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Policy Brief

# Harnessing AI for ASEAN's Future: Governance, Adoption, and Sustainability under the DEFA

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**Key Messages:**

- Only six ASEAN Member States (AMS) have explicit artificial intelligence (AI) strategies, creating regional fragmentation in governance, data protection, and ethical safeguards.
- Fragmented policies and a lack of interoperable datasets hinder AI innovation and cross-border collaboration in ASEAN.
- AI-ready data centres are energy-intensive, requiring policies that support green data infrastructure and sustainable AI deployment.
- The ASEAN Digital Economy Framework Agreement (DEFA) offers a platform to harmonise AI policies, align regional AI governance with global standards, and facilitate responsible AI adoption across AMS.
- ASEAN should incorporate adaptable AI frameworks in the DEFA; expand AI-focussed capacity-building programmes in AMS; promote AI adoption amongst micro, small, and medium-sized enterprises; develop culturally diverse datasets; and incentivise sustainable AI infrastructure.

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Artificial intelligence (AI) presents transformative opportunities for ASEAN, as its market is projected to reach US$30.30 billion by 2030. AI adoption is expected to contribute 10%–18% of ASEAN's gross domestic product, benefiting key sectors such as manufacturing, health care, and energy. However, AI integration also highlights challenges, including governance gaps, disparities in AI readiness amongst ASEAN Member States, data governance issues, and sustainability concerns. While ASEAN has made progress through initiatives like developing the *ASEAN Guide on AI Governance and Ethics*, policy fragmentation and uneven AI adoption across ASEAN Member States underscore barriers to inclusive growth. The ASEAN Digital Economy Framework Agreement (DEFA) provides an opportunity to align AI governance in ASEAN with global standards, ensuring a regulatory framework that balances innovation with accountability. This brief highlights AI's role in ASEAN's digital economy and proposes policy recommendations to strengthen AI governance; enhance the population's digital skills; support AI adoption amongst micro, small, and medium-sized enterprises; promote culturally diverse datasets; and advance sustainable AI infrastructure. By fostering regional cooperation and embedding AI-related commitments into the DEFA, ASEAN can harness AI's potential while actively mitigating its risks.

The artificial intelligence (AI) market in ASEAN – projected to reach US$8.92 billion by 2025 and US$30.30 billion by 2030[1] – presents vast opportunities for the region's digitally engaged population and increasing AI investments (E-DISC, 2024; Google, Temasek, Bain & Company, 2024). However, AI integration also brings a host of challenges, ranging from regulatory and ethical concerns to skills gaps, data governance issues, environmental impacts, and infrastructure disparities. If not addressed, these challenges could widen the digital divide within the region.

ASEAN's diverse economic landscape and growing AI initiatives create a unique opportunity to bridge these gaps. By aligning regional and international AI governance frameworks, ASEAN can ensure a balanced approach that not only fosters innovation but also upholds accountability (WTO, 2024). The ASEAN Digital Economy Framework Agreement (DEFA) can play a role in this process, offering a platform for regional cooperation and the harmonisation of AI policies. This brief examines the opportunities and challenges of AI in ASEAN and presents policy recommendations to ensure that AI integration supports sustainable and inclusive growth.

## AI Opportunities for ASEAN

AI is estimated to contribute 10%–18% of ASEAN's GDP by 2030, translating to nearly US$1 trillion. Key sectors poised to benefit include manufacturing, where AI enhances efficiency through automation and predictive

[1] Statista, Artificial Intelligence – ASEAN, https://www.statista.com/outlook/tmo/artificial-intelligence/asean#market-size

maintenance; retail and health care, where it enables personalised recommendations and diagnostics; and agriculture, where it optimises crop yields and reduces food waste (Isono and Prilliadi, 2023a, 2023b; Kearney and EDBI, 2020).

Beyond economic benefits, AI is transforming public services. With ASEAN's urban population set to grow from 280 million to 370 million persons by 2030, AI-driven smart cities can improve traffic and urban planning. AI can also facilitate personalised learning in education and enhance health care accessibility and diagnostics (Kearney and EDBI, 2020).

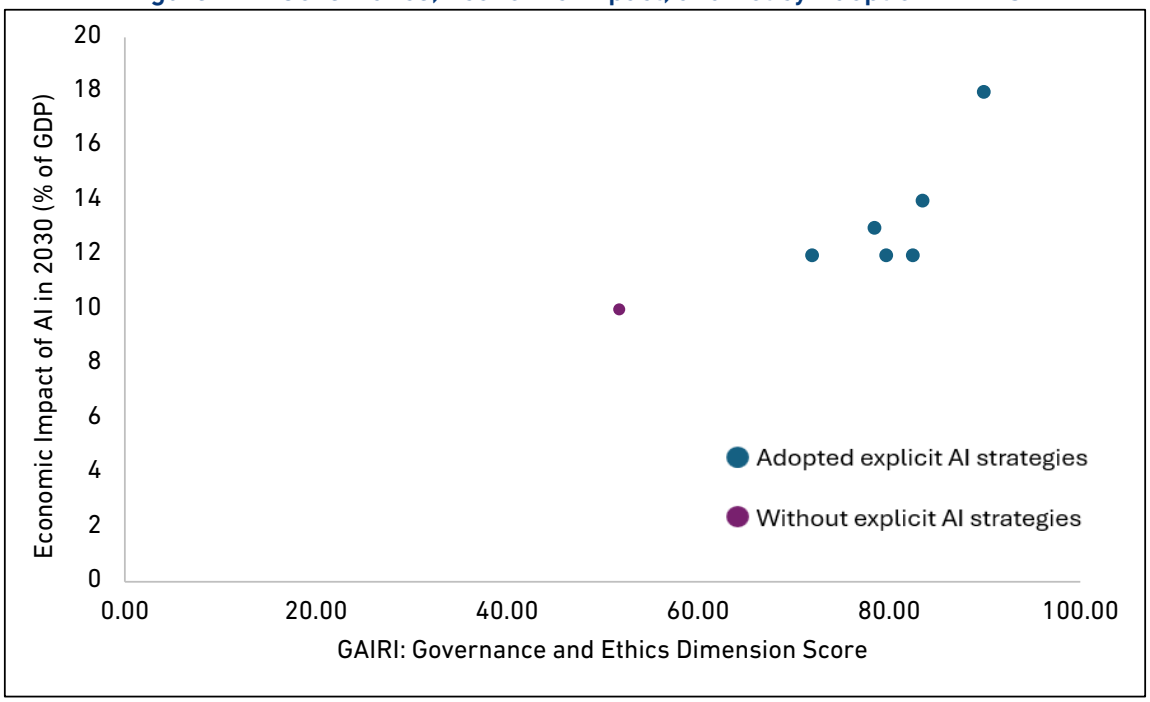
In addition, AI is crucial to energy management and sustainability. As ASEAN's energy demand rises, AI-powered smart grids help balance supply and demand and integrate renewable energy sources. These innovations enhance energy efficiency and support sustainability goals (Aljarrah, 2024).

## Challenges to AI Integration in ASEAN

### 1. Governance Gaps

A harmonised AI governance framework across the region is essential for a coordinated response to AI-related challenges. Currently, only six ASEAN Member States (AMS) have explicit AI strategies, while others rely on broader digital policies with limited AI focus. This disparity leaves algorithmic bias, data governance, and cybersecurity risks inadequately addressed. The figure below illustrates that AMS with dedicated AI strategies score higher in the governance and ethics dimension of the Government AI Readiness Index (GAIRI) and are projected to experience greater economic benefits from AI. While governance and ethics are not the only factors, they highlight how national AI policies enhance governance capacity and ensure that AI systems are deployed responsibly to support economic potential.

**Figure 1. AI Governance, Economic Impact, and Policy Adoption in AMS**




AI = artificial intelligence, GAIRI = Government AI Readiness Index, GDP = gross domestic product.
Sources: Kearney and EDBI (2020), Oxford Insights (2024).

At the regional level, ASEAN is advancing AI governance through initiatives like the 2024 *ASEAN Guide on AI Governance and Ethics* and an expanded version for generative AI[2] to establish principles for responsible AI deployment (ASEAN Secretariat, 2024). Complementing these efforts, the *ASEAN Responsible AI Roadmap (2025–2030)* was developed to provide actionable steps for policymakers and stakeholders to foster an enabling environment for responsible AI in the region (ASEAN Secretariat, 2025). By offering step-by-step guidance on foundational policy and regulatory factors as well as targeted actions tailored to the specific needs and capabilities of each AMS, the roadmap ensures a structured and sustainable approach to AI operationalisation throughout the region. It aligns with ASEAN's broader AI governance framework, reinforcing ongoing work such as the upcoming Guidelines on Responsible Development and Use of Generative AI and the *ASEAN Guide on AI Governance and Ethics*. The ASEAN Committee on Science, Technology, and Innovation

[2] Generative AI differs from traditional AI by creating new content (e.g. text, images, or videos) rather than simply analysing data. While traditional AI focusses on specific tasks like predictions or classifications, generative AI can use diverse data to create outputs for multiple applications. Its ability to produce innovative and sometimes unexpected results highlights its versatility compared to traditional AI's single-purpose focus (Gonzalez et al., 2024).

(COSTI) will further consolidate AI initiatives and build regional capacity, working closely with ASEAN dialogue partners, while the Working Group on AI Governance will work to address algorithmic transparency, ethical risks, and generative AI governance.

To ensure consistency, ASEAN and AMS must align their AI policies with international standards to reduce fragmentation, facilitate cross-border trade, and lower operational costs for businesses. The *Recommendation on the Ethics of AI* of the United Nations Educational, Scientific, and Cultural Organization (UNESCO) promotes transparency, accountability, and privacy to uphold human rights and sustainable development (UNESCO, 2021). The AI Principles of the Organisation for Economic Co-operation and Development (OECD) emphasise trustworthy, risk-based governance as well as cross-border cooperation towards AI,[3] while the G20 AI Principles advocate for human-centric AI to foster economic growth while ensuring ethical safeguards. By integrating these frameworks, ASEAN can improve its policy coherence towards AI as well as cross-border collaboration; the DEFA can play a role in embedding these principles into ASEAN's AI policies to ensure adaptive and globally aligned regulations.

### 2. AI Readiness Gaps and Adoption Challenges

While ASEAN's potential for AI adoption is vast, the region also faces gaps in AI readiness. Singapore leads with strong governmental support and infrastructure, while less-developed AMS face gaps in infrastructure, skills, and AI ecosystems (Oxford Insights, 2024). Talent shortages and workforce mismatches are further slowing AI adoption in many AMS, raising concerns about job displacement.

Beyond workforce challenges, AI adoption remains low amongst micro, small, and medium-sized enterprises (MSMEs) and start-ups. The primary barriers are high costs, technical complexities, and a lack of expertise. These constraints prevent such smaller businesses from fully leveraging AI's potential (Oikawa et al., 2024).

### 3. Data Governance Issues

Inconsistent policies, poor interoperability, and fragmented datasets also hinder AI innovation in ASEAN, complicating data harmonisation and security (ASEAN, 2024). These challenges are compounded by the limited availability of diverse datasets that reflect the region's vast cultural, linguistic, and socio-economic diversity. Without such datasets, AI applications may fail to address localised needs, reducing their relevance and effectiveness.

### 4. Data Centres and Sustainability

AI expansion is vastly increasing the energy consumption of data centres. In Singapore, data centres accounted for 7% of electricity use, which is expected to rise to 12% by 2030 (FEBIS, 2024). Meanwhile, investments in AI-ready data centres in ASEAN have exceeded US$50 billion, with major commitments in Malaysia (US$25 billion), Thailand (US$8 billion), and Singapore (US$9 billion) (E-DISC, 2024; Google, Temasek, and Bain & Company, 2024). As AI continues to grow, it is crucial to balance growth with sustainability. ASEAN must scale up green data centres and renewable energy to support AI expansion while maximising investment returns.

## AI in Trade and Digital Economy Agreements

AI provision in regional trade agreements and digital economy agreements reflect AI's growing importance. Agreements such as the United Kingdom (UK)–Australia free trade agreement (FTA), UK–Ukraine digital trade agreement, and the Korea–Singapore digital partnership agreement feature non-binding clauses promoting AI governance frameworks for trusted and responsible AI use (Government of the UK and Government of Australia, 2024; Government of the UK and Government of Ukraine, 2024; Government of South Korea and Government of Singapore, 2006).

Such provisions emphasise risk-based, outcome-based approaches, technological neutrality, international cooperation, and algorithmic transparency. The UK–Australia FTA addresses cooperation in international standards and governance frameworks, while the UK–Ukraine digital trade agreement and Korea–Singapore digital partnership agreement focus on information exchange, research, and good practices. The UK–Australia FTA and UK–Ukraine digital trade agreement also promote trade in emerging technologies and participation in international fora to align trade and technology.

Several FTAs link AI to trade facilitation. For example, the UK–Australia FTA acknowledges AI's role in enhancing competitiveness and enabling international trade. Similarly, digital trade provisions – which encompass data flow, data localisation, personal information protection, and source code disclosure – are crucial to AI development.

Disciplines on trade in services also influence governments' AI-related policies. Regional trade agreements generally offer greater market access and national treatment commitments than the World Trade Organization's General Agreement on Trade in Services (GATS) across supply modes and services sectors, including AI-related services. For instance, most World Trade Organizations members in Europe, the Middle East, North America, Latin America, and Asia have market access commitments for data-processing services under the GATS and/or various regional trade agreements (WTO, 2024).

ASEAN can draw lessons from these provisions to shape AI-related commitments under the DEFA. By promoting adaptable governance frameworks, encouraging international collaborations, and leveraging suitable regulatory approaches, ASEAN can address challenges while ensuring that AI supports regional integration and inclusive growth.

[3] OECD, AI Principles, https://www.oecd.org/en/topics/sub-issues/ai-principles.html#:~:text=The%20OECD%20AI%20Principles%20promote,stand%20the%20test%20of%20time

## Policy Recommendations

To address the challenges of AI integration in ASEAN, the following recommendations are proposed:

- The DEFA should include flexible, forward-looking AI and emerging technology frameworks grounded in ethical principles, ensuring alignment with global standards while fostering responsible AI use and adaptability.
- ASEAN should strengthen cooperation with dialogue partners[4] to launch regional AI-focussed capacity-building initiatives for public and private sector employees as well as partnerships with academia to integrate AI into curricula. Targeted efforts should prioritise underserved groups and less-developed AMS to bridge regional skill gaps.
- AMS should establish AI adoption programmes for MSMEs, including AI upskilling initiatives in collaboration with universities and industry. AMS should provide financial incentives and support (e.g. tax benefits and grants) and regulatory sandboxes that allow MSMEs to experiment with AI applications in a controlled environment.
- ASEAN should develop policies promoting culturally and linguistically diverse datasets. Initiatives like Singapore's National Multimodal Large Language Model Programme and Thailand's ThaiLLM can serve as models.
- ASEAN should offer fiscal incentives and strengthen public–private partnerships to advance green technologies, such as smart grids and green data centres, while building the technical capacity for responsible AI deployment.

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[4] More details on digital cooperation with dialogue partners can be found in ASEAN (2025).




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