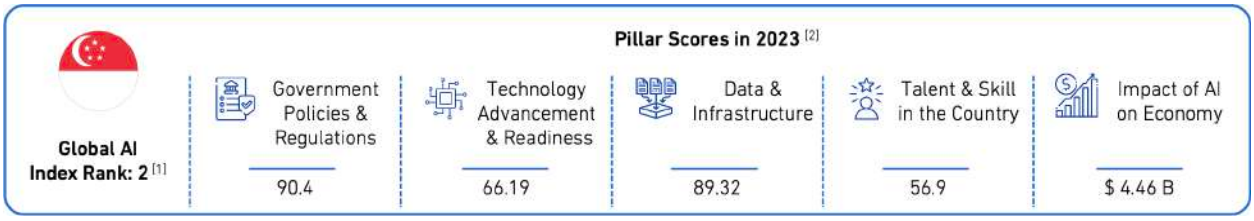


Figure 5 Singapore Benchmark [1] [2]

Singapore's AI strategy, launched in 2019 and updated in 2023, focuses on transforming the city-state into a global hub for AI innovation and adoption. It emphasizes fostering research and development, driving AI adoption across various sectors, and developing a skilled workforce.

The strategy also aims to create a robust AI ecosystem by encouraging public-private partnerships, ensuring ethical AI use, and enhancing digital infrastructure. Additionally, Singapore seeks to leverage AI to improve public services, boost economic growth, and address key public challenges.

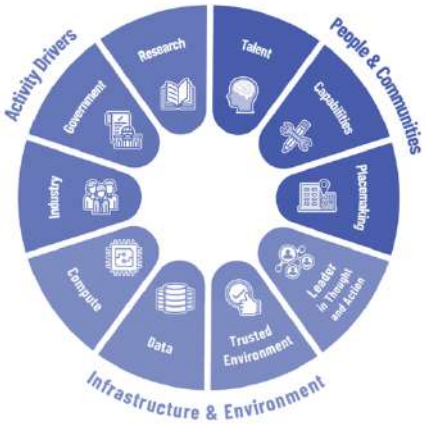


Figure 6 Singapore System Activities [30]

1. Government Strategy, Policies & Regulations

AI Policies and Regulations

- Singapore developed National AI Strategy in 2019 and refreshed it in 2023. [30] [31]. National AI Strategy 2.0 outlines its vision to integrate AI across key sectors such as healthcare, transport, and smart cities by 2030. The strategy focuses on building a robust AI ecosystem, which includes funding R&D, fostering talent, and creating a regulatory environment for AI.

AI Governance & Ethics

- Singapore follows principles-based administration for AI governance which focuses on flexibility. It launched the world's first Model AI Governance Framework in 2019. In 2022, Singapore also launched AI Verify, an AI governance testing framework and software toolkit, and made it open source for developers in June 2023. [30]
- Singapore developed an AI governance testing framework and software toolkit developed consists of 11 AI ethics principles which are consistent with internationally recognized global frameworks.
- AI Verify helps organizations validate the performance of their AI systems against these principles through standardized tests. [30]

Sustainable & Inclusive AI	▪ Singapore is reducing the environmental impact of AI technologies by promoting "Green AI", especially by optimizing energy usage required to drive AI related infrastructures such as data centers. ▪ Singapore Energy Market Authority (EMA) utilizes AI to optimize the energy grid, helping to integrate renewable energy sources like solar power into the national grid and reduce the country's reliance on fossil fuels. ▪ SkillsFuture Singapore program integrates AI to help students and workers identify skill gaps and receive personalized recommendations for upskilling opportunities, ensuring that everyone, regardless of socio-economic status, has access to education ▪ AI-driven Social Services Navigator is an initiative designed to connect vulnerable populations, such as low-income families and people with disabilities, to relevant government services and welfare programs, ensuring that they receive the support they need. [73][74][75][76]

2. Technology Advancements & Readiness

Innovation	▪ Focuses on AI innovation and adoption in sectors like manufacturing, financial services, transport & logistics, and biomedical sciences. ▪ AI Centre of Excellence (CoEs): Established sectoral AI CoEs to drive AI value creation in key economic sectors and attract global talent. ▪ Strengthening the AI start-up ecosystem by attracting AI-focused accelerator programs to spur rapid AI experimentation.
AI Deployment and Integration	▪ Improved public service productivity by integrating AI into government functions and developing AI sector-specific strategies in areas like healthcare & education. ▪ Working with the best-in-class to provide an innovation sandbox for AI development. ▪ Singapore is selectively unlocking more public sector data for AI development that serves the public good. ▪ Advocating for trusted cross-border data flows and providing guidelines to businesses to educate and facilitate greater data use, to continue their thought leadership around the use of data for AI development.

3. Data & Infrastructure

Data Availability

- Unlocking more government datasets for AI development, potentially establishing a "data concierge" to facilitate the availability of data. [30]
- The open-source movement has made large quantities of data available, while private sector data marketplaces also facilitate the commercial trading of datasets. Meanwhile, it has become easier to create and augment structured datasets, including using synthetic data. [32]

Data Management and Protection

- Developed capabilities like synthetic data generation, federated learning, and encryption for safe data sharing.
- The Government will support research and development for Privacy Enhancing Technologies (PETs), especially in targeted areas like synthetic data generation, data annotation, federated learning, and homomorphic encryption, and expand practical measures like regulatory sandboxes and guidelines to promote experimentation with PETs. [30]

Data Quality

- Securing access to high-performance computing resources and developing sustainable data centres powered by renewable energy.

Infrastructure

- Singapore has invested in the National Supercomputing Centre to provide the computational resources needed for AI research. It supports large-scale AI projects by offering high-performance computing capabilities, which are essential for training advanced AI models.
- AI Singapore developed SEA-LION, a family of LLMs that is specifically pre-trained and instruct-tuned for Southeast Asian languages and cultures. It also serves as the foundation for Singapore's National Multimodal LLM Program.

4. Impact of AI on Economy

Investments in AI

- Targeting AI adoption in key sectors - Manufacturing, Financial Services, Transport & Logistics, and Biomedical Sciences, to drive economic transformation.
- Singapore has committed more than S$500 million through AI Singapore (AISG) under the Research, Innovation and Enterprise (RIE) 2020 and 2025 plans [30]

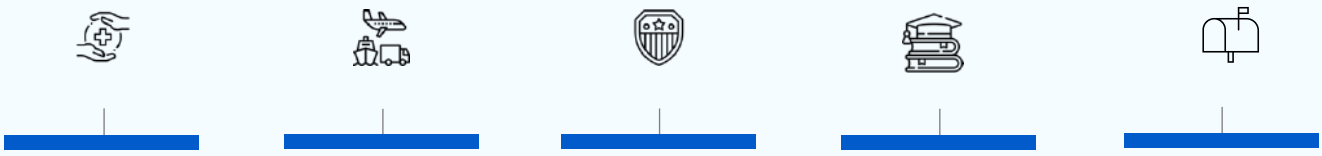
 International Collaboration	▪ Singapore actively engages in global AI governance discussions to promote responsible AI practices and collaborates with universities, and research institutions to foster AI research and provide practical experience through internships and collaborative projects. ▪ The country aims to expand international research collaborations in areas aligned with its research priorities, such as through joint grant calls, PhD training programs, and participation in relevant international conferences. ▪ This approach helps Singapore enhance its AI capabilities by partnering with leading experts worldwide and contributing to global AI development. ▪ Singapore participates actively in multi-stakeholder platforms, including the Global Partnership on AI (GPAI), the World Economic Forum (WEF) AI Governance Alliance, and the UN High-Level Advisory Body on AI. [30]
 AI-Driven entrepreneurship	▪ Leveraging AI to optimize business functions across various domains such as customer relationship management, finance, and supply chain management.
 Public-Private Partnerships	▪ In concert with private sector partners, Singapore is strengthening the AI start-up ecosystem by attracting more venture builders and developing more accelerator programmes. It is working with industry and public research partners to organise more AI-related events, and increase the cadence of AI community networking events like the ongoing Neural Networking series [30]

5. Talent and Skill

 AI Education and Training Programs	▪ Development of specialized AI courses and training programs at various levels of education, from primary to higher education, aimed to build strong AI talent pipeline. ▪ Government agencies equipped with the specialized knowledge, technical capabilities, and regulatory tools are developing and leading sector-specific AI strategies, to address their needs and challenges. ▪ Singapore is re-designing the AI Apprenticeship Program (AIAP) to significantly increase the number of apprentices they can train annually. They will also work with industry AI product development teams to expand

		the number of company attachments for their Continuing Education and Training programs [30]
	Continuous Learning and Skill Development	▪ Initiatives to reskill and upskill the current workforce to meet the demands of AI-driven industries, including professional development and continuing education programs. Moreover, aiming to boost the AI practitioner pool to 15,000 by scaling up AI-specific training programs and continuing education efforts. [30] ▪ Scaling up technology and AI talent pipelines, through Pre-Employment Training and by reskilling/upskilling workers through Continuing Education and Training.

Focus Sectors [30]



Singapore's National AI Strategy 2.0 aims to harness AI for the public good by focusing on key sectors. In healthcare, AI is used in chronic health management and medical diagnostics. In education, AI-driven adaptive learning systems enhance personalized learning. Financial services leverage AI for fraud detection and risk management.

In manufacturing and transport & logistics, AI optimizes operations and supply chain management. Across sectors, Singapore emphasizes responsible AI development, focusing on Reasoning AI, Resource-Efficient AI, and Responsible AI to ensure ethical and sustainable AI deployment.

AI Pillars

1	Strategic vision, AI policies, governance, and ethics
2	Innovation, research, development, and deployment
3	Data availability, quality, infrastructure for AI
4	AI education and skill development
5	Using AI to uplift human potential and address social challenges
6	AI-Driven entrepreneurship and economic growth through AI
7	Investing in AI for business operations, sciences and foundational technologies
8	Building robust AI infrastructure and fostering a trusted environment

Key Developments in AI Domain:

1. AI Governance Ethics
    - Continue to strengthen AI governance and ethical frameworks to ensure responsible AI development and deployment.
    - Develop new guidelines and best practices for AI systems to ensure they align with public values [30]

2. AI for Public Sector Transformation
    - Accelerate the adoption of AI in the public sector to improve service delivery and operational efficiency.
    - Implement AI-driven initiatives in areas[30].
3. LearnAI
    - Develop self-directed learning resources for students and working professionals.
    - Create a suite of programs to get students and professionals that help accelerate their AI learning journey.
    - AI for Everyone and AI for Industry programs, designed to build foundational AI skills and knowledge.

4. AI Innovation
    - AI adoption in industry through talent and projects.
    - Focuses on talent development to enhance Singapore's AI capabilities.
5. AI Products
    - Develop and distribute open-source AI tools and frameworks, such as NLP models and AI governance frameworks, to accelerate AI adoption and innovation.
6. AI Research
    - Focuses on advancing AI knowledge by funding and supporting research in AI algorithms, techniques, and models.
    - Build strategic capabilities.
    - Retain and nurture local scientific talents [33].

5.3 UNITED KINGDOM

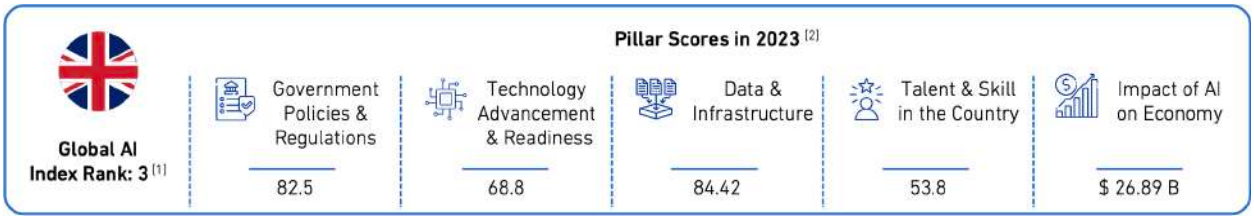


Figure 7 UK Benchmark [1] [2]

The UK's 2021 AI National Strategy focuses on positioning the UK as a global leader in AI by driving innovation, enhancing skills, and fostering collaboration. Strategy key elements include investing in AI research and development, improving data and digital infrastructure, and supporting AI talent through education and training. The strategy also emphasizes ethical AI use, aiming to ensure that AI technologies are developed and applied in a way that is safe, fair, and transparent.

1. Government Strategy, Policies & Regulations

AI Policies and Regulations	▪ National AI Strategy sets out the UK's 10-year plan to become a global leader in AI. The strategy focuses on promoting AI innovation, improving skills, and attracting global talent, while also ensuring ethical AI use. Key components include investments in AI research and innovation, nurturing AI talent, and creating regulatory environments that encourage AI adoption. [34] ▪ The UK is taking a pro-innovation approach to AI regulation by designing flexible frameworks that adapt to technological advances. Through initiatives like the AI Council and the Office for Artificial Intelligence, the UK aims to ensure that AI development is aligned with national priorities while remaining competitive. [35]
AI Governance & Ethics	▪ UK uses prescriptive frameworks to ensure AI governance enforceability. In collaboration with The Alan Turing Institute, the UK established the AI Standards Hub to support the development of global AI standards. This hub facilitates collaboration between businesses, academia, and policymakers, ensuring that AI technologies meet ethical and safety standards while supporting innovation. [36] ▪ The UK tailored its AI governance to specific sectors like healthcare, finance, and defence. For example, the MHRA (Medicines and Healthcare products Regulatory Agency) plays a key role in the governance of AI in

		healthcare, ensuring that AI systems used in medical devices and diagnostics meet high safety standards. [37] ▪ The Centre for Data Ethics and Innovation provides expertise on ethical AI issues, advising the UK government on responsible AI use. [38]
	Sustainable & Inclusive AI	▪ Launched AI for Decarbonization Program, investing £1 million to support AI innovation that addresses climate change and supports the UK's Net Zero goals. ▪ The UK has developed various ethical frameworks, such as the AI Public-Private Forum initiated by the Bank of England and the Financial Conduct Authority, which explores AI ethics in financial services. These frameworks focus on ensuring that AI systems do not perpetuate biases & are aligned with human rights. [39][77][78]
2. Technology Advancements & Readiness		
	AI Research and Development	▪ Through initiatives aligned with the National AI Strategy and partnerships with institutions such as the Alan Turing Institute, the UK is funding cutting-edge AI research in areas like autonomous systems, healthcare, and natural language processing. [36] ▪ The UK government, through UK Research and Innovation and programs like the AI Industrial Strategy Challenge Fund, continues to provide grants and support to accelerate AI innovations and maintain a strong focus on ethical AI development. [40]
	AI Development and Integration	▪ Created AI tech hubs, such as the National Health Services AI Lab, that supports the development of AI solutions for diagnostics and public services. [41] ▪ UK fosters industry-academic partnerships with leading tech companies like Google and DeepMind to promote the commercialization and real-world application of AI technologies. These efforts ensure that AI research is not only innovative but also effectively integrated into industries to enhance productivity & service delivery.

3. Data & Infrastructure

Data Availability

- The UK has been a leader in open data through initiatives like the Open Government Data Portal. Public sector datasets, ranging from transportation to healthcare, are made available for use in AI development. These efforts increase transparency, drive innovation, and empower AI researchers to build models using diverse datasets.

Data Management and Protection

- UK has implemented strong data protection laws under the Data Protection Act 2018. These regulations ensure that personal data used by AI systems is handled with the highest levels of privacy and security. AI technologies in the UK are required to comply with data protection principles such as data minimization, purpose limitation, and accountability. [42]
- The UK's Information Commissioner's Office has issued specific guidance for the use of personal data in AI systems. This includes recommendations on managing bias, ensuring transparency in AI decision-making, and protecting individuals from algorithmic discrimination. These guidelines align with broader data protection laws to foster trust in AI systems.

Data Quality

- The UK AI Roadmap emphasizes the importance of data quality for AI development. To ensure AI systems make accurate and fair decisions, the UK is working on improving the quality of data used in AI models.
- The UK promotes the development of data standards and encourages interoperability across systems.

Infrastructure

- The U.K. government has revealed details on its new £225 million ($272 million) AI supercomputer – with hardware from Nvidia and HPE set to power the country's fastest supercomputer. [43]
- UK national supercomputing service – ARCHER2 – is developing a computer code which can be integrated with AI to help address air pollution and carbon storage. [44]
- The AI for Services platform helps connect businesses in legal, accounting, insurance, and finance sectors with AI technologies and innovators. By building platforms like these, the UK is fostering AI use in diverse sectors and making it easier for organizations to adopt AI.

4. Impact of AI on Economy

Investments in AI

- AI is recognized as a driver of economic growth with a potential to boost productivity, create new job opportunities, and enhance existing industries.
- This initiative involves 18 universities working with partners to deliver these courses across 28 institutions in England. [45]
- Since 2014, the UK government has invested over £2.3 billion in Artificial Intelligence (AI) initiatives across various sectors. Key investments include:
  - £250 million to develop the NHS AI Lab at NHSX, accelerating AI adoption in healthcare.
  - £250 million for Connected and Autonomous Mobility (CAM) technology via the Centre for Connected and Autonomous Vehicles (CCAV).
  - £100 million to create 16 AI Centres for Doctoral Training, producing 1,000 new PhDs over five years.
  - Industry-funded AI Masters and 2,500 AI/data science conversion courses, including 1,000 government-funded scholarships.
  - Over £46 million to support Turing AI Fellowships via The Alan Turing Institute, promoting top AI talent.
  - £372 million for UK AI companies through the British Business Bank to grow the sector.
  - £172 million invested in the Hartree National Centre for Digital Innovation, with £38 million in private investment for High Performance Computing [34].

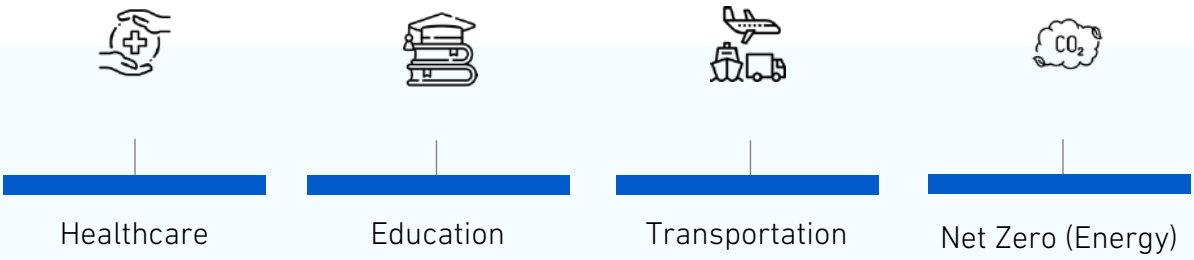
Public-Private Partnerships

- Key sectors where AI is expected to have a significant impact include healthcare, manufacturing, and financial services. The strategy aims to leverage AI to improve efficiency and innovation in these areas.
- The UK has focused on upskilling and reskilling its workforce in AI. This includes AI literacy programs, specialized training, and partnerships between academia and industry aimed at developing a strong talent pool capable of driving AI-driven growth.
- UK Defence has a strong record of collaboration with international partners and allies. Key collaborations include engagement with NATO allies to lead AI integration and interoperability across the Alliance, and supporting the AI Partnership for Defence, a 14-nation coalition providing global leadership for defence AI. [46]

5. Talent and Skill

AI Education and Training Programs	▪ Building a skilled through educational initiatives and training programs that cater to the growing needs of AI. ▪ The UK government is investing £17 million to attract diverse talent into digital and tech roles by funding AI and data science conversion courses. Around 2,500 places will be offered, including 1,000 scholarships aimed at underrepresented groups. [47]
Continuous Learning and Skill Development	▪ Fostering a conducive environment for professional growth, including international collaborations and ongoing skill development opportunities to attract top AI talents.

Focus Sectors [34]



In the National AI Strategy, the key AI pillars include Data, focusing on improving data availability, quality, and infrastructure to support AI innovation. Talent and Skills are emphasized to develop a diverse AI workforce through education and attracting global talent. Compute Infrastructure is crucial for enabling high-performance computing capabilities needed for AI research and deployment. Governance and Ethics aim to create a pro-innovation regulatory framework that ensures AI development is safe, ethical, and aligned with public values. Additionally, Research and Innovation are highlighted to foster cutting-edge AI technologies and their commercialization for broader public and economic benefits.

The Net Zero (Energy) sector focuses on leveraging AI to support sustainable energy practices and reduce carbon emissions, helping achieve climate goals. In Health and Social Care, AI is expected to improve diagnostics, patient care, and healthcare system efficiency, with investments like the NHS AI Lab driving innovation. The Defence and Security sector will benefit from AI advancements to modernize defence systems, enhance national security, and ensure strategic technological leadership.

AI Pillars

1	Strategic vision, AI policies, governance, ethics
2	Innovation, research, development, deployment
3	Data availability, quality, infrastructure for AI
4	AI education and skill development
5	AI-driven entrepreneurship and economic growth AI
6	Focus on solar energy and developing ultra-low power AI technologies [71] [72]

Key Developments in AI Domain:

The strategy outlines a 10-year plan for AI development, aiming for significant milestones to be reached by 2031.

1. Investing in the Long-term Needs of the AI Ecosystem
    - Increased investment in AI research and development, with a focus on foundational technologies.
    - Supports the development of AI infrastructure, such as computing power and data resources, to bolster the AI ecosystem.
    - Enhanced AI education and skills development to create a pipeline of talent for the AI sector.
2. Ensuring AI Benefits All Sectors and Regions
    - Promotes the adoption of AI across various sectors, including healthcare, finance, and manufacturing.
    - Encourages the use of AI in regions outside of traditional tech hubs to ensure nationwide growth.
    - Supports SMEs (Small and Medium Enterprises) in adopting AI technologies through funding and resources.

3. Governing AI Effectively
    - Developed a pro-innovation regulatory framework that balances innovation with safety and ethical considerations.
    - Established new guidelines and standards for AI to ensure transparency, accountability, and fairness.
    - Engaged with international partners to shape global AI governance frameworks and standards.
4. International Collaboration
    - Strengthened international partnerships in AI research and development.
    - Works with global organizations to address shared AI challenges and opportunities.
    - Leads in the development of global AI standards and regulations [34].
5. Skills and Diversity
    - Promotes AI education and training.
    - Encourages diversity in the AI workforce.
6. Data and Infrastructure
    - Develops a national data strategy.
    - Enhances data access and sharing frameworks.
7. Research and Development
    - Increases investment in AI R&D.
    - Focuses on ethical AI and innovation.
8. Talent
    - Promotes AI education and training.
    - Encourages diversity in the AI workforce
9. Public Trust
    - Establishes ethical standards for AI
    - Engages the public in AI governance discussions [48] [49].
10. Responsible AI UK (RAi UK) - is dedicated to advancing the responsible development and application of artificial intelligence, ensuring it benefits society while minimizing potential harms. Through various research projects, RAi UK aims to establish the UK as a global leader in ethical AI, shaping both policy and practice in this rapidly evolving field. Research projects include:
    a. Impact Accelerator Projects: These projects aim to transform responsible AI research into real-world applications, addressing pressing public issues. By focusing on practical outcomes, these initiatives have a direct and tangible impact on various sectors within the UK.
    b. Satellite Projects: Smaller, innovative projects that support and complement the larger initiatives, often exploring new ideas and technologies that can lead to significant advancements in responsible AI [50].

5.4 UNITED ARAB EMIRATES

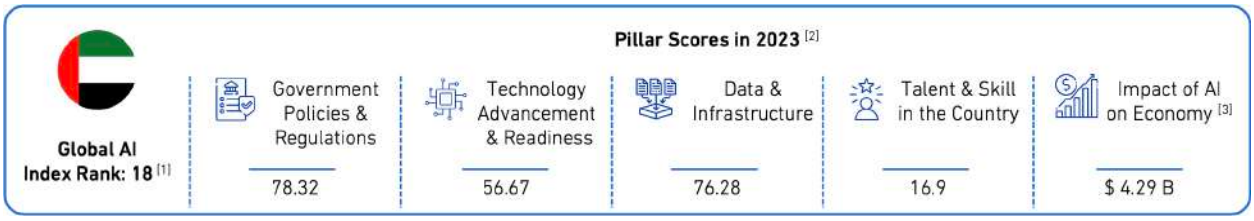


Figure 8 UAE Benchmark [1] [2] [3]

The UAE's AI strategy, launched in 2017 and updated in 2021, aims to position the UAE as a global leader in artificial intelligence by integrating AI into various sectors and enhancing the country's digital economy. The strategy focuses on fostering innovation, supporting AI research and development, and developing a skilled workforce. It also emphasizes the importance of AI in improving government services, boosting economic growth, and addressing public challenges. The UAE seeks to create a thriving AI ecosystem through strategic partnerships, investment in technology, and implementation of AI-driven solutions.

1. Government Strategy, Policies & Regulations

AI Policies and Regulations	▪ National AI Strategy 2031 aims to make the UAE a global leader in AI. This strategy includes developing comprehensive AI policies and regulations across industries such as healthcare, education, energy, and government services. ▪ The UAE is in the process of establishing AI certification programs that ensure AI systems adhere to international and local standards. ▪ The UAE has created regulatory frameworks that foster AI innovation while addressing risks. These frameworks are designed to be adaptable and flexible, enabling AI technologies to be tested and deployed within controlled environments before being rolled out more broadly.
AI Governance & Ethics	▪ The UAE was the first country in the world to appoint a Minister of State for Artificial Intelligence, whose role is to oversee the AI strategy, coordinate with government bodies, and develop necessary governance frameworks. ▪ The UAE established the UAE Artificial Intelligence and Blockchain Council to govern AI adoption and ensure alignment with global standards. UAE is also engaging stakeholders on this crucial topic of AI governance.
Sustainable & Inclusive AI	▪ AI is integrated into the UAE's Net Zero 2050 plan, with applications like AI-driven smart grids and renewable energy management to reduce carbon emissions and optimize resource efficiency. It also includes initiatives

		that promote inclusive access to AI-driven public services. ▪ AI is used in the Mohammed bin Rashid Al Maktoum Solar Park to optimize solar energy production, making the UAE a global leader in integrating AI into renewable energy solutions. ▪ A self-assessment tool is built to enable AI developer organisations or AI operator organisations to evaluate the ethics level of an AI system. [79][80]
2. Technology Advancements & Readiness		
	AI Research and Development	▪ The UAE supports innovation through initiatives like the Mohammed bin Rashid Innovation Fund and the National AI Challenges. These programs promote AI development across sectors like healthcare, logistics, and energy [51]. ▪ UAE Artificial Intelligence Lab plays a critical role in driving innovation by providing a space where developers, researchers, and businesses can collaborate on cutting-edge AI projects.
	AI Development and Integration	▪ The UAE has focused on integrating AI into government services. Projects like Smart Dubai and Dubai's Artificial Intelligence Lab are designed to make government operations more efficient through AI. This includes integrating AI for public service delivery, smart city initiatives, and digital governance.
3. Data & Infrastructure		
	Data Availability	▪ The UAE is developing a National Data Strategy to ensure that data is a critical asset for the economy. This strategy focuses on making data easily accessible to both public and private entities while balancing the need for security and privacy. ▪ The UAE promotes open data initiatives, particularly through the Open Data Portal, which provides access to government data across various sectors like healthcare, transportation, and education.
	Data Management and Protection	▪ The UAE has enacted the Personal Data Protection Law, which governs the collection, processing, and storage of personal data. This law is important for AI systems that rely on large volumes of personal and sensitive data.

Data Quality	▪ The UAE emphasizes the importance of data standards and interoperability to ensure that data used in AI systems is accurate, consistent, and fit for purpose. ▪ To enhance the quality of data for AI, the UAE is promoting data labelling and annotation programs, particularly for critical sectors like healthcare, finance, and transportation. This will ensure that datasets used to train AI models are structured, accurate, and free from bias, improving the performance of AI systems.
Infrastructure	▪ The UAE is a leader in the development of smart cities, which rely on AI to manage everything from traffic control to energy consumption. This smart infrastructure serves as a foundation for integrating AI-driven systems into everyday life. ▪ The UAE has invested heavily in AI infrastructure, including high-performance computing (HPC) and cloud platforms that support AI research and development.

4. Impact of AI on Economy

Investments in AI	▪ UAE has committed significant investments, projecting AED 335 billion in AI-driven growth by 2030. [52] ▪ The UAE has launched several AI-focused investment funds, such as the Mohammed Bin Rashid Innovation Fund, to provide financial support to AI startups. This fund encourages the development of AI solutions.
Public Private Partnerships	▪ The UAE is aiming to host key international conferences and forums on AI making it a hub for global experts and entrepreneurs. With this, the UAE will become the centre of AI startups in the region. ▪ The UAE has formed public-private partnerships with global tech companies such as Microsoft, Google, IBM, and Amazon. These collaborations focus on leveraging AI technologies to drive innovation in focus sectors.
International Collaborations	▪ The UAE is a key player in international AI collaboration, hosting forums and working with organizations like UNESCO and OECD on AI governance. ▪ The UAE actively participates in international AI governance forums, including the United Nations, the World Health Organisation, the OECD, and the Global AI Ethics Consortium.

5. Talent and Skill

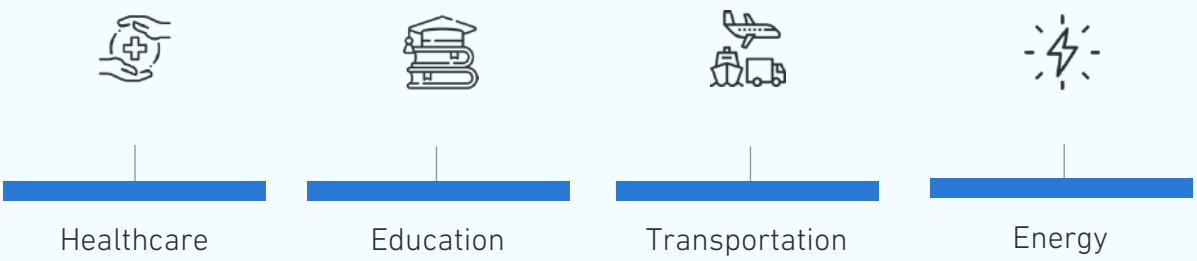
AI Education and Training Programs

- The establishment of Mohamed bin Zayed University of Artificial Intelligence, the first graduate-level AI university, signifies a major investment in AI talent.
- UAE is developing a UAI brand and will use this to attract talent and business from across the globe to come to the UAE to test and develop AI. The UAI will consist of four levels of approval to include Public Sector Level, Private Sector Level, Institutional Level, and Product Level.
- The certification system is based on the highest level of world-wide standards that will establish the core requirements in obtaining the UAE Seal of Approval. [53]
- The UAE AI Summer Camp 6.0 is a large-scale event offering various training sessions, workshops, webinars, and talks about Artificial Intelligence. Participants can learn from experts on a wide range of topics, including AI's future, Data Science, AI applications in focus sectors, robotics, AI ethics, governance, and cybersecurity [54].

Continuous Learning and Skill Development

- The UAE offers continuous upskilling for professionals through specialized AI training, secondments, and international study tours, focusing on bridging skill gap.
- Free courses are being run for UAE residents to raise awareness and understanding of AI technologies. Over 5000 UAE residents received specialized training on the fundamentals of AI with hands-on experience. [55]

Focus Sectors [53]



The UAE is leading AI development across various sectors, ensuring its transformation into a global leader in AI. In healthcare, AI is being applied to enhance diagnostics, predictive care, and personalized treatments, which improves patient outcomes and operational efficiency. In the education sector, AI is transforming personalized learning and adaptive teaching methods, helping to address diverse student needs and improving educational standards. In the energy sector, AI is crucial for optimizing energy consumption, enabling smarter grids, and supporting sustainability goals by reducing carbon emissions.

In transportation, AI powers autonomous vehicles, enhances traffic management systems, and improves public transportation services, contributing to smarter, safer, and more efficient urban mobility. These advancements are important as they position the UAE at the forefront of AI-driven innovation, fostering economic growth, improving public services, and aligning with global sustainability efforts.

AI Pillars

1	AI policies, regulations, and governance
2	Innovation, research, development, deployment
3	Secure data infrastructure and data sharing
4	Attracting and training AI talent
5	AI – driven entrepreneurship and economic growth through AI
6	Integrating AI into government services
7	Creating a supportive ecosystem for AI development
8	Building a robust talent pipeline and integrating AI education
9	Global AI Collaborations and Events

The key pillars of AI for the UAE focus on long-term investment in AI infrastructure, including data access and computational resources, to drive innovation. Ensuring that AI benefits all sectors, such as healthcare, education, and transportation, is critical for national development and improving overall productivity.

Effective governance and regulatory frameworks are also essential to protect public interests while fostering innovation. These pillars aim to position the UAE as a global leader in AI, contributing to sustainable growth and public well-being.

Key Developments in AI Domain:

The strategy outlines a long-term vision to be achieved by 2031, with the goal of positioning the UAE as a world leader in AI by that year.

1. AI Adoption across Key Sectors
    - Implement AI technologies in various key sectors, including transportation, healthcare, space, renewable energy, and education.
    - Use AI to enhance government services and operations, making them more efficient and citizen centric.
2. AI Driven Economy
    - Develop the UAE into a global hub for AI, attracting talent, investments, and companies specializing in AI.
    - Support the growth of AI startups and SMEs by providing funding, resources, and mentorship.
    - Integrate AI into the economy to drive innovation, productivity, and economic diversification.
3. AI Education and Workforce Development
    - Incorporate AI into educational curricula at all levels, from schools to universities, to build a future-ready workforce.
    - Offer specialized AI training and reskilling programs to prepare the current workforce for AI-driven jobs.
    - Establish AI research centres and partnerships with global institutions to advance AI knowledge and capabilities.
4. Ethical AI and Governance
    - Develop and implement ethical guidelines and governance frameworks for AI to ensure responsible usage.
    - Lead in the development of global AI standards and contribute to international discussions on AI ethics.
5. International Collaboration
    - Strengthen partnerships with global AI leaders to exchange knowledge, best practices, and innovations.
    - Participate in global AI initiatives & contribute to shaping international AI policies [53].
6. Dubai Data Initiative
    - Establishes a citywide data governance framework.
    - Promotes data sharing for informed decision-making.
7. Dubai Blockchain Strategy
    - Aims to make Dubai the first blockchain-powered city.

- Enhances efficiency, security, and transparency in government services [56].

8. AI Lab [57]
    - Provides AI tools for government entities.
    - Enhances service delivery and decision-making through AI.

9. Dubai IoT (Internet of Things) Strategy
    - The Smart Dubai Internet of Things Strategy is comprehensively designed to leverage a citywide partner network to secure and promote Dubai's digital wealth and deliver efficiency benefits and peace of mind to all city residents, visitors, business owners and public officials [58].
    - Builds robust IoT infrastructure for a smart city.
10. Digital Wellbeing Initiative:
    - Promotes balanced digital lifestyles.
    - Encourages responsible use of digital tools.
11. AI Sea-Cage Aquaculture Project:

    Abu Dhabi's Environment Agency has launched the first sea-cage aquaculture project in the region, incorporating artificial intelligence (AI) tools. This innovative initiative aims to ease pressure on wild fisheries by producing up to 100 tonnes of fish annually. AI technology monitors fish and water quality, ensuring sustainable aquaculture practices while addressing climate change impacts and promoting environmental sustainability in the UAE capital [59].

5.5 BENIN

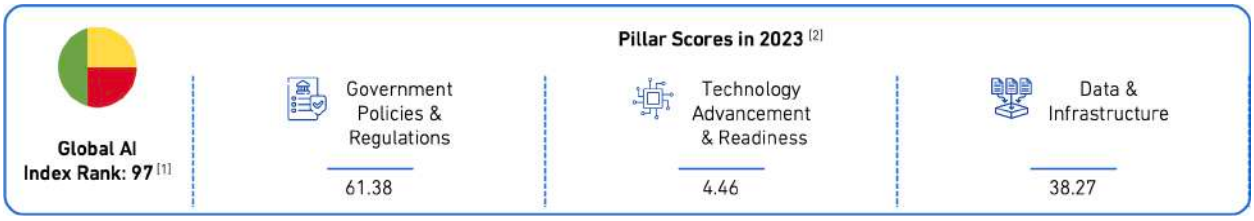


Figure 9 Benin Benchmark [1] [2]

Benin's National Artificial Intelligence and Big Data Strategy (2023-2027) plans to make the country a leader in AI in West Africa. The goal is to use AI technology to boost the economy and solve development problems. The plan is based on good governance, responsible use of AI, and building a strong system for handling data. Benin is working on using powerful AI tools to improve important areas like farming, health care, and government.

1. Government Strategy, Policies & Regulations

AI Policies and Regulations	▪ Benin has created a National Artificial Intelligence and Big Data Strategy (SNIAM), which is led by the Ministry of Digital Affairs and Digitalization. This strategy aims to make it easier to AI to grow and develop in the country. The legal rules include the Code of Digital Affairs, which was revised to help with AI and big data uses. [60]
AI Governance & Ethics	▪ SNIAM includes strategic objectives, guideline and plans regarding implementation of governance framework for AI and big data management in a phase manner. ▪ AI and big data management are managed by important national organizations, including the Agency for Information Systems and Digital Technology (ASIN). ▪ SNIAM includes strategic guideline to adapt the legal and regulatory framework to suit the new demands of AI. ▪ It highlights the importance of ethical rules and management in AI. It talks ethical issues and responsibilities as AI is used in different areas. [61]
Sustainable & Inclusive AI	▪ Initiated Benin smart government project that uses AI to improve public service delivery and make government processes more efficient, ensuring access to services for rural and underserved communities. ▪ Partnering with tech startups and research institutions to implement AI-powered tools like precision farming systems, which use data analytics to optimize fertilizer and water use, reducing waste and improving sustainability in farming

2. Technology Advancements & Readiness

AI Research and Development

- The Benin AI plan has a focus on improving the research and development dimension through the collaboration between the research centres and the companies, including Sèmè City, and through sharing technology for capacity building around acquiring skills.
- This includes setting up key infrastructures for AI research, putting in place data processing and storage systems, and training programs that boost expertise in AI and data handling. These are through efforts to make Benin an Artificial Intelligence leader in the region. [60]

AI Development and Integration

- The strategy aims to foster AI innovation by providing support to institutions such as Institut Supérieur de Mathématiques et de Sciences Physiques (IMSP) and IFRI Institut de Formation et de Recherche en Informatique (IFRI). It also seeks to build human capital and establish partnerships between research laboratories and the private sector. [60]

3. Data & Infrastructure

Data Availability

- Benin is devising a plan to build a data management system that provides good quality data available.
- Benin has begun to embrace open data initiatives, particularly through open data platform and collaborations with international organizations. The government is making efforts to improve the availability of public sector data in areas like agriculture, health, and education.

Data Management and Protection

- Benin has implemented the Personal Data Protection Act to regulate the collection, processing, and storage of personal data. This law is a critical step toward ensuring that data used in AI applications is handled responsibly and securely.
- SNIAM outlines the need for procedures and structures for data management and security; for instance, the National Interoperability Platform would be developed, and strict standards regarding data governance would be followed. [60]

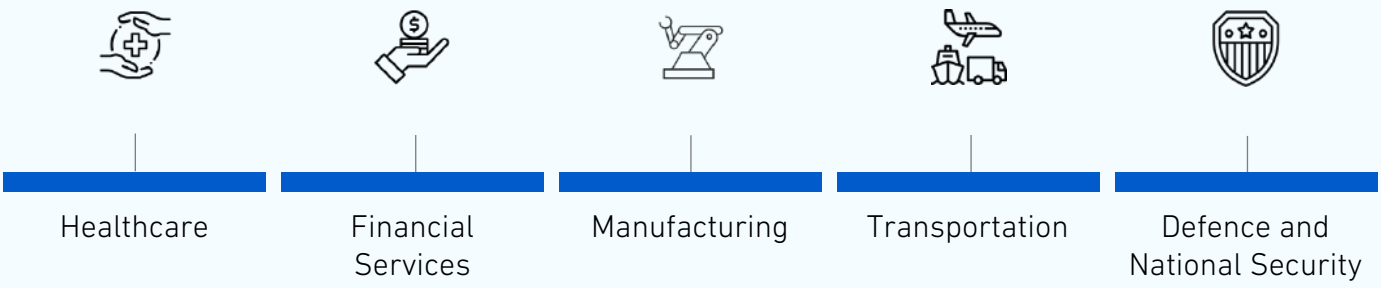
Data Quality	▪ SNIAM may ensure the availability of high-quality and high-quantity data for the entire AI ecosystem in Benin. ▪ To achieve this outcome, the SNIAM defines actions to define and introduce procedures for the data collection and provision chain
Infrastructure	▪ Benin is working on enhancing its data storage and processing infrastructure, with the goal of building local data centers and promoting cloud services. These data centers will help support the storage and processing needs of AI systems, allowing businesses and the government to store large datasets and run complex AI models locally, without relying solely on international infrastructure. ▪ Benin is collaborating with its neighbours in West Africa to develop regional digital infrastructure that can support AI. Through the Smart Africa Alliance, Benin participates in efforts to build interconnected digital ecosystems across African countries, including shared data centers, internet connectivity, and AI research hubs.
4. Impact of AI on Economy	
AI-Driven entrepreneurship	▪ Entrepreneurship is promoted under the strategy, including support to Sèmè City, one of the anchor institutions for AI entrepreneurship. The Fonds d'Appui à l'Entrepreneuriat Numérique - FAEN has a goal to support the development of businesses using AI. [60] ▪ Benin is taking initial steps to foster AI-driven entrepreneurship by encouraging the growth of tech startups that focus on AI and other digital technologies. Several startup incubators and innovation hubs have emerged in Cotonou and other cities, offering support to entrepreneurs working on AI applications.
International Collaboration	▪ The strategy promotes subregional and international collaboration in AI, with AFRIA, ECOWAS, and Smart Africa being some of them, for sharing knowledge and best practices. [60] ▪ Benin is actively engaging in international collaborations to strengthen its AI ecosystem. It collaborates with organizations like the World Bank, African Development Bank (AfDB), and United Nations to gain access to resources, expertise, & funding for AI development.

Investments in AI	▪ The strategy has invested significantly in the development of AI. The estimated funding from 2023 to 2027 stands at approximately CFAF 4.68 billion, of which the public-private partnership is one of the most significant mechanisms of funding. [60]
Public Private Partnerships	▪ There are partnerships in Benin involving universities, research centres, and companies. Benin aims to strengthen AI research capabilities with international partners such as the ECOWAS and SMART Africa. The fact that investment in AI research is encouraged makes for various academic partnerships and structures possible such as FabLabs. [60] ▪ Benin is working closely with technology companies, telecom providers, and financial institutions to accelerate the deployment of AI solutions. Collaborations between the government and private tech firms are driving AI applications in telecommunications, smart cities, and digital banking.

5. Talent and Skill

AI Education and Training Programs	▪ Benin seeks to strengthen AI capabilities by integrating AI and big data training within the educational system. The strategy creates specific degrees in AI, and further training of manpower in both public and private sectors. ▪ Benin is making early efforts to integrate AI-related topics into the curricula of universities and technical institutions. Universities such as the University of Abomey-Calavi are beginning to offer programs that cover data science and AI fundamentals.
Continuous Learning and Skill Development	▪ Benin is promoting the development of online learning platforms that provide access to AI-related courses and digital skills development. ▪ The government of Benin is investing in digital and AI skill development programs for civil servants and public sector workers.

Focus Sectors [62]



Benin's AI strategy focuses on consolidating governance for ethics in the use of AI, enhancing data infrastructure, and encouraging innovation through strategic partnerships with academia and the private sector. The country pursues AI research and commits to financially and institutionally supporting AI-powered startups. AI education and continuing skills development are also part of Benin's strategic focus, placing the country as a regional leader in the use of AI in industries such as agriculture, healthcare, and public administration.

AI Pillars

1	Strategic vision, AI policies, governance, ethics
2	Innovation, research, development, deployment
3	Data availability, quality, infrastructure for AI
4	AI – driven entrepreneurship and economic growth through AI
5	AI education and skill development
6	Fostering an environment for AI research and innovation

Key Developments in AI Domain:

The strategy outlines a vision for AI development over the coming years, but specific dates for implementation are not detailed.

1. Support Research, Innovation, and Private Sector Development
    - Working together with universities, research laboratories, and private companies to support new ideas in AI. This includes helping projects like the ones run by Sème City, a centre for starting new businesses and coming up with new ideas.
    - Creating lasting ways to fund research, new ideas, and businesses in artificial intelligence (AI). This involves getting money by working together with businesses and working with other countries.
2. Development and Implementation of High-Impact AI Solutions
    - Realizing AI applications in agriculture, health, public administration, and infrastructure. It shall propose the development of solutions in AI for job application forecasting, fraud document detection, and logistical flow optimization.
    - Equipping the existing National Data Centre with AI services like Data-Lake-as-a-Service and Machine Learning-as-a-Service will enable the deployment and integration of AI solutions. [62]
3. Equipping the existing National Data Centre with AI services like Data-Lake-as-a-Service and Machine Learning-as-a-Service to support the deployment and integration of AI solutions.
4. Benin-Canada AI Collaboration - In March 2024, Benin and Canada entered a partnership in the digital economy with artificial intelligence. This gave full meaning to laying a foundation for using AI as a strategic driver for innovation and economic growth, especially in areas where both nations are focused [63].
5. Responsible AI Governance - Benin has evolved much in terms of responsible AI governance, outperforming many countries such as Nigeria and Senegal. This points out the commitment of Benin to ethical AI practices, thus setting the country at the core of responsible AI governance within the region [64].
6. Customs System Modernization - In August 2022, the Republic of Benin adopted the AI-based solution called "Custom Webb" for customs, replacing the older Sydonia World system. The modernization of customs reflects a series of measures within the overall strategy of Benin in AI use to improve performance related to public administration and services [65] .
7. AI Deployment by MTN Benin - MTN Benin has been deploying AI and machine learning solutions to address throughput challenges. This is in partnership with Ericsson and forms part of wider efforts at improving the overall telecommunications infrastructure in the country [66] [67].
8. AI Focused on Local Languages - The government of Benin initiated the development of an AI focused on local languages in May of 2024. The goal is to develop

conversational AI to support the linguistics found in the country and allow access to solutions to all citizens [68].

9. AI and Big Data Initiatives - AI and Big Data Initiative: In July 2023, the Republic of Benin has hosted, for the second time in a row, close to 1,000 participants in the SENIA Digital Entrepreneurship and Artificial Intelligence Fair. The event symbolizes its ambition to make Benin a major player in AI/big data but also contributes to the advancement of an appropriate digital ecosystem. [69]
10. Benin's AI Strategy - In January 2023, the Government of Benin signed a national AI strategy that aimed at integrating the application of AI into various sectors such as education, health, agriculture, and tourism, amongst others, to place Benin as a digital service benchmark in West Africa by leveraging the power of AI toward economic and social development. [60]
11. Benin AI Hackathon - The National AI strategy, launched in January 2024, pursued an ambitious integration of AI into strategic sectors like education, health, agriculture, and tourism, placing Benin in a strategic position to hold a significant place in the sector of digital services using AI in the rapid economic and social development of West Africa [70]. These were the winner projects:
    - Benin Interactive Video: This interactive video has broken barriers in video interaction by the possibility of interacting with the content of one's language, saving lots of time from breaking barriers in languages. During the Benin Multimodal AI Hackathon, this tool will be able to let the user easily transcribe any video and get AI-driven questions out of that transcription. The application might as well branch into other languages shortly with the aim of creating inclusion and accessibility of knowledge in the world.
    - Dôkun: It is an application that serves as a meeting point for local and foreign language speakers using AI for cultural heritage. Cultural resources such as music, dance, film, and tourist sites. Some of the key features include Speech-to-Speech translation between the local languages and foreign ones, French and English. Other features include subtitling of videos and voice dubbing. These additional features target mainly multimedia professionals and local content creators. Since the demand for local content in Benin is on the rise, its creators are uploading their videos to be translated or subtitled, which after a fee is paid toward keeping the site running, become downloadable.
    - Assistant Vocal Multifunctional: This is a new mobile phone application that gives an advanced range of features. The voice assistant will enable users to command their phone in their native African language for calling, switching on their flashlight, and setting alarms. This will be along with the special feature of text extraction from photos in French, English, or Spanish and converting it into an audio-based local language. In other words, it would mean taking a prescription written in the French language and based on that, giving an audio

output in the local language so that it can be understood. An added advantage is that it provides for internet search through voice-based commands, and this app will give the results in the desired language of the users.

- Benin 360: This app is for promoting tourism in Benin, with the addition of video captioning and dubbing in Yoruba and French using state-of-the-art speech recognition and machine translation. Most importantly, an interactive chatbot based on advanced Retrieval-Augmented Generation technology will be able to provide specific details on landmarks, cultural festivities, and tourist spots, making this application an all-inclusive travel companion, thereby allowing one to enhance his or her experience in discovering the rich cultural heritage of Benin.
- Sustainability and Cultural Heritage with AI: The Linguapix App bridges languages with perfect video translation and subtitling from international languages like French and English into local Benin languages such as Yoruba, Fon, and Dendi. Integrating new AI models ensures quality and culturally relevant translations. This application provides the generation of native language images, and the dubbing of videos takes it one step further concerning localizing audio tracks. These features make Linguapix contribute to developing digital content that is inclusive and accessible for linguistic diversity in Benin.
- Smart Video Transcriber: This innovative, AI-enabled web application allows people have a very personal, multilingual experience in video-watching. Advanced technologies will make it possible for automated video dubbing: replacing the audio in one language with the audio in another, say Fon or Yoruba, to add the option of adding several subtitled languages to make sure access and cross-cultural understanding from anywhere in the world are well-provided.

The strategic efforts of Benin in AI are aimed at positioning the nation on the continent as a leading force in AI for West Africa through the strengthening of the digital economy. International collaboration, responsible AI governance, modernization of public systems, and attention to local content and language have indeed formed the bedrock upon which such giant leaps have been made in the digital ecosystem of Benin.

6. IMPORTANT LEARNINGS FOR AI-REAL TOOLKIT

To ensure the successful implementation and advancement of AI strategies, it is essential to draw on key learnings and best practices from leading AI nations around the world. By integrating these proven strategies, nations can position themselves at the forefront of AI innovation, driving positive outcomes for both their citizens and the global community. Below are the most learnings that should guide efforts moving forward [30][34][53][62][20]

01 Government Strategy, Policies & Regulation

- *Ethical AI Governance:* A strong focus on testing and implementing real-world AI systems within government operations before widespread adoption ensures policies are practical and aligned with public needs.
- *Pro-Innovation Regulation:* Governments should balance innovation with governance. By creating a flexible regulatory framework, countries can foster AI development while ensuring ethical standards, transparency & bias.
- *Sector-Specific Strategies:* Several strategies recommend tailoring AI policies to target specific high-growth sectors, allowing targeted regulations.
- *Phased Policy Implementation:* Gradually introducing AI regulations based on the technological and infrastructure maturity of a country.
- *International Collaboration:* Building partnerships for AI governance, particularly around data-sharing and cross-border AI development, strengthens the ethical and technical frameworks, encouraging global best practices

02 Technology Advancements & Readiness

- ***Invest in R&D:*** Continuous investment in research and development for AI, especially in frontier technologies like advanced computing and quantum, is crucial to stay competitive and innovate faster.
- ***Cross-Industry AI Deployment:*** Encourage the use of AI across a wide range of sectors through specific incentives and support for AI startups, as well as public-private partnerships that facilitate the diffusion of AI technologies.
- ***AI as a Service (AIaaS):*** Offering AI as a service (e.g., Machine Learning as a Service or Data Lakes) can accelerate AI readiness in sectors where technical expertise or infrastructure is limited.
- ***Compute Infrastructure Development:*** Strengthen access to high-performance computing and AI-focused hardware, which are foundational for advancing AI capabilities, especially in data-heavy focus industries.

03 Data & Infrastructure

- ***Unified Data Platforms:*** A central, unified data-sharing infrastructure can accelerate AI adoption by making high-quality, real-time data accessible to innovators and researchers while ensuring privacy and security.
- ***Open Data Policies:*** Governments should promote open data standards to ensure that organizations can access valuable data for training AI models, particularly in sectors like healthcare, finance, and public services.
- ***Data Governance and Privacy:*** Establish clear data governance policies that enable AI development while addressing data protection, privacy, and bias, ensuring public trust in AI systems.
- ***Data Readiness Assessments:*** Countries that provide self-assessment tools for organizations to evaluate their data infrastructure help businesses prepare for AI adoption, ensuring readiness at all levels.

04 Impact of AI on Economy

- *AI as a Growth Catalyst:* AI should be positioned as a key driver for economic growth by integrating it into high-impact sectors. The integration of AI can lead to increased efficiency and productivity.
- *AI for Public Services:* Governments can lead by example by using AI in public sectors (e.g., health, education, transportation) to drive efficiency, deliver better services, and promote AI adoption across industries.
- *Job Creation and Economic Competitiveness:* Countries that implement AI strategically across industries can not only boost productivity but also create new types of jobs, particularly in AI-related fields.
- *Sectoral AI Adoption:* Specific sectors like healthcare, transportation, and security should be targeted for AI integration due to their high impact on both economic growth and public welfare.

05 Talent and Skill Development

- *AI Upskilling Programs:* Investment in upskilling programs, including AI-specific boot camps, PhD scholarships, and AI fellowships, is critical to developing a talent pipeline that can meet the future demand for AI specialists.
- *Diverse Workforce Development:* Prioritizing diversity in AI talent development through targeted scholarships for underrepresented groups ensures a more inclusive workforce capable of addressing broader public needs.
- *Partnerships Between Academia and Industry:* Encouraging collaboration between universities, research institutes, and industries ensures that graduates are job-ready, with practical AI skills applicable to real-world problems.
- *Attracting Global Talent:* Countries should establish visa regimes and career incentives to attract and retain top global AI talent, fostering innovation and

KEY INITIATIVES ACROSS FOCUS SECTORS

The following summary outlines how the USA, UK, UAE, Benin, and Singapore are leveraging AI to tackle challenges and unlock opportunities across various sectors. These examples provide valuable insights for the countries globally, including the DCO Member States aiming to align their efforts with global best practices in AI-driven development.

1. Healthcare:
   Investment in Research & Development is basic for cultivating development in AI-driven healthcare arrangements such as AI in diagnostics, treatment, and healthcare administration frameworks.
   USA: The USA has progressed AI applications in healthcare through activities just like the FDA's AI/machine learning (ML) activity arrange, supporting AI-driven diagnostics and restorative imaging developments.
   UK: The UK's National Health Service (NHS) is utilizing AI apparatuses to identify illnesses prior, particularly in cancer screening, and leveraging AI in therapeutic organization to make strides understanding administration.
   UAE: The UAE has propelled AI-driven healthcare arrangements through associations between open and private segments, centring on telemedicine and AI-assisted diagnostics.

2. Education:
   The primary focus should be upskilling and reskilling through AI-driven instruction tools. Public-Private Organizations (PPP) are pivotal for coordination AI into educational program and creating AI-powered deep rooted learning programs.
   Singapore: Singapore has integrated AI into its instruction framework by utilizing personalized learning stages and emphasizing AI education from essential schools to colleges, with solid government support for AI development in instruction.
   UK: The UK is cantered on AI for personalized learning, improving computerized skills, and supporting STEM instruction, particularly through associations between the scholarly community and industry for AI upskilling programs.
   UAE: The UAE has propelled a few AI instruction activities, counting the UAE AI Camp, which points to upskill youthful individuals in AI and coding.

3. Transportation:
   Significant investments in AI for smart mobility are needed. Key methodologies incorporate implementing AI for independent vehicles, optimizing activity stream, and guaranteeing the safety and security of transportation framework.

USA: The USA could be a pioneer in AI for independent vehicles, with companies like Tesla and Waymo spearheading self-driving innovation, backed by government activities to progress security and direction.
Singapore: Singapore has actualized AI-driven savvy activity frameworks to optimize activity administration and is investigating independent vehicle advances for open transport and coordination's.
UAE: The UAE's Dubai Independent Transportation Methodology points for 25% of all transportation to be independent by 2030, driven by AI frameworks for keen activity administration and independent vehicles.

4. Energy:

AI plays a part in optimizing vitality networks and upgrading maintainability endeavours. Governments ought to prioritize the improvement of AI-driven arrangements for vitality productivity, renewable vitality integration, and prescient support of foundation.
UK: The UK's vitality segment is progressively utilizing AI for prescient support in vitality networks, especially in overseeing renewable vitality sources like wind and sun powered control.
UAE: The UAE employments AI in its vitality methodology, particularly in optimizing sun powered control and joining AI-driven vitality administration frameworks into keen cities to upgrade supportability.
USA: The USA is leveraging AI within the vitality division to optimize network administration and bolster the integration of renewable vitality, as well as for prescient support of foundation.

5. Financial Services:

AI can enhance financial inclusion and improve operational efficiencies through automation. Emphasis should be placed on ethical AI practices, fraud detection, and risk management in financial institutions.
UK: The UK's financial sector is heavily invested in AI, particularly for fraud detection and compliance, and is also pioneering fintech innovations using AI for personalized banking services.
Singapore: Singapore's financial industry is a leader in AI adoption for automated trading, fraud detection, and regulatory compliance, supported by the Monetary Authority of Singapore's AI-driven initiatives.
UAE: The UAE's financial sector is adopting AI to enhance risk management and customer services, with a focus on using AI for fraud detection and improving overall efficiency in banking operations.

6. Manufacturing:

   AI is revolutionizing smart manufacturing through computerization, prescient upkeep, and upgraded generation productivity. Nations ought to contribute to AI-driven innovations such as mechanical technology, IoT integration, and AI-powered analytics for real-time optimization.

   USA: The USA is leveraging AI for mechanical robotization and shrewd industrial facilities, centring on prescient support, quality control, and supply chain optimization.

   UK: The UK has embraced AI-driven innovations in fabricating to progress efficiency and advancement through activities like "Made More brilliant," which underpins computerized change in industrial facilities.

   Singapore: Singapore's government is advancing savvy fabricating through the utilize of AI and mechanical technology to improve efficiency in high-tech businesses such as gadgets and biotechnology.

7. Defence & National Security:

   AI plays a crucial part in improving national security and protection capabilities. Nations ought to centre on creating AI-driven reconnaissance frameworks, cyber protection methodologies, and independent resistance innovations.

   UK: The UK's Ministry of Defence coordinates AI for risk discovery, cyber protection, and independent military frameworks, with an accentuation on moral AI in fighting.

   UAE: The UAE has been contributing in AI to reinforce its cybersecurity framework and improve its guard capabilities, centring on AI-driven observation and independent frameworks for national security.

8. Safety & Security:

   AI can essentially move forward open security by giving progressed reconnaissance frameworks, wrongdoing forecast instruments, and real-time reaction components. Speculation in AI for security and security can help governments superior ensure citizens and foundation.

   Singapore: Singapore employments AI-driven video analytics for open security, leveraging observation frameworks to screen and react to security dangers in genuine time.

   USA: The USA employments AI for law requirement, counting prescient policing devices and AI-driven wrongdoing mapping, making a difference offices anticipate and react to criminal exercises more successfully.

9. Smart Cities & Estates:

   AI plays an imperative part within the advancement of savvy cities: real-time data-driven decision-making, effective urban administration, and the quality of life all

advantage from it. The application of AI innovations permits asset optimization in shrewd domains, superior vitality proficiency, and economical urban development.

Singapore: Singapore has been at the cutting edge of keen city activities. Overseeing activity, squander, and vitality includes the utilize of AI. Domain administration will be coordinates with AI for feasible urban arranging.

UAE: The UAE's "Smart Dubai" initiative aims to leverage AI across various city functions, including infrastructure, transportation, and public services, creating a fully connected and efficient urban environment.

UK: The UK is implementing AI in its "Smart London" plan, using data-driven approaches to improve urban living through AI-powered transport systems and public service management.

Adopting these best practices will empower countries to establish a robust foundation for AI innovation, essential for addressing the unique challenges and opportunities that this technology brings. By focusing on critical areas such as ethical governance, data management, talent development, and sector-specific applications, countries can develop sustainable AI ecosystems that promote economic growth, improve public services, and enhance quality of life. Incorporating these insights into the AI-REAL Toolkit will facilitate an assessment of AI readiness and accelerate AI adoption.

CONCLUSION

The key learnings are based on important outcomes from the benchmarking analysis of the global AI leading and emerging countries. These learnings cover key trends, commonalities and important initiatives, ensuring that they align with global best practices in AI adoption. Aim is to incorporate these learnings in the AI-REAL Toolkit to provide practical recommendations that will enable the countries globally, including the DCO Member States to drive AI development and integration effectively.

Key learnings to be considered in the AI-REAL Toolkit

Phased Rollout of Regulations

Countries should adopt a phased approach to AI governance, aligning regulations with infrastructure to balance innovation and ethics.

Cross-Border Collaboration

International partnerships in research and regulation are essential for countries, as they enhance AI capabilities and governance through knowledge exchange and shared resources.

Unified Data-Driven Approach

Building robust, centralized data infrastructures is crucial for AI growth. Countries should invest in promoting data interoperability, data-sharing platforms, open data policies, and data protection

Adoption of AI in Focus Sectors

AI initiatives should focus on high-impact sectors, which are crucial to their economy and society. Early adoption in these areas will lay a solid foundation for wider AI integration.

Education and upskilling

Countries should prioritize developing AI talent through education, training, and international talent acquisition. Encouraging this across diverse groups to ensure long-term sustainability & growth.

Innovation

Foster innovation by creating collaborative environments that encourages experimentation and development of AI technologies by supporting R&D, startups, incubators.

To conclude, the countries globally, including the DCO Member States should adopt a phased approach to AI governance, ensuring that regulations evolve alongside infrastructure and readiness to balance innovation and ethical oversight. Emphasize cross-border collaboration in research and regulation, as it will enhance AI capabilities and governance frameworks through shared knowledge and resources. Invest in robust, centralized data infrastructures and promote data-sharing and protection policies, as they are crucial for scalable and trustworthy AI growth. Moreover, build comprehensive AI talent pipelines through education, training, and international collaborations to ensure that the countries have the skilled workforce needed to sustain AI innovation and economic development.

APPENDIX

1. Mapping of Benchmarking Dimensions across sources

Outcome of Literature Review	Input from Member State through Survey	Common Sub-Dimensions	AI Pillars (Dimensions for Benchmarking)
AI Policies and Regulations	Policies	AI Policies and Regulations	Government Policies & Regulations
Government Strategy		AI Governance	
Governance and Ethics		AI Ethics and Responsible AI	
Innovation Capacity & Innovation Output	Innovation	Innovation	Technology Advancements & Readiness
Research Output	Research and Development Digital Development	AI Research & Development	
IT Maturity & Advancements		AI Deployment & Integration	
Data Availability	Data	Data Availability	Data & Infrastructure
Governance & Ethics	Data	Data Management & Protection	
Data Representativeness	Data	Data Quality	
Infrastructure	Infrastructure	Infrastructure	
AI Start-ups		AI-Driven entrepreneurship	Impact of AI on Economy
AI Start-ups/ Investments	Partnership	Public-Private Partnerships	
Investments/ Education	Collaboration	International Collaborations	
Investments	Funding and Investments	Investments in AI	
Talent	Talent	AI Education & Training Program	Talent & Skill
Education	Talent	Continuous Learning and Skill Development	

Table 3: Mapping of AI Pillars

The table of dimensions and sub-dimensions finalised through the outcomes of literature reviews and inputs obtained from the member states through the survey. These dimensions and sub-dimensions are used in benchmarking the global AI leading and emerging countries.

2. Potential limitation of the benchmarking analysis

1. Evolving Nature of AI Readiness: AI is a rapidly evolving field, with new technologies, policies, and best practices emerging regularly. This dynamic nature makes it difficult to capture the current state of AI readiness accurately, as the situation can change quickly.
    - Impact: The findings and insights from the benchmarking analysis may become outdated or less relevant over time, necessitating continuous updates and revisions to the AI Readiness Toolkit.
2. Bias in Global Indices: Some global AI indices may have inherent biases based on the perspectives and priorities of the organizations that develop them. For example, certain indices might prioritize technological innovation over ethical considerations, or vice versa.
    - Impact: The presence of such biases could skew the benchmarking results, favouring countries that align with specific criteria while overlooking others that may excel in different areas.
3. Challenges in Measuring Long-term Impact: AI's long-term impact on economies, societies, and industries is difficult to measure due to the complexity and interdependence of various factors. Short-term metrics may not fully capture the sustained impact of AI initiatives.
    - Impact: The focus on immediate outcomes could lead to an underestimation of countries that are investing in long-term AI strategies, affecting their ranking in the benchmarking process.

By acknowledging these limitations, the benchmarking analysis will present a more balanced and critical perspective, highlighting the complexities involved in evaluating AI readiness and adoption across different countries. This approach also emphasizes the need for continuous review and adaptation of the AI Readiness Toolkit to remain relevant and effective.

3. Reference Figures

UK AI Strategy

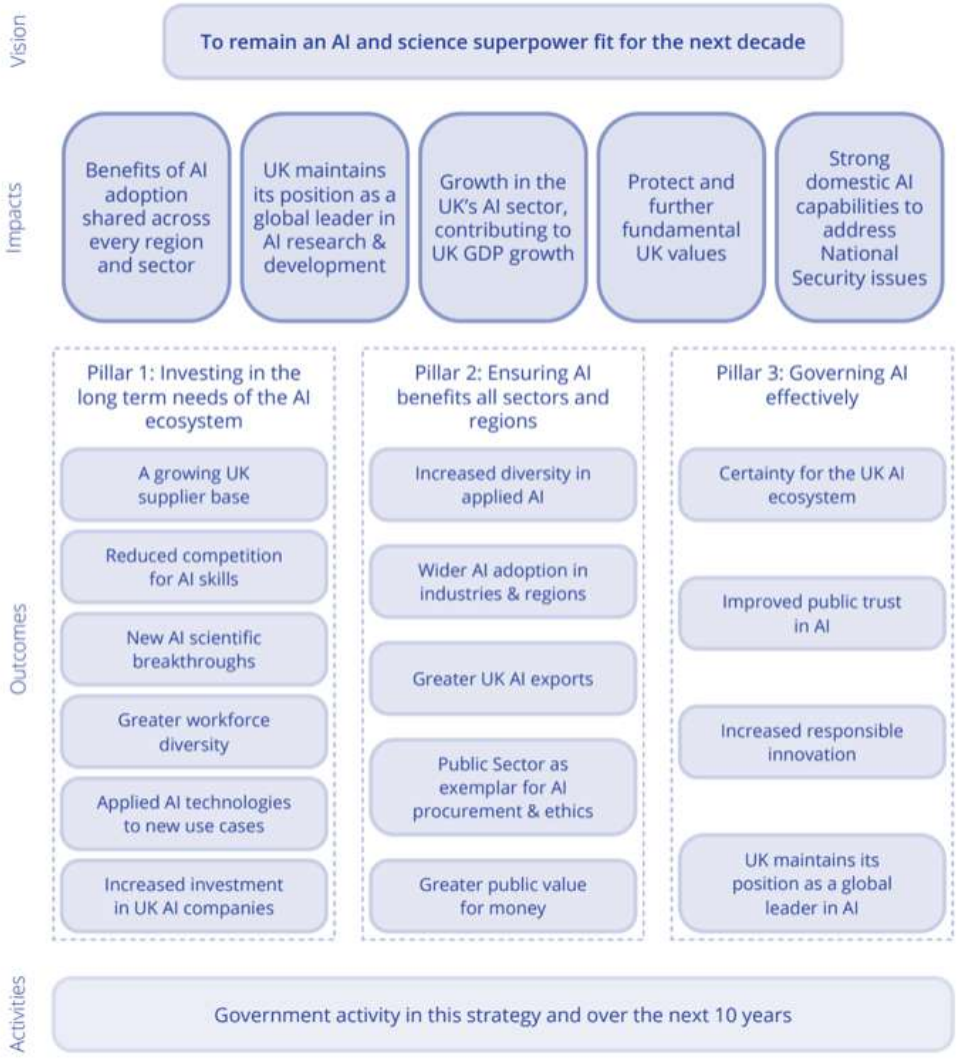


Figure 7 UK's National AI Strategy [34]

UAE AI Strategy

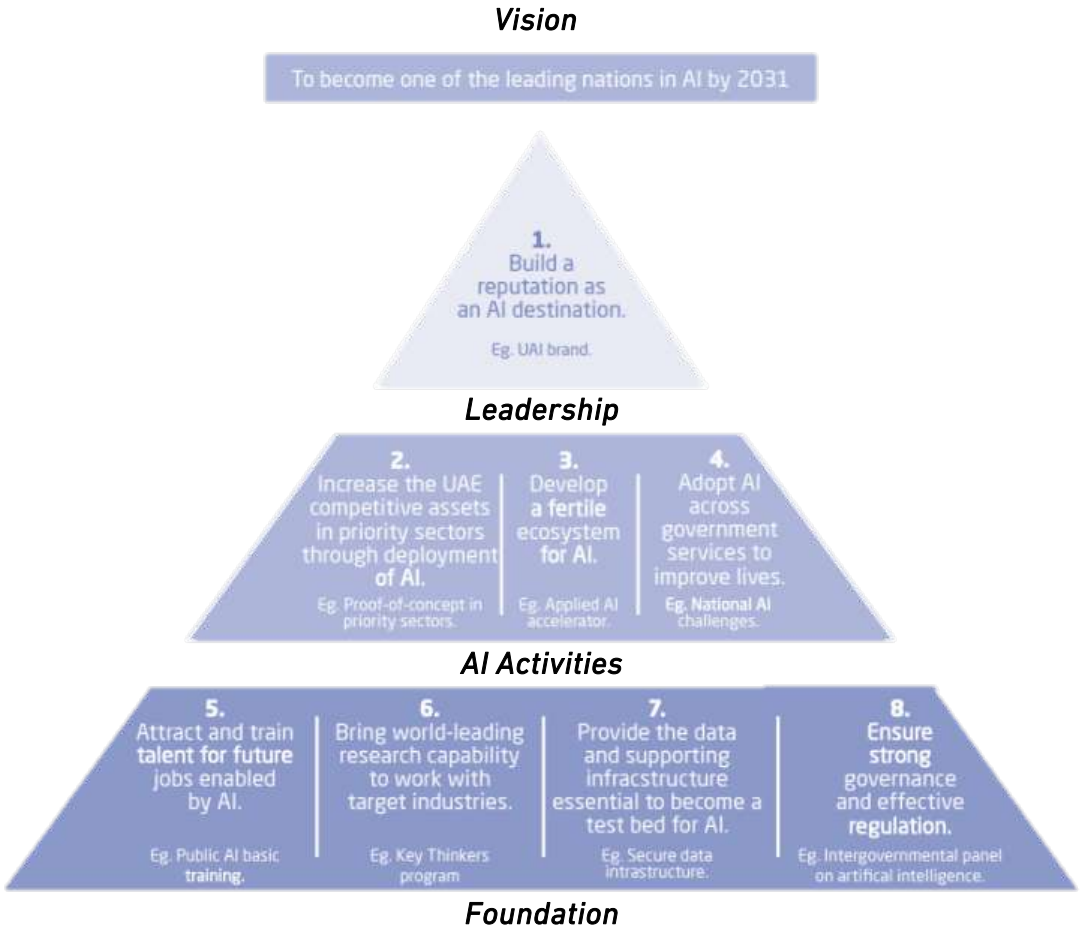


Figure 8 UAE's Strategy Vision [53]

Benin AI Strategy

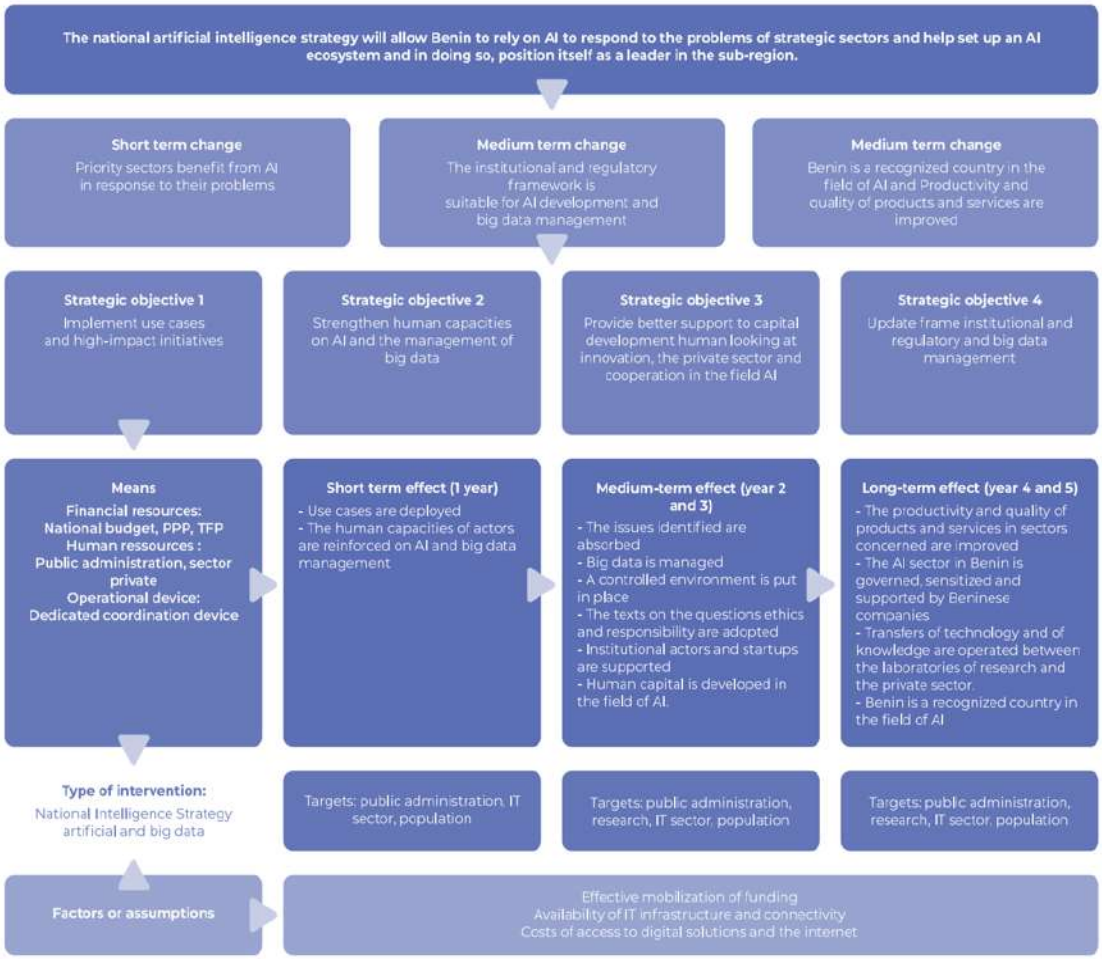


Figure 9 Theory of Change [62]

4. Table of abbreviations

Abbreviation	Full Form
AFRIA	African Research and Innovation Alliance
AI	Artificial Intelligence
AI Bill of Rights	Artificial Intelligence Bill of Rights
AIAP	AI Apprenticeship Program
CDC	Centers for Disease Control and Prevention
CHIPS	Creating Helpful Incentives to Produce Semiconductors
DoE	Department of Energy
ECOWAS	Economic Community of West African States
FAEN	Fonds d'Appui a l'Entrepreneuriat Numerique
FDA	Food and Drug Administration
GPAI	Global Partnership on Artificial Intelligence
IFRI	Institut de Formation et de Recherche en Informatique
IMSP	Institut de Mathematiques et de Sciences Physiques
IRM	Bureau of Information Resource Management
LAWS	Lethal Autonomous Weapons Systems
M/SS	Office of Management Strategy and Solutions
MBRIF	Mohammed bin Rashid Innovation Fund
MBRIF	Mohammed Bin Rashid Innovation Fund
MHRA	Medicines and Healthcare products Regulatory Agency
ML	Machine Learning
NAIIO	National Artificial Intelligence Initiative Office
NAIRR	National AI Research Resource
NHS	National Health Service
NLP	Natural Language Processing
OECD	Organisation for Economic Co-operation and Development
PPP	Public-Private Partnership
R&D	Research and Development
SNDGO	Smart Nation and Digital Government Office
TET	Technology Engagement Team
UNESCO	United Nations Educational, Scientific and Cultural Organization
WDQI	Workforce Information Quality Initiative

5. Glossary

Abbreviation	Full Form
AI Adoption	The process of integrating Artificial Intelligence technologies into various industries and sectors to enhance operational efficiency and innovation.
AI CoEs	Dedicated institutions or units focused on advancing AI research, development, and deployment in specific sectors or industries.
AI Ecosystem	A network of stakeholders, including governments, industries, academic institutions, and developers, collaborating to advance AI technology and its applications.
AI Governance	The policies, standards, and frameworks used to ensure responsible and ethical AI development and deployment.
AI-Driven Solutions	Advanced technologies that use algorithms, data analysis, and computational power to automate processes, make predictions, and learn from data without explicit programming
Citywide data governance	Comprehensive management and oversight of data across an entire city to ensure its proper use, security, and accessibility
Data Annotation	The process of labelling data to provide context to AI models, enabling the system to understand and process the data correctly.
Digital Infrastructure	The underlying framework, including data centres, cloud computing resources, and networks, required to support AI technologies and their applications.
AI-Driven entrepreneurship	The development of new AI-based businesses, startups, and innovations, often supported by public and private investments.
Federated Learning	A machine learning approach where models are trained across decentralized devices or servers, ensuring that data remains localized and private.
Homomorphic	A form of encryption that allows data to be processed while still encrypted, ensuring privacy and security in AI applications.
Human-AI	The integration of AI systems to enhance human decision-making and productivity by allowing humans and AI to work together effectively.
Innovation Sandbox	A controlled environment that allows companies and researchers to experiment with AI technologies under regulatory oversight without facing the full range of compliance requirements.
PETs	Technologies designed to enhance data privacy and security, enabling safe data sharing and AI development while protecting sensitive information.
Public-Private Partnerships	Collaborative arrangements between government entities and private organizations to develop and implement AI technologies.
Responsible AI	AI systems that are developed and operated with an emphasis on transparency, fairness, accountability, and the avoidance of biases.
Synthetic data generation	The creation of artificially generated data that mimics real-world data for training AI models, ensuring privacy and expanding data availability.

6. Bibliography

[1] "Tortoise," [Online]. Available: https://www.tortoisemedia.com/intelligence/global-ai/#pillars.

[2] Oxford. [Online]. Available: https://oxfordinsights.com/wp-content/uploads/2023/12/2023-Government-AI-Readiness-Index-2.pdf.

[3] "Statista," [Online]. Available: https://www.statista.com/outlook/tmo/artificial-intelligence/united-states#market-size.

[4] "The White House Launches the National Artificial Intelligence Initiative Office," [Online]. Available: https://trumpwhitehouse.archives.gov/briefings-statements/white-house-launches-national-artificial-intelligence-initiative-office/.

[5] https://www.veriff.com/fraud/learn/ai-executive-order.

[6] https://www.hklaw.com/en/insights/publications/2023/07/the-ftc-is-regulating-ai-a-comprehensive-analysis.

[7] https://www.whitehouse.gov/ostp/ostps-teams/nstc/select-committee-on-artificial-intelligence/.

[8] https://www.eeoc.gov/ai.

[9] https://www.whitehouse.gov/ostp/ai-bill-of-rights/.

[10] https://www.congress.gov/bill/116th-congress/house-bill/6216.

[11] https://www.congress.gov/bill/117th-congress/house-bill/4346.

[12] "OpenAI," [Online]. Available: https://openai.com/.

[13] https://data.gov/.

[14] https://resources.data.gov/categories/data-management-governance/.

[15] "Data quality campaign," [Online]. Available: https://dataqualitycampaign.org/.

[16] "WDQI usa," [Online]. Available: https://www.dol.gov/agencies/eta/performance/wdqi/grants .

[17] "CDC," [Online]. Available: https://www.cdc.gov/surveillance/data-modernization/index.html.

[18] https://nairrpilot.org/.

[19] https://new.nsf.gov/focus-areas/artificial-intelligence#national-ai-research-institutes-c99.

[20] O. o. S. a. T. Policy, May 2023. [Online]. Available: https://www.whitehouse.gov/wp-content/uploads/2023/05/National-Artificial-Intelligence-Research-and-Development-Strategic-Plan-2023-Update.pdf.

[21] https://new.nsf.gov/focus-areas/artificial-intelligence#:~:text=As%20part%20of%20the%20%22National,to%20computational%20resources%2C%20high%2Dquality.

[22] "USA AI," [Online]. Available: https://www.state.gov/artificial-intelligence/.

[23] "Bureau of Information Resource Management," [Online]. Available: https://www.state.gov/bureaus-offices/under-secretary-for-management/bureau-of-diplomatic-technology/.

[24] "Northstar," [Online]. Available: https://www.state.gov/bureaus-offices/under-secretary-for-public-diplomacy-and-public-affairs/bureau-of-global-public-affairs/.

[25] "Global Emergent Center," [Online]. Available: https://www.state.gov/bureaus-offices/under-secretary-for-public-diplomacy-and-public-affairs/global-engagement-center/.

[26] "Technology Engagement Team," [Online]. Available: https://www.state.gov/bureaus-offices/under-secretary-for-public-diplomacy-and-public-affairs/global-engagement-center/technology-engagement-division/.

[27] "Office of Management Strategy and Solutions," [Online]. Available: https://www.state.gov/bureaus-offices/under-secretary-for-management/bureau-of-diplomatic-technology/.

[28] "Office of the Legal Adviser," [Online]. Available: https://www.state.gov/bureaus-offices/secretary-of-state/office-of-the-legal-adviser/.

[29] https://ww2.aip.org/fyi/senate-ai-blueprint-proposes-emergency-r-d-surge#:~:text=Non%2Ddefense%20AI%20R%26D%20spending%20reached%20about%20%243%20billion%20in,group%20that%20compiled%20the%20figures..

[30] S. N. a. D. G. O. (SNDGO), December 2023. [Online]. Available: https://file.go.gov.sg/nais2023.pdf.

[31] "Singapore's AI startegy 2019," 2019. [Online]. Available: https://file.go.gov.sg/nais2019.pdf .

[32] https://data.gov.sg/.

[33] "AI Singapore," [Online]. Available: https://aisingapore.org/.

[34] O. f. A. Intelligence, September 2021. [Online]. Available: https://assets.publishing.service.gov.uk/media/614db4d1e90e077a2cbdf3c4/National_AI_Strategy_-_PDF_version.pdf.

[35] https://www.gov.uk/government/groups/ai-council.

[36] https://www.turing.ac.uk/research/research-projects/ai-standards-hub.

[37] https://www.gov.uk/government/news/mhras-ai-regulatory-strategy-ensures-patient-safety-and-industry-innovation-into-2030.

[38] https://www.gov.uk/government/organisations/centre-for-data-ethics-and-innovation/about#:~:text=The%20Centre%20for%20Data%20Ethics,on%20DSIT's%20GOV.UK%20page..

[39] https://www.bankofengland.co.uk/research/fintech/ai-public-private-forum.

[40] https://www.ukri.org/what-we-do/ukri-challenge-fund/artificial-intelligence-and-data-economy/.

[41] https://transform.england.nhs.uk/ai-lab/.

[42] https://www.gov.uk/data-protection.

[43] https://www.hpe.com/us/en/newsroom/press-release/2023/11/uk-government-invests-225m-to-create-uks-most-powerful-ai-supercomputer-with-university-of-bristol-and-hewlett-packard-enterprise.html.

[44] https://www.archer2.ac.uk/.

[45] "2,500 new places on artificial intelligence and data science conversion courses now open to applicants," [Online]. Available: https://www.gov.uk/government/news/2500-new-places-on-artificial-intelligence-and-data-science-conversion-courses-now-open-to-applicants .

[46] https://www.gov.uk/world/uk-joint-delegation-to-nato.

[47] https://www.gov.uk/government/news/23-million-to-boost-skills-and-diversity-in-ai-jobs.

[48] "The UK and AI," [Online]. Available: https://www.europarl.europa.eu/RegData/etudes/ATAG/2024/762285/EPRS_ATA(2024)762285_EN.pdf.

[49] "UK AI Council," [Online]. Available: https://assets.publishing.service.gov.uk/media/5ff3bc6e8fa8f53b76ccee23/AI_Council_AI_Roadmap.pdf.

[50] "Responsible AI," [Online]. Available: https://rai.ac.uk/about-us/ .

[51] "MBRIF," [Online]. Available: https://mbrif.ae/.

[52] https://ai.gov.ae/wp-content/uploads/2021/07/UAE-National-Strategy-for-Artificial-Intelligence-2031.pdf.

[53] U. A. I. Office. [Online]. Available: https://ai.gov.ae/strategy/.

[54] "UAE Summer Camp," [Online]. Available: https://ai.gov.ae/.

[55] https://ai.gov.ae/ai-program/.

[56] "Dubai Blockchain Strategy," [Online]. Available: https://www.digitaldubai.ae/initiatives/blockchain.

[57] https://www.digitaldubai.ae/initiatives/ai-lab.

[58] "Smart Dubai Internet of Things Strategy," [Online]. Available: https://iot.xische.com/#:~:text=The%20Smart%20Dubai%20Internet%20of,business%20owners%20and%20public%20officials..

[59] "AI Sea-Cage Aquaculture," [Online]. Available: https://www.arnnewscentre.ae/en/news/uae/abu-dhabi-launches-ai-sea-cage-aquaculture-project/.

[60] "Benin's AI Strategy," [Online]. Available: https://www.afro-impact.com/benin-adopts-a-national-artificial-intelligence-strategy/.

[61] https://www.d4daccess.eu/en/benin-national-artificial-intelligence-and-big-data-strategy.

[62] "Benin National AI Strategy," [Online]. Available: https://numerique.gouv.bj/assets/documents/national-artificial-intelligence-and-big-data-strategy-1682673348.pdf.

[63] "Benin-Canada AI Collaboration," [Online]. Available: https://www.wearetech.africa/en/fils-uk/news/public-management/benin-and-canada-explore-ai-collaboration-to-boost-digital-economy.

[64] "Responsible AI Governance," [Online]. Available: https://www.dataphyte.com/latest-reports/nigeria-trails-benin-senegal-in-responsible-ai/.

[65] "Customs System Modernization," [Online]. Available: https://www.actuia.com/english/benin-adopts-custom-webb-an-ai-based-solution-for-its-customs-system/.

[66] "AU Deployment by MTN Benin 1," [Online]. Available: https://www.telecomreviewafrica.com/articles/telecom-operators/3146-benin-based-mtn-deploys-ai-and-ml-solutions/.

[67] "AI Deployment by MTN Benin 2," [Online]. Available: https://developingtelecoms.com/telecom-technology/oss-service-management/14365-mtn-benin-and-ericsson-address-throughput-issues.html.

[68] "AI Focused on Local Languages," [Online]. Available: https://www.wearetech.africa/en/fils-uk/news/benin-launches-initiative-to-develop-ai-focused-on-local-languages.

[69] "AI and Big Data Initiatives," [Online]. Available: https://www.intracen.org/news-and-events/news/benin-paves-the-way-for-ai-and-big-data-with-senia.

[70] "Benin Multimodel Ai Hackathon," [Online]. Available: https://lablab.ai/event/benin-multimodal-ai-hackathon.

[71] "Government launches £1.5 million AI programme for reducing carbon emissions," [Online]. Available: https://www.gov.uk/government/news/government-launches-15-million-ai-programme-for-reducing-carbon-emissions.

[72] https://www.ofgem.gov.uk/energy-policy-and-regulation/policy-and-regulatory-programmes/artificial-intelligence-ai-within-energy-sector

[73] https://www.imda.gov.sg/about-imda/emerging-technologies-and-research/green-computing

[74] https://www.ema.gov.sg/news-events/news/media-releases/2023/leveraging-digital-solutions-to-future-proof-singapore-energy-grid

[75] https://www.skillsfuture.gov.sg/

[76] https://www.ncss.gov.sg/docs/default-source/ncss-documents-and-forms/tech-and-go/industrydigitalplanforsocialservices.pdf

[77] https://www.openaccessgovernment.org/uk-government-invests-1-73-million-in-ai-projects-to-drive-green-transition/175538/#:~:text=The%20UK%20government%20has%20allocated,to%20a%20net%2Dzero%20economy.

[78] https://www.bankofengland.co.uk/research/fintech/ai-public-private-forum

[79] https://u.ae/en/about-the-uae/strategies-initiatives-and-awards/strategies-plans-and-visions/environment-and-energy/the-uae-net-zero-2050-strategy

[80] https://www.mbrsic.ae/en/about/mohammed-bin-rashid-al-maktoum-solar-park/

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