

ASEAN Digital Outlook

Shaping a Secure, Inclusive, and Resilient Digital ASEAN



one vision
one identity
one community

ASEAN Digital Outlook

The Association of Southeast Asian Nations (ASEAN) was established on 8 August 1967. The Member States of the Association are Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand, Timor-Leste, and Viet Nam.

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ASEAN: A Community of Opportunities for All

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This Digital Outlook provides an overview of current developments, key challenges, and priority actions to support a secure, inclusive, and resilient digital ecosystem across the region.

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and Resilient Digital ASEAN

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Executive Summary

ASEAN continues to advance its digital transformation in line with the ASEAN Digital Masterplan (ADM) 2025 and the ASEAN Community Vision 2045. Progress over recent years has been marked by expanded digital connectivity, stronger regional coordination, and increasing adoption of emerging technologies, including artificial intelligence (AI). This Digital Outlook provides an overview of current developments, key challenges, and priority actions to support a secure, inclusive, and resilient digital ecosystem across the region.

ASEAN continues to strengthen its digital resilience by **fostering cybersecurity governance** and digital literacy as mutually reinforcing pillars of regional digital transformation. The region demonstrates strong leadership through several ASEAN Member States with mature digital security frameworks, alongside expanding regional efforts to address cross-border cyber risks arising from rapid digitalisation, including AI-generated threats, data breaches, cyberattacks, online misinformation, and scams. In response, ASEAN is significantly enhancing its cybersecurity resilience through a substantial expansion of regulations, policies, and initiatives—projected to increase by 67 per cent—reflecting a strategic shift toward proactive, multi-layered digital governance across all five layers of cybersecurity: physical, network, application, data, and human and organisational. This approach is further supported by strengthened regional coordination to enhance safety, trust, and preparedness across the ASEAN digital ecosystem.

At the same time, ASEAN is **advancing digital and AI literacy** as a critical enabler of inclusive and sustainable digital development. From the perspective of citizens, including educators and learners, the adoption of digital technologies and AI presents strong opportunities to enhance learning outcomes, creativity, and engagement, while continued efforts to improve access, guidance, and inclusive support—particularly for rural communities and vulnerable groups—remain important. From the perspective of industry, digital and AI literacy initiatives are most effective when they are scalable, workforce-relevant, and embedded within cross-sector ecosystems that align skills development with labour market needs. Moving forward, a coordinated, multi-actor

approach that brings together policy leadership, educational institutions, industry participation, and community-based delivery will further strengthen cybersecurity readiness and digital literacy in line with the **ADM 2025** and the **ASEAN Community Vision 2045**, supporting a safer, more inclusive, and future-ready ASEAN digital ecosystem.

A human-centred approach to digital transformation is increasingly shaping ASEAN's policy and programme implementation, recognising that digital and AI technologies deliver development impact only when anchored in literacy, inclusion, and trust. **Lessons learnt from the ASEAN Foundation's regional initiatives highlight that digital and AI literacy must form the foundation of this transformation, supported by economic empowerment pathways and robust cybersecurity as core public service functions.** These experiences demonstrate an integrated model in which digital skills development enables sustainable livelihoods—particularly for Micro, Small, and Medium Enterprises (MSMEs) and youth—while online safety, ethical technology use, and digital wellbeing maintain public confidence in digital systems. Collectively, this approach underscores that ASEAN's digital readiness is not solely a technological challenge but a governance and human capital imperative critical to strengthening social cohesion, economic resilience, and long-term regional competitiveness.

Analysis of the **Gartner's Hype Cycle** indicates that digital innovations across ASEAN are **advancing at varying stages of maturity**, from early experimentation to widespread adoption, underscoring the importance of strategic prioritisation. While early-stage technologies require continued investment in research and innovation, and high-visibility applications call for policy guidance to support productive deployment, a growing group of scaling and mature technologies—including cloud and data centres, green and AI-ready infrastructure, digital payments and open finance, cybersecurity solutions, and industrial Internet of Things (IoT)—are delivering measurable economic value and underpinning ASEAN's digital economy. Collectively, these dynamics highlight the need for a calibrated policy and investment approach that aligns innovation maturity with economic impact, ensuring that digital transformation strengthens regional resilience, inclusivity, and long-term competitiveness.

CHAPTER 1 Foreword:

ASEAN Digital Outlook

A Vision for Inclusivity and Sustainability

Over the past 5 years, ASEAN has made significant strides in digital infrastructure, policy harmonisation, and cross-border collaboration, reflecting the ADM 2025 vision:

“leading digital community and economic bloc, powered by secure and transformative digital services, technologies, and ecosystem”.

These efforts not only underscore ASEAN's commitment to bridging the digital divide but also highlight the resilience and adaptability of the region amidst global challenges.¹

The ADM 2025 is structured around three key pillars. The first emphasises the importance of high-quality, widespread connectivity, which relies on robust telecommunications infrastructure. Reliable, fast, and ubiquitous access is essential for enabling digital services, requiring both upgrades in already connected areas and the expansion of networks to underserved and unserved regions. The second pillar focuses on ensuring that digital services are safe, trustworthy, and responsive to the needs of users, thereby strengthening the confidence of ASEAN consumers and businesses. The third addresses adoption, highlighting the need to remove barriers by enhancing digital skills for businesses to improve productivity, promoting basic digital literacy among consumers, and ensuring affordable internet access. By improving skills, accessibility, and inclusivity, ADM 2025 aims to foster a more vibrant and equitable digital ecosystem across the region.

To support these ambitions, several regulations have been introduced at both regional and national levels to ensure the digital transformation is inclusive, secure, and sustainable. At the regional level, ASEAN is currently negotiating frameworks such as the ASEAN Digital Economy Framework Agreement (DEFA) and adopted. DEFA aims to **accelerate ASEAN's transformation into a leading digital economy that fosters greater digital cooperation and paves the way for regional digital integration and inclusive growth and development.**

ASEAN envisions significant growth in its digital economy from USD 300 billion to USD 1 trillion by 2030, guided by DEFA's comprehensive strategic roadmap structured around nine core elements,² beyond being just an economic agreement.³ Central to DEFA is fostering integration across member states. Currently, ASEAN's digital landscape is varied, with some countries advancing in digital finance and infrastructure, while others are still building foundational systems. Without unified digital rules and standards, this diversity could lead to fragmentation.⁴

The stakes for successful integration are high. Recent economic modeling suggests that a high-ambition DEFA could be a transformative engine for the region, potentially unlocking an additional USD 77 billion in annual services exports and boosting intra-regional trade in goods by as much as USD 326 billion.⁵ This integration is particularly vital for the region's MSMEs; by ensuring the seamless cross-border flow of data, DEFA would safeguard approximately USD 65–87 billion in annual value creation that these smaller firms derive from accessing regional market insights.⁶

Conversely, the failure to harmonise presents a stark economic risk. The region has seen a 300 per cent increase in digital regulations over the past five years, creating a fragmented landscape that acts as a tax on innovation.⁷ Without the regulatory coherence provided by DEFA, the proliferation of data localisation mandates and divergent compliance standards could impose USD 68 billion in avoidable trade costs, effectively putting the brakes on the region's digital momentum.⁸ By locking in interoperable standards and preventing discriminatory treatment of digital products, DEFA does not merely connect markets; it secures the foundation for ASEAN's projected USD 1 trillion digital economy.

1. ASEAN Digital Masterplan (ASEAN, 2025)

2. ASEAN Digital Economy Framework Agreement (ASEAN, 2023)

3. DEFA (The Asean Magazine, 2025)

4. Why ASEAN's new Digital Economy Framework Agreement is a game-changer (World Economic Forum, 2025)

5. ASEAN DEFA: Estimating the impacts of key DEFA digital trade provisions on ASEAN firms, trade, and economies (Nextrade Group, 2024), at p. 4.

6. Ibid

7. Toward better digital rules: Improving regulatory impact assessments and digital policymaking in the Asia-Pacific (Hinrich Foundation and Nextrade Group, 2025) at p. 3.

8. ASEAN DEFA: Estimating the impacts of key DEFA digital trade provisions on ASEAN firms, trade, and economies (Nextrade Group, 2024), at p. 12.

Table 1. Current conditions of digital regulations and initiatives at both the regional and national levels

	OVERALL POLICY	REGULATORY FRAMEWORK	AI POLICY/INITIATIVES
Regional level	• DEFA • ADM 2025 • ASEAN Cybersecurity Cooperation Strategy 2021–2025	• ASEAN Agreement on Electronic Commerce • ASEAN Framework on Digital Data Governance • ASEAN Framework on Personal Data Protection • ASEAN Framework on Consumer Protection in E-Commerce	• ASEAN Guide on AI Governance and Ethics • Expanded ASEAN Guide on AI Governance and Ethics–Generative AI • ASEAN Working Group on AI Governance • ASEAN Responsible AI Roadmap (2025–2030) • ASEAN AI Safety Network • AI Ready ASEAN
Brunei Darussalam 	The Digital Economy Masterplan 2025 outlines Brunei Darussalam's strategy to achieve Smart Nation status by accelerating digital transformation and strengthening socio-economic growth.	• Consumer Protection Order 2001 (includes digital contexts) • Electronic Transactions Order 2006 • Computer Misuse Order 2011 • Personal Data Protection Order, 2025 • Telecommunications Order, 2001 • Postal Services Act, Chapter 271 • Computer Misuse Order, 2011 • Broadcasting Act, Chapter 180 • Electronic Transactions Act, Chapter 196 • Cybersecurity Act, Chapter 272	• National Data and AI Strategy; AI Governance Guide; • Digital Economy Masterplan
Cambodia 	ICT Development Masterplan Focus on expanding broadband, enhancing e-government, developing infrastructure in digital technologies.	• Consumer Protection Law (2019) includes some digital aspects • Law on Electronic Commerce and Electronic Transactions (2019) • Law on Suppression of Computer Crime (2010) • Draft Personal Data Protection Law (pending)	• National AI Priority: Human capital, AI law, AI professions, AI-literate citizens; • MPTC leads AI Training Center with UNESCO 2025 • Khmer text-to-voice
Indonesia 	Visi Indonesia Digital 2045 is defined as a long-term digital planning concept that provides vision, mission, targets and strategies for digital development to realise Indonesia Emas 2045.	• e-KTP law: Law No. 23/2006 on Population Administration (eID basis)–amended by Law 24/2013 • Consumer Protection Law No. 8/1999 (digital commerce included) • Law No. 11/2008 on Electronic Information and Transactions (EIT Law)–amended by Law 19/2016 • Law No. 19/2016 (Amendment to EIT Law) and Law No. 44/2008 (Cybercrime in EIT Law) • Government Regulation No. 71/2019 on Personal Data Protection • PDP Law 27/2022	• National Workplan on AI MoE, youth focus); • Coding and AI as an optional subject (elementary–high school) • The White Paper on the National Artificial Intelligence Roadmap • Circular Letter Number 9/2023 on Indonesia's AI ethics guidelines
Lao PDR 	The National ICT Strategy emphasises broadband network expansion and digital literacy programmes.	• Law on Protection of Consumers 2010 (digital aspects limited) • Draft Electronic Transactions Law (development phase) • Cybercrime legislation (draft or limited) • Draft Data Protection Law (under development)	• National AI Strategy MoTechComm + MoES • ICT Competency Standard 2022, 10-year plan to 2035; five year Education Action Plan
Malaysia 	National Digital Network (JENDELA) National initiative to increase broadband coverage and develop digital infrastructure, including 5G.	• National Registration Identity Card Act 1990 (digital ID MyKad integrated) • Consumer Protection Act 1999 (includes online/digital protection) • Digital Signature Act 1997 and Electronic Commerce Act 2006 • Computer Crimes Act 1997 and Cybersecurity Act • Personal Data Protection Act 2010	• AI untuk Rakyat • ADAX/Data Star by CADS (MDEC) • ADAX/Data Star in partnership with Coursera • AIForMYFuture by Microsoft • AI-powered Classroom MoE x Huawei, Samsung, Google, PPP • DELIMA learning platform • MyDIGITAL AI untuk Rakyat • Digital Competency Score • 1.0 2.0 with AI • AI Roadmap and 4IR Policy emphasise building local AI capabilities via public-private collaboration.

Table 1. Current conditions of digital regulations and initiatives at both the regional and national levels

	OVERALL POLICY	REGULATORY FRAMEWORK	AI POLICY/INITIATIVES
Myanmar 	Myanmar Digital Economy Roadmap Inclusion of broadband expansion, Information and Communication Technology (ICT) infrastructure investment and e-government enhancements.	• Consumer Protection Law 2019 (digital protection emerging) • Electronic Transactions Law 2004 • Computer Science Development Law 1996 • Cybersecurity Law 2025 • AI integrity, security and safety as priority • Grassroots + policy alignment	• Teacher training multiplier effect • Social campaign
The Philippines 	Republic Act No. 12234, 24 August 2025, An Act Establishing A Comprehensive and Inclusive Data Transmission And Connectivity Framework for the Philippines, known as the “Konektadong Pinoy Act”, and its IRR. REPUBLIC ACT No. 10929, 25 July 2017 An Act Establishing the Free Internet Access Programme in Public Places in the Country and Appropriating Funds Therefor. National Broadband Plan Targets pervasive, affordable, and inclusive internet access with infrastructure improvements and regulatory reforms.	• Philippine Identification System Act 2018 (PhilSys digital ID system) • Consumer Act (RA 7394, 1992) with amendments for digital/child online protection • Electronic Commerce Act of 2000 • Cybercrime Prevention Act 2012 • Data Privacy Act 2012 • National Cybersecurity Plan (NCSP 2022) • Internet Transactions Act of 2023 • Anti-Financial Account Scamming Act (AFASA) of 2024 • DICT MC No. 005 on the protection of Critical Information Infrastructure (CII) under the NCSP 2022 • DICT MC No. 006: on the protection of government agencies under the NCSP 2022 • DICT MC No. 007: Deals with the protection of individuals under the NCSP 2022	• National AI Strategy NASAIR; • AI research centre in education (focus on health and wellness) • PPPs with Google, Microsoft, and Khan Academy • NPC Advisory 2024-04, 19 December 2024, GUIDELINES ON THE APPLICATION OF REPUBLIC ACT NO. 10173 OR THE DATA PRIVACY ACT OF 2012 (DPA), its implementing rules and regulations, and the issuances of the commission to artificial intelligence systems processing personal data
Singapore 	Smart Nation Strategy 2.0 a comprehensive programme for advanced digital infrastructure, smart technologies, and digital services.	• National Registration Act and SingPass digital ID ecosystem • Consumer Protection (Fair Trading) Act 2003 (includes online protection) • Electronic Transactions Act 1998 • Cybersecurity Act 2018 • Computer Misuse Act 1993 • Personal Data Protection Act 2012	• National AI Strategy 2.0 • Model AI Governance Framework • Model AI Governance Framework for Generative AI • EdTech Masterplan

Table 1. Current conditions of digital regulations and initiatives at both the regional and national levels

	OVERALL POLICY	REGULATORY FRAMEWORK	AI POLICY/INITIATIVES
Thailand 	Thailand's Digital Economy and Society Development Plan is a national strategy that aims to leverage digital technology to transform the country's economy and society by enhancing government services, strengthening business competitiveness, and improving citizens' digital literacy overall.	• Electronic Transactions Act B.E. 2544 (2001) • Computer Crime Act B.E. 2560 (2017) • Personal Data Protection Act B.E. 2562 (2019) • Cybersecurity Act B.E. 2562 (2019) • Computer-Related Crime Act B.E. 2550 (2007) and Amendments • Electronic Transactions Act B.E. 2544 (2001) and Amendments • Personal Data Protection Act B.E. 2562 (2019) • Royal Decree on Cyber Crime Prevention and Suppression B.E. 2566 (2023) • Electronic Payment Services Act B.E. 2560 (2017) • Consumer Protection Act B.E. 2522 (1979) and Amendments • Telecommunications Business Act B.E. 2544 (2001) and Amendments • Royal Decree on the Regulation of Digital Asset Business B.E. 2561 (2018)	• AI Thailand Strategy; 31 languages Thai, Chinese, English) • AI-powered lifelong learning • Teacher training
Viet Nam 	• Resolution No. 52-NQ/TW (2019) on proactive participation in the Fourth Industrial Revolution, identifying AI, IoT, big data, and cloud computing as priority technologies. • Resolution No. 57-NQ/TW (2024) positioning digital infrastructure, data, AI, and the digital technology industry as new strategic growth drivers. • National Digital Transformation Programme to 2025, vision 2030 (Decision 749/QĐ-TTg, 2020), built on three pillars: Digital Government – Digital Economy – Digital Society. • National Strategy for Digital Economy and Digital Society Development to 2025, vision 2030 (Decision 411/QĐ-TTg, 2022) • Broadband Development Programmes and a national 5G roadmap, aiming at near-universal high-speed broadband and extensive 5G coverage by 2030. National orientation for data centres and cloud computing, supporting digital government, AI, and platform-based services.	• Law on Identity Cards 2014 (digitised national ID) • Law on Electronic Transactions (2005) • Law on Information Security (2015) • Cybersecurity Law 2018 • Decree No. 13/2023 on Personal Data Protection (PDP) • Law on Consumer Protection Rights (2010, revised 2023) • Digital Technology Industry Law (effective 1 January 2026)	• National Strategy on Research, Development and Application of Artificial Intelligence to 2030 (Decision 127/QĐ-TTg, 2021) • Artificial Intelligence Law (effective 1 March 2026)

These regulatory and initiative efforts serve as critical building blocks for ASEAN's digital integration to build and connect. They build a foundation of digital resilience, equity, and ethical coherence, and they connect diverse member states into a unified, empowered ASEAN digital community, fully aligned with the vision of the ADM 2025.

Progress and Lessons

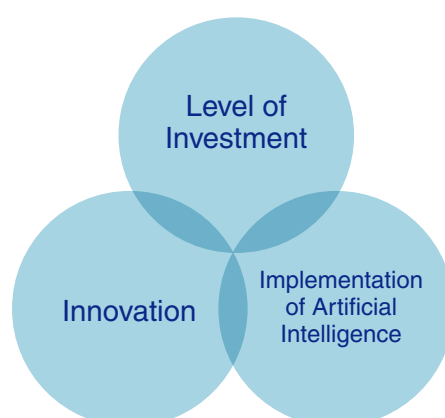
As part of its vision outlined in the ADM 2025, the ASEAN region aims to establish itself as a leading digital community and economy. Central to this ambition is the development and expansion of high-quality, reliable, and pervasive telecommunications infrastructure. The ADM 2025 Framework outlines eight strategic thrusts that serve as key pillars for regional digital transformation. One of the foundational components of this vision is Digital Connectivity and Infrastructure—enhancing accessibility, quality and affordability of infrastructure; next-generation infrastructure; universal design; and equitable access—which plays a critical role in enabling seamless digital integration and supporting economic growth across ASEAN Member States.

The performance of digital connectivity and infrastructure, both at the regional and national levels, can be assessed through key indices and desired outcomes. Under the ADM, Desired Outcomes 2 (DO2) prioritises upgrading fixed and mobile broadband through next-generation technologies to deliver faster, more reliable connectivity that fuels digital services, innovation, and productivity. Complementing this, DO8 promotes digital inclusion by ensuring individuals, communities, and MSMEs can access and effectively use digital tools, thereby boosting participation in the digital economy and strengthening ASEAN's competitiveness.

The Government AI Readiness Index (GAIRI) 2024, Data and Infrastructure pillar underscores the critical role of high-quality, representative data and robust infrastructure in unlocking the value of AI tools for citizens.⁹ The GAIRI data from 2021 to 2024 indicates an overall improvement in AI digital infrastructure across ASEAN countries. Brunei Darussalam, Malaysia, Singapore, and Thailand achieved the highest scores compared to other nations. Indonesia, the Philippines, and Viet Nam recorded average scores slightly below the regional benchmark. Cambodia, Lao PDR, and Myanmar consistently reported the lowest scores, all falling below the ASEAN average.

Progress in economic and innovation competitiveness is reflected in The Global AI Index by Tortoise, an index designed to benchmark countries based on their level of investment, innovation, and implementation of Artificial Intelligence.¹⁰ The index uses several pillars, including the innovation pillar, which is further divided into two sub-pillars: (1) research, which assesses the extent of specialist research and researchers, including the number of publications and citations in reputable academic journals, and (2) development, which focuses on the creation of fundamental platforms and algorithms that support innovative artificial intelligence projects.

The Global AI Index evaluates countries across three key dimensions.



Source: Tortoise

9. The Government AI Readiness Index (Oxford Insights, 2024)

10. The Global AI Index (Tortoise Media, 2024)

According to Tortoise's 2024 data on Innovation Pillars, ASEAN countries generally remain at the research stage rather than development. Some countries, such as Malaysia and Singapore,

rank above the ASEAN average, while the Philippines, Thailand, and Viet Nam consistently report the lowest rankings, all falling below the ASEAN average.

Table 2. Digital connectivity and infrastructure performance

Performance	AI		AI	
Source	GAIRI (2021)	GAIRI (2024)	Tortoise (2024)	Tortoise (2024)
Indicator	Data and Infrastructure pillar	Data and Infrastructure pillar	Innovation Pillar: Research	Innovation Pillar: Development
Unit	Score out of 100	Score out of 100	Rank out of 83 countries	Rank out of 83 countries
Purpose	For policy and governance benchmarking		For economic and innovation competitiveness	
ASEAN AVERAGE SCORES/RANK	61.04	66.86	45	50
Brunei Darussalam	74.23	74.62	Not available	Not available
Cambodia	44.87	51.40	Not available	Not available
Indonesia	60.40	69.64	24	71
Lao PDR	50.88	51.36	Not available	Not available
Malaysia	66.34	77.56	38	43
Myanmar	42.36	44.69	Not available	Not available
The Philippines	62.44	62.45	77	57
Singapore	85.80	93.14	3	5
Thailand	71.21	77.90	63	63
Viet Nam	51.87	65.86	67	58

Source: Oxford Insights (2021–24), Tortoise (n.d.)

Although disparities between countries often present a major challenge to advancing digitalisation, the data presented indicates that digital infrastructure at both regional and national levels performs reasonably well enough in building a foundation for digital resilience, equity, and ethical coherence, while also connecting diverse member states into a unified framework.

Moving forward, ADM must strategically **shift its focus toward promoting interconnected Digital Public Infrastructure (DPI) ecosystems, AI adoption, regional cybersecurity, sustainable infrastructure, and digital and AI literacy.** This includes placing particular emphasis on AI ethics, consumer protection, and reducing usage disparities to deliver immediate economic and social value.

This strategic pivot is reinforced by DEFA—the world's first legally binding regional digital economy agreement.¹¹ DEFA serves as a foundational framework for harmonised policies in areas such as e-commerce, cross-border data flows, cybersecurity, digital payments, and emerging technologies. DEFA offers a compelling framework to support ethical governance and responsible innovation across ASEAN. By promoting harmonised regulations, data protection standards, and shared technical protocols, DEFA can streamline cross-border while balancing innovation with privacy, security, and ethical safeguards.¹² It further emphasises digital skills development and research support to ensure the region's readiness for growth.

11. The ASEAN Digital Economy Framework Agreement (The Asean Magazine, 2024)

12. AI and the Digital Economy Framework Agreement: Preparing ASEAN for the Next Tech Wave (Competition Policy International, 2024)

Digital outlook of ASEAN: a foreword commitment

Infrastructure-related indicators are relatively easier to achieve because performance largely depends on network deployment by operators and their investment strategies. On the other hand, indicators related to usage and adoption rely more on consumer behaviour and tend to develop at a slower pace. These indicators also reflect a persistent usage gap: despite widespread availability of infrastructure, many people still do not use the internet, particularly people in vulnerable situations like children, first-time users, and people in rural areas.¹³ This underscores the growing importance of **high impact priorities**—interconnected DPI ecosystem, AI adoption, conducting regional cybersecurity, sustainable infrastructure, and digital and AI literacy—ensuring that connectivity translates into meaningful, safe, and informed use. For these users, addressing barriers such as digital literacy, online safety, and accessible content is just as critical as deploying infrastructure.

From infrastructure to adoption, our focus has shifted to developing digital and AI talent to ensure not only access and usage but also the responsible and impactful application of technology. Our goal is not only to get the access and use but also responsibly use it for common goods and solve regional issues (i.e. in high-tech agriculture/farming, health monitoring, inclusive education, and empowering rural areas).

CHAPTER 2

Digital ASEAN:

Local and Regional Digital Policy and Regulations Across ASEAN Member States on Cybersecurity

ASEAN's current cybersecurity and digital security performance in 2025 display both major progress and persistent risks, shaped by economic digitisation, regional cooperation, and evolving threats. It is reflected in policy, investment, and some high-performing “champion” countries—yet is undermined by major disparities in law, readiness, and resource allocation. Digital trust, skills development, regulatory coordination, and effective incident response are vital priorities for strengthening regional digital resilience and supporting ongoing economic growth.^{14,15,16,17,18,19}

ASEAN faces rising attack sophistication using AI-driven tools, deepfake scams, rapid proliferation of phishing, and attacks targeting hybrid work environments. Criminal organisations increasingly exploit regional regulatory inconsistencies and cross-border legal loopholes, especially where cyber workforce shortages prevent effective detection and response.^{14,16,17}

According to sectoral and user risks, new-to-digital users, SMEs, and unprotected sectors (e-commerce, fintech, and health) are most exposed. Digital financial services' growth has outpaced basic cyber hygiene, making social engineering and scam losses a key concern across the regional.^{14,15,16,19}

ASEAN digital security performance varies significantly across countries, reflecting differences in cybersecurity capabilities, data protection, and electronic infrastructure. The table summarises key performance indicators, including scores, ranks, and progress tiers, offering a comparative overview of regional strengths and ongoing challenges.

13. Measuring Digital Development – ICT Development Index 2025 (International Telecommunication Union, 2025)

14. Cisco Cybersecurity Readiness Index (Cisco, 2025)

15. Strengthening ASEAN's Cybersecurity (ERIA)

16. Cisco's 2025 Cybersecurity Readiness Index Finds Alarming Gaps (Cybersecurity Asia)

17. ASEAN Institute for Peace and Reconciliation (CyberCon2025 – Essay Publication)

18. Cybersecurity Threatscape in Southeast Asia (Positive Technologies)

19. Navigating Data Protection Laws in ASEAN-6 (ASEAN Briefing)

Table 3. Digital security performance

Performance	Digital				
Source	Digital Quality of Life Index (2025)		Network Readiness Index (2024)	ICT Development Index (2025)	Global Cybersecurity Index (2024)
Indicator	Digital Security	Digital Infrastructure	Governance Pillar	Overall Indicator ²⁰	Overall Pillar ²¹
Unit	Rank out of 121 countries		Rank out of 133 Countries	Score out of 100	Tier 1-4
ASEAN AVERAGE SCORES/RANK	80	57	57	84.4	2
Brunei Darussalam	Not available	Not available	Not available	93.6	Tier 3–Establishing (score of 55–85)
Cambodia	117	98	121	77.4	Tier 4–Evolving (score of 20–55)
Indonesia	74	74	69	84.7	Tier 1– Role-modelling (score of 95–100)
Lao PDR	105	95	129	69.7	Tier 4–Evolving (score of 20–55)
Malaysia	67	28	41	95.3	Tier 1– Role-modelling (score of 95–100)
Myanmar	Not available	Not available	Not available	69.7	Tier 3–Establishing (score of 55–85)
The Philippines	52	65	74	78.0	Tier 2–Advancing (score of 85–95)
Singapore	55	3	8	97.7	Tier 1– Role-modelling (score of 95–100)
Thailand	73	44	42	91.9	Tier 1– Role-modelling (score of 95–100)
Viet Nam	96	53	67	86.0	Tier 1– Role-modelling (score of 95–100)

Source: Surfshark (2025), Portulans Institute (2024), International Telecommunication Union (ITU) (2025), ITU (2024)

The analysis of table 3 reveals ASEAN Member States' current conditions of digital security performance. Digital security performance of the ten ASEAN member countries widely ranges, reflecting variations of technology advance, legal evolution, and national capability. These variations can only be widely classified into four levels, among which run “role-modelling” to “evolving”, to frame each nation's stage of maturity of digital security policy, infrastructure, and enforcement practice.

The six countries of Indonesia, Malaysia, Singapore, Thailand, the Philippines, and Viet Nam form the top tier because they possess complete legal

systems and skilled incident response teams and strong political backing for cybersecurity initiatives. The countries demonstrate their late-stage development through their adherence to international standards and their significant technical infrastructure spending and regular participation in worldwide cyber exercises and information-sharing activities. The countries have established national Computer Emergency Response Teams (CERTs), and they maintain updated data protection laws, and they support both private sector and citizen cybersecurity capacity development programmes. Their maturity of approach enables them to act in association with potential regions and, in some regards, globally.^{22,23,24,25}

20. (1) individuals using the Internet (per cent), (2) households with Internet access at home (per cent), (3) active mobile-broadband subscriptions per 100 inhabitants, (4) population covered by at least a 3G mobile network (per cent), (5) population covered by at least a 4G/LTE mobile network (per cent), (6) mobile broadband internet traffic per subscription (GB), (7) fixed broadband internet traffic per subscription (GB), (8) mobile data and voice high-consumption basket price (per cent GNI p.c.), (9) fixed-broadband Internet basket price (per cent GNI p.c.), (10) individuals owning a mobile phone (per cent).

21. (1) legal, (2) technical, (3) organisational, (4) capacity development, and (5) cooperation.

22. ASEAN Regional Forum Annual Security Outlook 2024, 6–13.

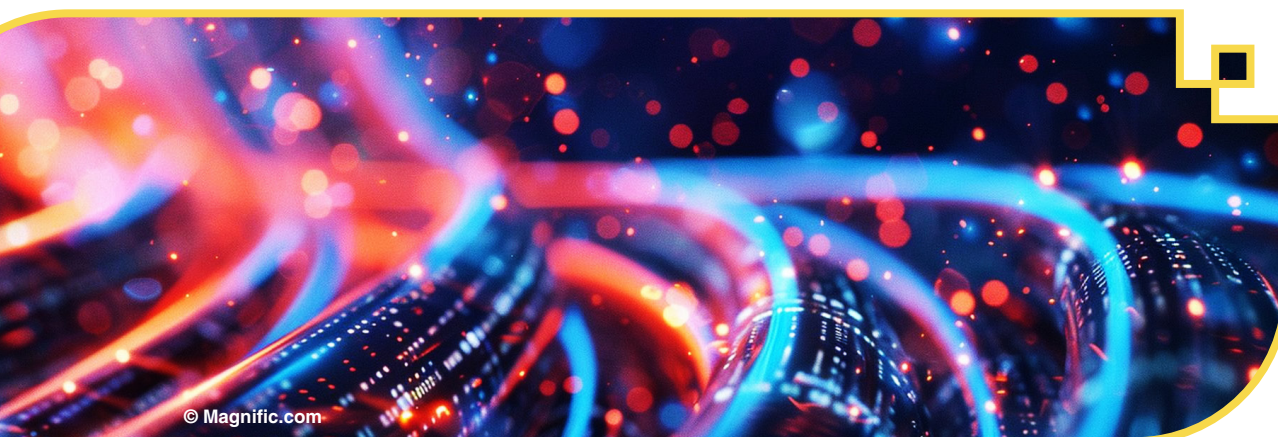
23. Cyber Public Health Report for the ASEAN Region, 13–18

24. Investing in ASEAN's Digital Economy: Risks and Opportunities, 7–11.

25. ASEAN Digital Community 2045, 4–7.

The “evolving” category includes Cambodia and Lao PDR as two countries. The main barriers for these countries stem from insufficient national strategies and weak legal frameworks and insufficient budgeting and poor enforcement capabilities. The countries face delays in their digital transformation because they receive international backing and regional agreements yet struggle with insufficient digital competencies and insufficient funding and slow-moving regulatory progress.^{22,23,24,25}

Brunei Darussalam maintains its basic frameworks, yet its international standing decreases because of infrastructure threats (ICT Development Index) and minimal policy development during recent years.^{23,24} For Myanmar, operational instability and legacy systems hinder sustainable digital security development. Myanmar, in particular, faces ongoing declines in global security rankings as open network resources remain exploitable and internal governance and monitoring mechanisms are not robust.²²



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Issues in Cybersecurity

As stated in the previous analysis, ASEAN faces significant challenges in cybersecurity, arising from rapid digitalisation, uneven regulatory frameworks, and rising cross-border threats. The region's diverse levels of technological development and security preparedness expose member states to manipulated media, data breaches, cyberattacks, online scams, and digital fraud, highlighting urgent needs for harmonised policy, stronger infrastructure, and coordinated regional action. The details on issues faced by ASEAN Member States are explained below.

Deepfakes, manipulated media, or AI-generated threats

According to key highlights from Sumsb's Q1 2024 verification and identity fraud data, Viet Nam was one of the countries with the most deepfakes detected in Q1 2024. Multiple growth in deepfakes is occurring in certain countries where elections are held in 2024, including Indonesia. Even in countries with no elections in 2024, deepfake-related cybercrimes are advancing at unprecedented rates year-over-year—this includes Viet Nam.²⁶ In addition, the Philippines has experienced the highest increase in deepfake cases, with a 4,500 per cent rise in deepfake-driven fraud between 2022 and 2023. However, Viet Nam accounts for the highest proportion of regional deepfake-related fraud incidents, making up more than 25 per cent of such cases.²⁷ Malaysia has also seen a significant 1,000 per cent increase in deepfake incidents in the same period.²⁸

22. ASEAN Regional Forum Annual Security Outlook 2024, 6–13

23. Cyber Public Health Report for the ASEAN Region, 13–18

24. Investing in ASEAN's Digital Economy: Risks and Opportunities, 7–11

25. ASEAN Digital Community 2045, 4–7

26. Deepfake Growth in the 2024 Election Year (Sumsb)

27. Deepfakes in Southeast Asia (Tech Collective, 2025)

28. Malaysia Must Lead ASEAN In Combating Deepfake Threats With Stronger Legal Protections (Data Protection Excellence Network, 2025)

Data breaches

Between 2023 and 2025, data breach incidents were recorded in several ASEAN Member States, including Indonesia, Thailand, and the Philippines. During this period, Indonesia reported a higher number of data breach cases compared to other ASEAN countries.²⁹ Indonesia also accounts for a large share of dark web listings associated with data breaches in the ASEAN region, reflecting the scale of reported incidents and related cyber activities during the period.

Thailand has seen a sharp increase in cyber incidents, with over 690,000 data leaks reported in Q3 2024, and financial phishing attacks ranking second highest in the region.³⁰ These breaches caused significant operational disruptions and triggered government-wide audits due to poor data backup practices. The Philippines and Thailand follow closely, with the Philippines faced major DDoS attacks and healthcare sector data breaches impacting government and private entities while Thailand suffering from a surge in ransomware and phishing attacks primarily targeting its manufacturing and financial sectors.³¹

Cyberattacks

Between 2023 and 2024, Thailand and Viet Nam collectively accounted for 25 per cent of all cyberattacks in the region, followed by the Philippines, Singapore, Indonesia, and Malaysia. The number of cyberattacks during 2024 concentrated on Indonesia, Thailand, and Singapore. The ASEAN region experienced its most severe cybersecurity threats during 2025 when Indonesia faced 3.64 billion cyberattacks from January through July, which included 83.68 per cent malware-based incidents.³² Indonesia's exposure to cyber threats is shaped by a range of structural and capacity-related factors, including the progressive development of its regulatory framework, evolving cybersecurity investment needs, varying levels of digital skills, and the ongoing strengthening of critical information infrastructure protection. Across ASEAN, Singapore, Thailand, and Viet Nam have also accounted for a substantial share of reported cyber incidents. Singapore represented 20 per cent, where a highly advanced digital ecosystem has been accompanied by a relatively higher incidence of ransomware-related attacks. Thailand represented 27 per cent of cases, reflecting the rapid digitalisation of critical sectors alongside continuing efforts to enhance digital literacy while Viet Nam accounted for 21 per cent of incidents.³³

Online Scams

According to the State of Scams in Southeast Asia 2025 report by The Global Anti-Scam Alliance (GASA), country-level rates were reported at 35 per cent in Indonesia, 73 per cent in Malaysia, 65 per cent in the Philippines, 66 per cent in Singapore, 60 per cent in Thailand, and 77 per cent in Viet Nam. Scammers most often use phone calls (62 per cent), text messages (56 per cent), and instant messaging apps (49 per cent) to contact victims. Scam payments are primarily made through wire transfers (48 per cent) and e-wallets (36 per cent). At the regional level, 73 per cent of victims reported scams to the payment service used to send money, but only 22 per cent were able to recover at least part of their funds. Financial recovery after reporting is more common in Singapore, where 43 per cent of victims were able to at least partly recover the money,³⁴ while in the Philippines, only 11 per cent of victims managed to recover any losses. GASA highlights that online scams go beyond being a consumer problem—they pose a significant threat to digital trust, economic stability, and personal safety. While governments often prioritise protecting critical infrastructure from cyberattacks, scams targeting consumers erode confidence in the digital economy. To effectively combat this issue, GASA recommends focusing on empowering consumers, creating a safer internet, and strengthening cooperation.³⁵

29. The Escalating Cyber Threat in Indonesia (Indo Sect, 2025)

30. Cybersecurity in APAC (Tech Wire Asia, 2025)

31. Cybersecurity threatscape in Southeast Asia (Global Ptsecurity, 2025)

32. Indonesia's BSSN Records 3.64 Billion Cyberattacks in First Half of 2025 (Tempo, 2025)

33. Cybersecurity threatscape in Southeast Asia (Global Ptsecurity, 2025)

34. the Singapore Police Force's Mid-Year Scam and Cybercrime Brief 2025

35. State of Scams in Southeast Asia 2025 Report (GASA, 2025)

Online misinformation and disinformation

Spread rapidly throughout ASEAN since digital technology merged with multiple media sources. Digital platforms and social media have been used by malicious actors to create false narratives that influence public opinion. False information spreads widely, harming democratic trust and preventing civic participation because it replaces accurate news with misleading content which silences opposing viewpoints. Efforts to counter misinformation may inadvertently place additional limitations on speech. The targeted spread of false information primarily harms marginalised groups because it strengthens social inequalities and blocks humanitarian resources while perpetuating discriminatory stereotypes. A rights-based solution to misinformation requires independent media support and algorithm changes to reduce harmful content spread.^{36, 37, 38}

Table 4. Challenges in misinformation identification

Cognitive barriers	Content complexities	Limited access to social media and limited exposure to digital platforms	General
	Language barriers		
	Dominant language proficiency		
Limited technological knowledge and skills	Limited fact-checking knowledge		General
	Limited access to technology		
	Limited digital literacy		
Emotional manipulation	Negative emotion		Indonesia, Malaysia, Myanmar, Thailand
	Fear-based information		
Complexity of information	Language barriers		Cambodia, Lao PDR
	Lack of dominant language proficiency		
	Barriers within multilingual society		
Vulnerabilities	Poverty		General
	Elderly		
	Special needs individuals		
	Rural residents		
	Refugees		
Emotional biases	Cultural sensitivities		Brunei Darussalam, Indonesia, Malaysia, Myanmar, Thailand
	Religious sensitivities		

Source: ASEAN Foundation (2024)

36. Disinformation as a weapon in Myanmar (Human Rights Myanmar, 2025)

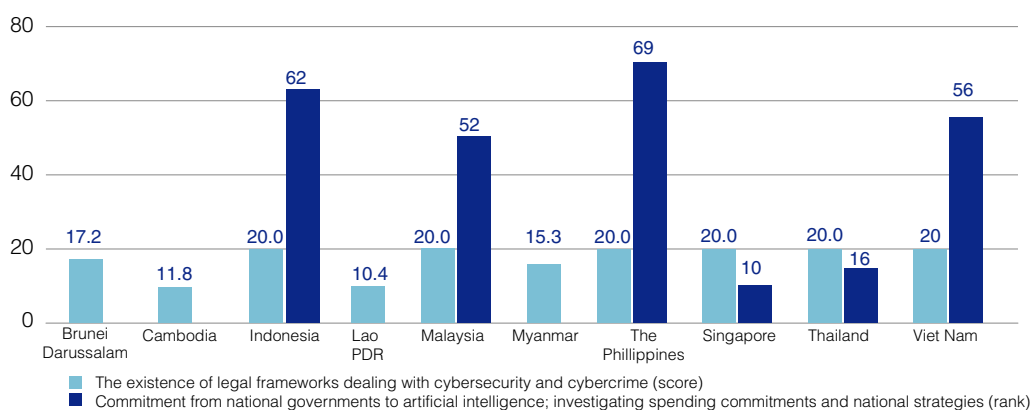
37. Regional Consultation on Freedom of Opinion and Expression in ASEAN (AICHR, 2023)

38. Dela Cruz et al., "CyberCon2025 - Essay Publication," 2025



Initiatives to prevent

ASEAN Member States have undertaken various efforts to prevent the recurrence of cybersecurity issues, one of which is through establishing a legal framework. Best on Global Cybersecurity Index (GCI) 2024, legal measures empower a state to implement fundamental response mechanisms, including criminalising certain acts, investigating and prosecuting crimes, imposing sanctions for offences, non-compliance, or breaches, and creating institutional frameworks to manage or oversee cybersecurity. A legislative framework provides the minimum foundation of acceptable behaviour upon which further cybersecurity capabilities can be developed. The primary goal is to have adequate legislation to harmonise practices at the regional and international levels, strengthen cybersecurity systems, and streamline international frameworks to combat cybercrime.

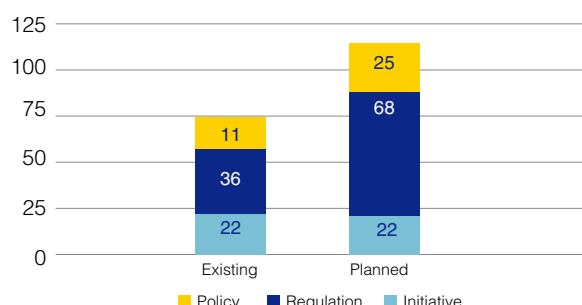


Note: Data for Brunei Darussalam, Cambodia, Lao PDR, and Myanmar are not available for assessing national governments' commitment to AI.

Figure 2. Initiative to prevent
 Source: ITU (2024), Tortoise (2024)

Strengthening cybersecurity resilience, ASEAN Member States have implemented and planned a combination of regulations, policies, and initiatives aimed at enhancing regional digital safety and trust. Governments are enacting new cybersecurity and data protection laws, updating existing acts, and drafting frameworks to address emerging risks such as AI misuse, online scams, and data breaches. Alongside these legal measures, strategic policies guide national cybersecurity development, digital trust, and resilience. Complementing them, operational initiatives—ranging from awareness programmes to inter-agency collaborations and international partnerships—enhance practical enforcement and public readiness against cyber threats.

During 2020–2025, there were 22 initiatives, 36 regulations, and 11 policies recorded—totalling 66 digital governance efforts. Meanwhile, in the next five years, there are 32 planned regulations and 14 proposed policies. This represents an overall 67 per cent increase in digital governance efforts, highlighting ASEAN's strengthened commitment to digital transformation, regulatory advancement, and coordinated policy development.



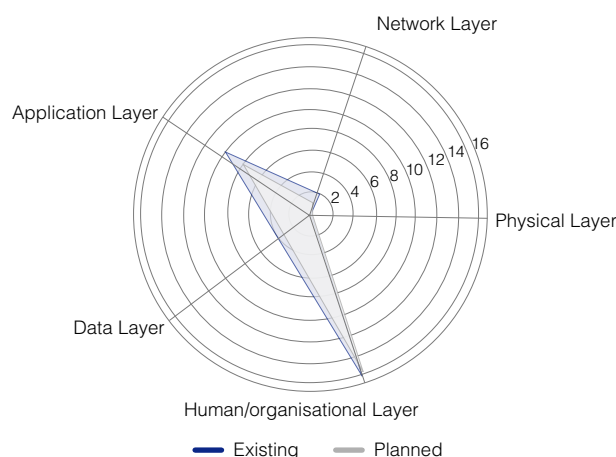
Note: This chart is based on the collected survey results for Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Myanmar, the Philippines, Singapore, and Thailand. Data for Malaysia and Viet Nam were obtained through desk studies.

Figure 3. Existing and planned policy, regulation, and initiative
Source: Regional survey and desk study

To enhance regional digital safety and trust, these efforts span across five layers of cybersecurity protection—the physical layer (infrastructure and device security), network layer (secure connectivity and data transit), application layer (software and platform protection), data layer (data integrity and governance), and human/organisational layer (awareness and institutional readiness).³⁹

Deepfakes, manipulated media, or AI-generated threats.

ASEAN Member States have taken targeted steps to reduce deepfake risks, aligning with a broader regional shift toward the application layer, where AI-generated threats are expected to intensify. Brunei Darussalam supports public verification through Waspada.bn, while Cambodia enforces Inter-Ministerial Prakas No. 170⁴⁰ and its Child Online Protection Guidelines⁴¹ to curb harmful manipulated media. Singapore addresses deceptive or AI-generated content through the Online Criminal Harms Act (OCHA),⁴² the Penal Code,⁴³ and the Elections (Integrity of Online Advertising) (Amendment) Act (ELIONA Act) 2024,⁴⁴ with the latter being specifically applicable to content that misrepresents candidates during the election period. Thailand promotes safe AI use via Electronic Transactions Development Agency (ETDA)'s Responsible AI Promotion Programme.⁴⁵ Securing software, platforms, and digital services (application layer)—as well as addressing human and institutional vulnerabilities (human/organisational layer)—remains a consistent priority both historically and moving forward.



Note: This chart is based on the collected survey results for Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Myanmar, the Philippines, Singapore, and Thailand. Data for Malaysia and Viet Nam were obtained through desk studies.

Figure 4. Existing and planned policy, regulation, and initiative for deepfake
Source: Regional survey and desk study

39. Identity Management Institute (2023)

40. Inter-Ministerial Prakas No. 170 (Open Development Viet Nam, 2018)

41. Cambodian Child Online Protection Guidelines for the Digital Technology Industry (Ministry of Post and Telecommunications, 2023)

42. Online Criminal Harms Act 2023 (Singapore Statutes Online, 2023)

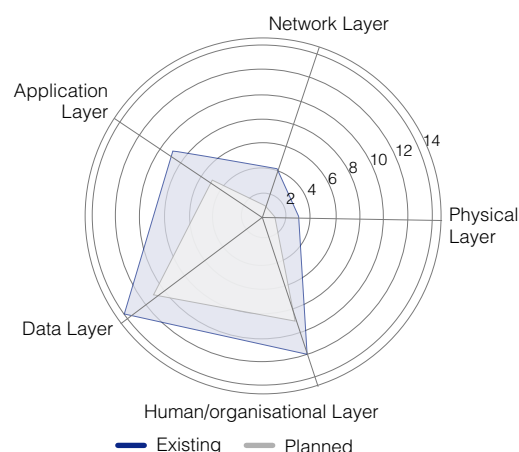
43. Penal Code 1871 (Singapore Statutes Online, 2021)

44. Elections (Integrity of Online Advertising) (Amendment) Act 2024 (Commencement) Notification 2025 (Singapore Statutes Online, 2025)

45. Thailand's AI Governance Guideline for Executive (AIGC Thailand, 2023)

Data breaches

Most ASEAN Member States have adopted or are finalising comprehensive data protection laws—such as Brunei Darussalam’s Personal Data Protection Order, 2025 (PDPO)⁴⁶ Viet Nam’s new Personal Data Protection Law (PDPL) (will become effective on 1 January 2026),⁴⁷ Thailand’s Personal Data Protection Act (PDPA) (in full force on 1 June 2022, after the formation of the Personal Data Protection Committee and the issuance of subordinate regulations),⁴⁸ Cambodia’s 2025 draft,⁴⁹ and Indonesia’s 2022 PDP Law.⁵⁰ Ensuring data confidentiality, integrity, and availability (data layer) continues to be the primary focus, past and future. At the same time, addressing human and institutional vulnerabilities remains consistently strong.



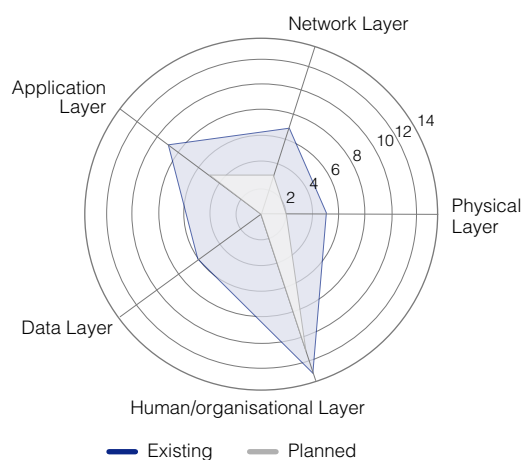
Note: This chart is based on the collected survey results for Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Myanmar, the Philippines, Singapore, and Thailand. Data for Malaysia and Viet Nam were obtained through desk studies.

Figure 5. Existing and planned policy, regulation, and initiative for data breaches

Source: Regional survey and desk study

Cyberattacks

Most ASEAN Member States now have standalone cybersecurity or computer-misuse laws and national CERTs, with several updating frameworks (e.g. Brunei Darussalam Cybersecurity Act consolidated in 2024;⁵¹ Thailand’s and Singapore’s regimes maturing; Myanmar enacted a sweeping law in 2025).⁵² In previous years, a greater number of programmes and policies focused on addressing human and institutional vulnerabilities within the human and organisational layer. Over the next five years, while this focus is expected to continue, there is currently no clear programme, policy, or regulatory framework specifically aimed at ensuring data confidentiality, integrity, and availability (data layer).



Note: : This chart is based on the collected survey results for Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Myanmar, the Philippines, Singapore, and Thailand. Data for Malaysia and Viet Nam were obtained through desk studies.

Figure 6. Existing and planned policy, regulation, and initiative for cyberattacks

Source: Regional survey and desk study

46. Personal Data Protection Order (DataGuidance, 2025)

47. Personal Data Protection Law (EY Viet Nam, 2025)

48. Personal Data Protection Act (Open Development Thailand, 2019)

49. Law on Personal Data Protection (Open Development Cambodia, 2025)

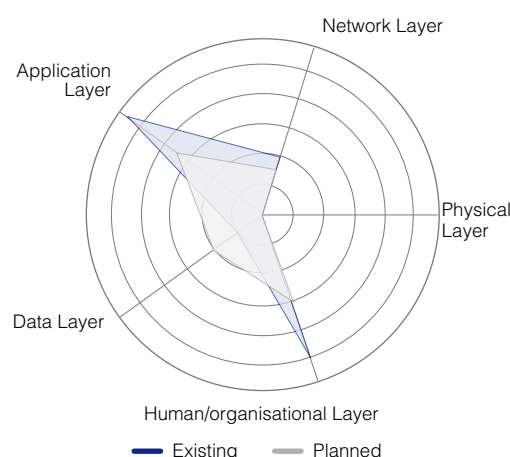
50. Pelindungan Data Pribadi (Database Peraturan BPK, 2022)

51. Cybersecurity Act Chapter 272 (Cyber Security Brunei Darussalam, 2024)

52. Myanmar Cybersecurity Law Takes Effect (Tilleke and Gibbins, 2025)

Online misinformation and disinformation

ASEAN addresses online misinformation and disinformation through legal frameworks, regulatory measures, and digital literacy initiatives, with member states adopting diverse institutional and governance models. These range from centralised mechanisms, such as Thailand's Anti-Fake News Center,⁵³ to multi-agency and integrated approaches that combine regulation, public education, and stakeholder engagement, as seen in Singapore,⁵⁴ Viet Nam,⁵⁵ Indonesia, and the Philippines, while other countries rely primarily on existing cyber laws or ad hoc initiatives.⁵⁶ In Brunei Darussalam, initiatives such as Waspada.bn—a national fact-checking platform—support these efforts by enabling the public to verify information and raising awareness about misinformation and online scams. Meanwhile, other countries rely primarily on existing cyber laws or ad hoc initiatives. In line with the ASEAN Guideline on Management of Government Information in Combating Fake News and Disinformation in the Media (2024),⁵⁷ member states are encouraged to prioritise strategic communication; education, awareness, and advocacy programmes; promotion of media and information literacy; development of fact-checking networks aligned with international codes of principles; strengthened inter-agency coordination and cross-functional collaboration; and the application of law-enforcement measures within their respective national contexts. Both the existing and planned periods continue to focus on addressing human and institutional vulnerabilities, alongside an emphasis on securing software, platforms, and digital services.



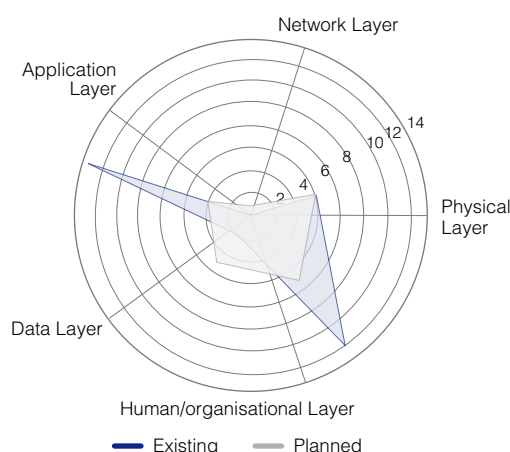
Note: : This chart is based on the collected survey results for Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Myanmar, the Philippines, Singapore, and Thailand. Data for Malaysia and Viet Nam were obtained through desk studies.

Figure 7. Existing and planned policy, regulation, and initiative for online misinformation

Source: Regional survey and desk study

Online Scam

ASEAN has intensified joint actions against scams in the Mekong region through coordinated crackdowns, intelligence sharing, and cross-border rescues,⁵⁸ while member states across the region strengthen national defences through measures such as Singapore's integrated anti-scam tools (such as ScamShield and a national SMS Sender ID Registry).⁵⁹ Indonesia's telco spam blocking and digital literacy efforts,⁶⁰ while Malaysia's cooperation with financial regulators.⁶¹ The Philippines' new laws and multi-agency task forces that focus on SMS filtering, account freezes, and collaboration with banks and telcos,⁶² Thailand's anti-scam centres and transfer limits,⁶³ and Brunei Darussalam's financial advisories and coordinated alerts. Across existing periods, efforts have largely concentrated on the human and organisational layer, as online scams predominantly exploit trust and social engineering rather than technical or physical vulnerabilities. In the planned period, however, programmes, policies, and regulations are expected to place greater emphasis on secure coding practices, patch management, and vulnerability disclosure policies at the application layer, as well as safeguarding data in transit, communication channels, and connectivity at the network layer.



Note: : This chart is based on the collected survey results for Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Myanmar, the Philippines, Singapore, and Thailand. Data for Malaysia and Viet Nam were obtained through desk studies.

Figure 8. Existing and planned policy, regulation, and initiative for online scam

Source: Regional survey and desk study

53. Thailand: Computer Crime Act (Article 19, 2017)

54. Protection from Online Falsehoods and Manipulation Act (POFMA Office, 2021)

55. Draft of Viet Nam's Consolidated 2025 Cybersecurity Law Released (Tilleke and Gibbins, 2025)

56. One Divide or Many Divides? Underprivileged ASEAN Communities' Meaningful Digital Literacy and Response to Disinformation (ASEAN Foundation, 2024)

57. ASEAN Guideline on Management of Government Information in Combating Fake News and Disinformation in the Media (Ministry of Communications and Informatics Indonesia, 2024)

58. Mekong Nations Pledge to Bolster Anti-scam Efforts in 2025 (The Diplomat, 2025)

59. Anti-Scam Centre Initiatives (Singapore Police Force, 2023)

60. Anti-Scam Asia (Indonesia Joins Regional Anti-Scam Alliances, 2023)

61. Malaysian Communications and Multimedia Commission (MCMC) (Consumer Alert List, 2024)

62. Cybercrime Prevention and Anti-Scam Task Force (Department of Information and Communications Technology (DICT, Philippines), 2023)

63. New Measures on Scam Prevention and Online Transfers (Bank of Thailand, 2023)



Key Findings



ASEAN shows strong leadership from its top-tier digital security performers, but significant disparities persist as several ASEAN Member States still lack robust laws, infrastructure, and enforcement—revealing both promising progress and critical gaps that must be addressed to achieve regionwide cybersecurity resilience.



ASEAN's rapid digitalisation is unlocking major opportunities but also increasing exposure to cross-border cyber risks—such as deepfakes, data breaches, and online scams. Strengthening regional collaboration, harmonising policies, improving digital literacy, and expanding user protections are essential to building a safer and more trusted digital ecosystem for ASEAN.

Table 5. Key cybersecurity issues across countries

	Deepfake	Data breaches	Cyberattacks	Online misinformation and disinformation	Scam
Brunei Darussalam					
Cambodia					
Indonesia					
Lao PDR					
Malaysia					
Myanmar					
The Philippines					
Singapore					
Thailand					
Viet Nam					

Note: ■ denotes key cybersecurity issues found



ASEAN is strengthening its cybersecurity resilience through a significant expansion of regulations, policies, and initiatives—rising by 67 per cent between existing and planned periods—with growing emphasis on addressing AI-generated threats, enhancing data protection, and shifting from reactive measures to proactive, multi-layered digital governance that reinforces regional safety, trust, and coordinated readiness across all five layers of cybersecurity.

Table 6. Planned initiatives, policies, and regulations to prevent cybersecurity issues

	Protection of hardware, networks, and physical access to data centres or infrastructure	Safeguarding data in transit, communication channels, and connectivity	Securing software, platforms, and digital services	Ensuring data confidentiality, integrity, and availability	Addressing human and institutional vulnerabilities
Deepfake					
Data breaches					
Cyberattacks					
Online misinformation and disinformation					
Scam					

Note: Indicating the extent of planned initiatives, policies, and regulations.

- Denotes a higher number of planned initiatives, policies, and regulations
- Denotes a lower number of planned initiatives, policies, and regulations
- Denotes no initiatives, policies, or regulations planned yet

Policy Implications

Multiple interconnected elements drive ASEAN's cyber risk profile development for 2025 because of its fast digital growth and changing security threats. Therefore, several drivers need to be enhanced:



Countering AI-Driven Threats

A regionwide ASEAN Cyber Threat Intelligence Hub must be established to provide AI-based detection and monitoring capabilities and enable member states to share threat information across borders. The hub needs to unite research efforts on AI abuse while creating standardised warning systems and developing member state capabilities to fight against malware and phishing attacks and deepfake schemes.



Reducing Attack Surface from Digital Expansion

The ASEAN Digital Security-by-Design Programme should be initiated to help organisations implement secure cloud and mobile and hybrid work systems. The programme should provide sanctioned digital tool guidelines and cloud security provider standards and joint training initiatives to enhance organisational cyber defence capabilities.



Establish a Regional Enforcement System

Regional enforcement systems need to be established to bridge legal gaps between member states while stopping cybercriminals from using different laws to their advantage.



Addressing Legacy System Vulnerabilities

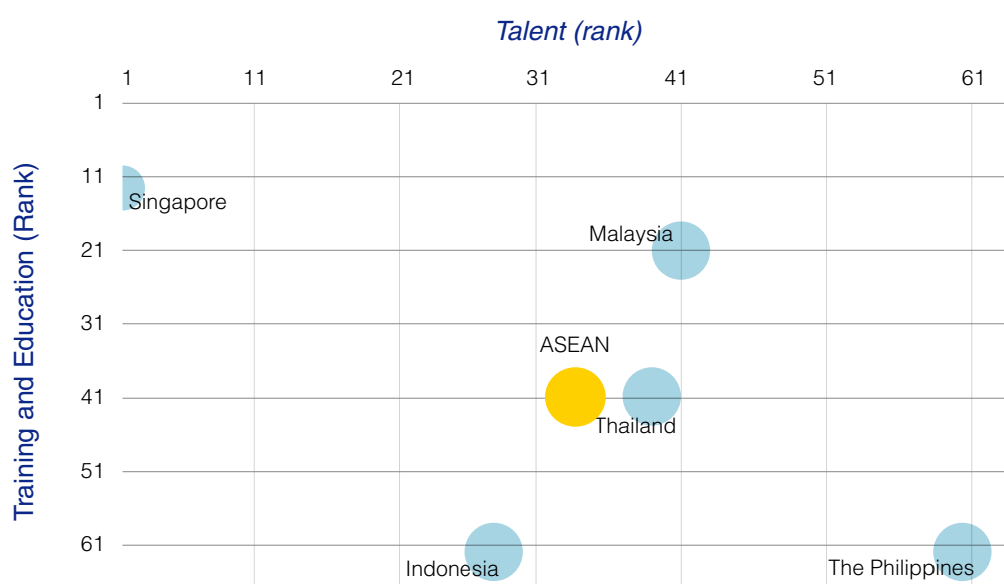
The ASEAN region needs an ASEAN Critical Infrastructure Modernisation Fund to support the transition from insecure legacy systems to cloud-based secure systems. The initiative should help member states implement standardised critical infrastructure protection measures through financial and technical backing for Indonesia and the Philippines, which face elevated legacy system risks.

CHAPTER 3

Fostering Digital Literacy for a Resilient ASEAN Community:

Programmes and Initiatives Aimed at Empowering the ASEAN Community with Relevant Digital Skills, Including AI

How prepared is the community to embrace digitalisation? Does the community possess a diverse skillset that includes proficient use of digital tools for discovering, managing, and producing digital content? According to the Institute for Management Development (IMD) World Digital Competitiveness Ranking 2024,⁶⁴ knowledge pillar, ASEAN ranked 38th out of 67 countries in 2020–2021, which declined to 39th from 2022 to 2024. Further review, in terms of the know-how necessary to discover, understand, and develop new technologies, ASEAN tends to be better prepared in talent capability compared to training and education.



Note: : This chart does not include Brunei Darussalam, Cambodia, Lao PDR, Myanmar, and Viet Nam due to data availability.

Figure 9. ASEAN talent vs. training and education 2024 (rank out of 67 countries)

Source: Institute for Management Development (2024)

The figure below illustrates several underlying factors contributing to digital literacy gaps in ASEAN.⁶⁵ These include the lack of structured programmes, curricula deficiencies, and limited technology access, which hinder consistent learning opportunities. Socio-economic and demographic barriers such as poverty's impact on internet access, rural connectivity challenges, and vulnerable age groups further exacerbate inequality in digital participation. Additionally, low public awareness limits community engagement and the effective use of digital tools. Collectively, these factors reveal that strengthening digital literacy requires multidimensional efforts addressing both infrastructural and social barriers across the region.

64. IMD World Digital Competitiveness Ranking 2024 (IMD, 2024)

65. One Divide or Many Divides? Underprivileged ASEAN Communities' Meaningful Digital Literacy and Response to Disinformation (ASEAN Foundation, 2024)

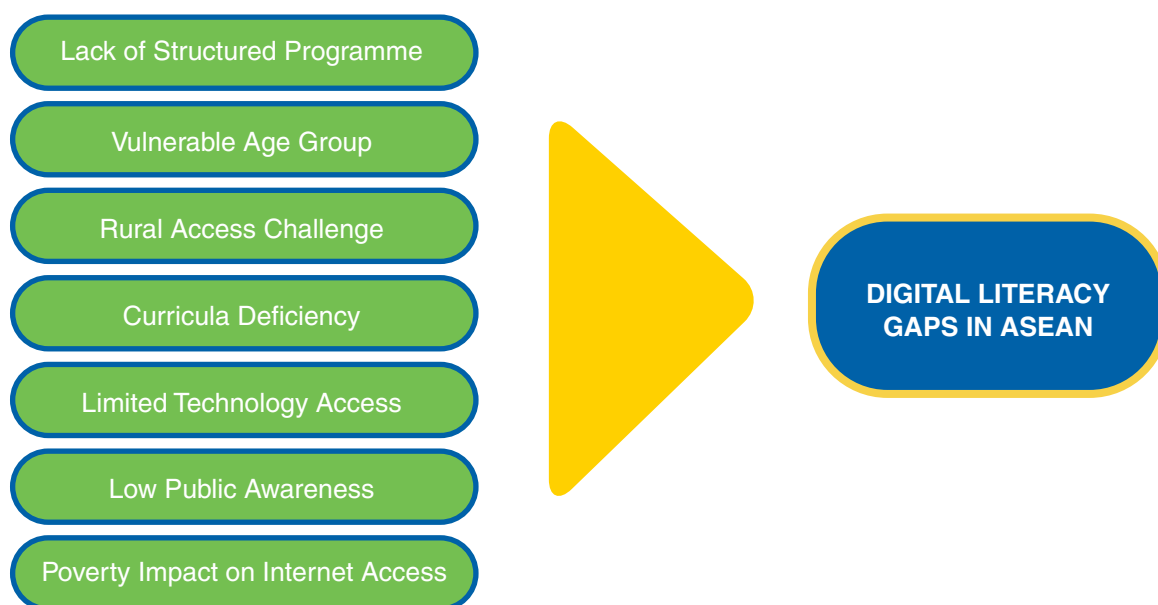


Figure 10. Digital literacy gap
 Source: ASEAN Foundation (2024)

In this context, digital literacy should be viewed as more than just technical proficiency. It demands a holistic approach that bridges policy, community, and industry perspectives. Policymakers play a crucial role in developing inclusive education systems and supportive regulations; citizens serve as active participants who apply digital skills responsibly in daily life; and industries act as key enablers driving innovation and upskilling. When these three actors collaborate, digital literacy evolves into a shared societal capacity—enabling ASEAN to build an inclusive, resilient, and future-ready digital ecosystem.



Perspective of policymakers

From a policymakers' perspective, digital literacy initiatives are grouped into five categories.⁶⁶ Awareness and Education introduces fundamental digital concepts and rights to various communities. Access and Skill-Building ensures equitable access to tools and connectivity while developing essential digital skills. Promotion of Use and Empowerment encourages meaningful use of digital technologies and supports innovation and content creation. Prevention of Harm and Safety promotes cybersecurity, privacy, and ethical awareness to build responsible digital citizens. Evaluation and Improvement focuses on assessing digital literacy and updating programmes to include emerging technologies such as AI, the metaverse, and IoT.

The analysis draws on survey results from Brunei Darussalam, Cambodia, Indonesia, Malaysia, Myanmar, Singapore, and Thailand. Data for Lao PDR, the Philippines, and Viet Nam were obtained through desk studies.

66. UNESCO Digital Literacy Global Framework (ADM, 2025)

Awareness and education

Programmes are more active than policies, showing strong grassroots engagement to introduce fundamental digital concepts, rights, and opportunities to students, parents, workers, and communities. However, policy support remains limited, suggesting the need for stronger institutional backing and standardised digital literacy frameworks.

Access and skill-building

This is the most emphasised area across all categories. High programme activity reflects extensive digital inclusion initiatives aimed at expanding connectivity, tool access, and skill development across demographics. Planned efforts should continue reinforcing equitable participation and address infrastructure gaps in underserved regions.

Promotion of Use and Empowerment

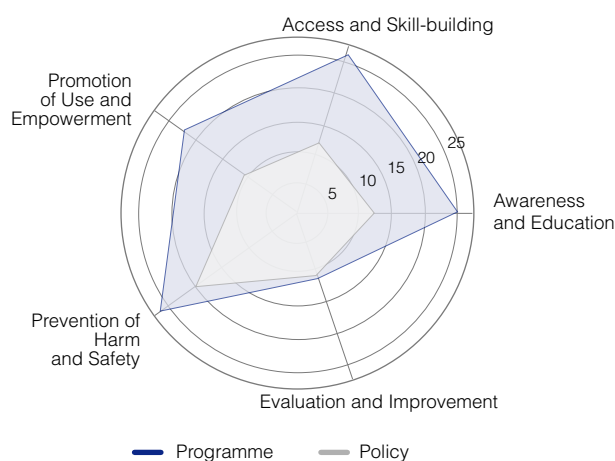
A nearly balanced proportion indicates good alignment between policy and programme efforts. Both emphasise promoting meaningful technology use—such as e-learning, e-commerce, and e-government—while fostering creativity and innovation. Continued integration of user-driven innovation and entrepreneurship is recommended to sustain empowerment.

Prevention of harm and safety

This category is more policy-led, demonstrating strong legal and regulatory efforts toward cybersecurity, data privacy, and online ethics. Programmes are present but less extensive. Future plans should strengthen public awareness campaigns and integrate digital safety education into school curricula to complement existing frameworks.

Evaluation and improvement

This remains the least developed area overall. Limited monitoring and feedback mechanisms hinder continuous improvement. Planned initiatives should include regular assessments, stakeholder surveys, and certification systems that incorporate emerging technologies such as AI, the metaverse, and IoT to ensure adaptive learning ecosystems.



Note: : This chart is based on the collected survey results for Brunei Darussalam, Cambodia, Indonesia, Malaysia, Myanmar, Singapore, and Thailand. Data for Lao PDR, the Philippines, and Viet Nam were obtained through desk studies.

Figure 11. Existing programme vs. existing policy

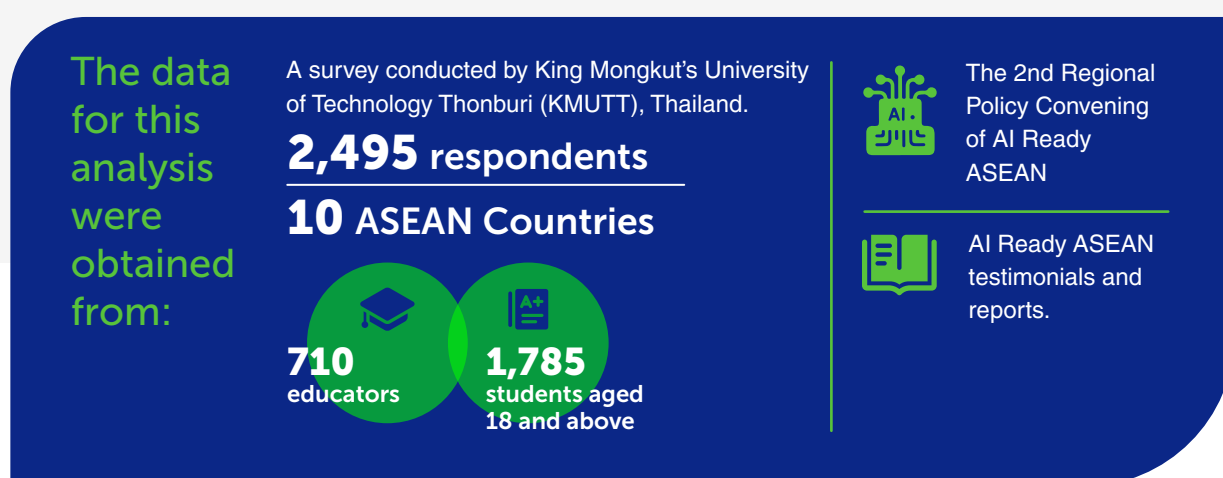
Source: Regional survey and desk study

The radar chart reveals a complementary pattern—programmes drive inclusion and awareness, while policies anchor governance and safety. To achieve a balanced digital ecosystem, countries should now focus on closing the evaluation gap and ensuring that policy frameworks more directly sustain awareness and access initiatives in the long term.



Perspective of the citizens (educators and students)

From a citizen's perspective, digital literacy is understood through six key dimensions. **Awareness and Access** focuses on expanding visibility and equitable entry points into digital and AI learning. **Knowledge and Skills** emphasises developing essential digital competencies and applied understanding for everyday use. **Behaviour and Ethical Use** highlights the importance of safe, critical, and responsible engagement with technology. **Engagement and Creativity** encourages active participation, problem-solving, and innovation in the digital space. **Inclusion and Equity** ensures diversity and equal opportunity for all individuals in digital literacy initiatives. Lastly, **Sustainability and Ecosystem Collaboration** aims to create long-term impact through partnerships and systemic integration. Those dimensions are assessed to the individual as the beneficiary of the programmes, including students and educators.



Awareness and access

Institutions are showing increasing commitment to AI, yet they continue to face challenges related to resources and educator capability. Enhancing teacher training, technical support, and resource allocation is essential to ensure effective and sustainable AI adoption in education.



Educators

More than half of educators (56 per cent) reported that their institutions have a vision or policy for AI integration and expressed motivation to use generative AI in teaching (58 per cent). Forty four per cent indicated having adequate resources. Forty one per cent noted sufficient technical expertise to support implementation.



Students

A majority of respondents (54 per cent) stated that teachers encourage the use of AI, while only 49 per cent believe that teachers have sufficient mastery of AI tools.

Sixty per cent of students agreed that their institutions promote the use of AI in learning practices, and 57 per cent reported that there are sufficient necessary resources supported by their institutions.

Source: KMUTT, Thailand

Knowledge and skills

Developing essential digital competencies and applied understanding. Prompt engineering represents a critical competency at the intersection of AI literacy and personal readiness. The ability to craft effective prompts is refined through experiences and deliberate practices. High-quality prompts not only determine the value of AI-generated outputs but also reveal underlying gaps in understanding and capability. It is essential for governments to support structured training and capacity-building initiatives to strengthen this area across the education sector. Building a supportive community where educators and learners can openly discuss challenges and refine skills is to ensure that productivity is not an isolated pressure but a collective evolution.

Interviews with students and parents in the Philippines and Myanmar highlight how game-based and informal learning within the AI Ready ASEAN programme can serve as a powerful entry point to digital literacy by encouraging learners to move from users to creators.

Participants described coding games as enjoyable and inclusive, particularly for those from remote or underserved areas who had limited exposure to digital creation opportunities. Students who initially viewed coding as something only for experts gained confidence through simple, step-by-step game design activities, such as customising and building their own levels, which allowed them to see their ideas come to life. This hands-on, creative experience fostered a strong sense of pride and capability, sparked new aspirations such as becoming game developers, and increased classroom engagement, including peer support and collaboration. These testimonials illustrate how informal, game-based learning can meaningfully complement formal education by strengthening digital confidence, creativity, and a sense of agency among young learners.

Behaviour and ethical use

AI use in education is growing, but ethical challenges remain. Misconceptions about plagiarism, misinformation risks, and student overdependence show the need for clearer guidelines and stronger digital ethics education to promote responsible and critical AI use.



Educators

Plagiarism

Only 45 per cent of educators view AI use as plagiarism, although it technically is not. Educators express concern that the rapid pace of technology forces them to constantly redesign exam questions to prevent misuse.

Misinformation

Seventy four per cent of educators have the capacity to deliberate misinformation. Around 62 per cent of educators report having frameworks to teach misinformation, and 61 per cent believe these are effective.

However, educators have observed that AI tools sometimes generate fake citations and references, making it difficult for students to verify or explain the content they submit.

Overdependence

Eighty nine per cent of educators claim to understand AI's limitations. Educators note that some students depend on AI even for simple assignments, showing reduced effort to think critically or develop ideas independently.

Source: KMUTT, Thailand



Students

Plagiarism

Despite 57 per cent of students believing it counts as plagiarism, 80 per cent use AI for their assignments.

Misinformation

Seventy seven per cent of students reported that they can verify the reliability of AI-generated information. Eighty four per cent of students often fact-check their results.

Overdependence

Eighty two per cent of students claim to understand AI's limitations. Sixty three per cent of students still rely heavily on AI to complete their tasks. Sixty one per cent of students reported their educators communicate about AI-related ethics.

Engagement and creativity

The data suggests that both educators and students recognise AI's strong potential to enhance engagement and creativity in learning. Educators view AI as a driver of pedagogical innovation and transformation, while students experience tangible benefits in learning speed and effectiveness. To further foster active participation, problem-solving, and innovation, institutions should encourage collaborative AI-driven projects, provide continuous training for educators, and integrate creative, student-centred AI applications into the curriculum.



Educators

A large majority of educators confirmed the positive impact of AI in education, with 82 per cent expressing motivation to use AI in the classroom, 83 per cent acknowledging that AI has enhanced pedagogical innovation, and 76 per cent noting that it has significantly transformed their teaching methods.



Students

Students perceived the positive impacts of AI more strongly than educators, with 86 per cent recognising improvements in the speed of learning and 82 per cent acknowledging enhanced learning effectiveness.

Source: KMUTT, Thailand

Inclusion and equity

These findings highlight progress toward inclusive AI integration in education but also reveal gaps in equitable support. While most institutions ensure broad AI access and foster gender inclusivity, students with disabilities remain under-supported. Strengthening accessibility measures and targeted inclusion strategies is essential to ensure AI benefits all learners equally.



Educators

About 54 per cent of educators said their institutions provide AI access for all students, though only 38 per cent offer adequate support for learners with disabilities. Still, 68 per cent plan to improve equal access across socioeconomic and gender groups.



Students

Sixty nine per cent of students reported equal AI access, 58 per cent noted disability support, and 80 per cent felt that classmates of all genders are equally confident using AI in learning.

Source: KMUTT, Thailand

Sustainability and ecosystem collaboration

Building systemic impact requires strong partnerships and long-term integration. Collaboration should start with a shared framework that addresses regional challenges while ensuring AI solutions align with ASEAN values. Universities can play a leading role by promoting research and student projects that tackle local issues. Philanthropic organisations, meanwhile, should view AI as a borderless and cross-sectoral force, focusing on its real-life impact rather than statistics. They can strengthen collaboration by linking AI initiatives across sectors like water, agriculture, and education by supporting AI literacy beyond classrooms, particularly in rural areas.

From the government side, existing policies must be translated into actionable programmes. Initiatives such as AI Class ASEAN, a multilingual learning platform for students, parents, and teachers, can advance regional learning, digital inclusion, and knowledge exchange across ASEAN countries. Ultimately, stronger coordination among education, government, and philanthropy is vital to ensure AI development meets societal and regional needs. Universities should lead in research and innovation, governments in policy implementation, and philanthropic organisations in bridging sectors and promoting inclusion. A shared, values-driven approach will enable ASEAN to build equitable, responsible, and sustainable AI ecosystems.



Perspective of industry

From an industry perspective, digital literacy is understood through six key dimensions.

Awareness and Access	Focuses on expanding visibility and equitable entry points into digital and AI learning
Knowledge and Skills	Emphasises developing essential digital competencies and applied understanding for everyday use.
Behaviour and Ethical Use	Highlights the importance of safe, critical, and responsible engagement with technology.
Engagement and Creativity	Encourages active participation, problem-solving, and innovation in the digital space.
Inclusion and Equity	Ensures diversity and equal opportunity for all individuals in digital literacy initiatives.
Sustainability and Ecosystem Collaboration	Aims to create long-term impact through partnerships and systemic integration.

The data for this analysis were derived from a desk study and survey designed to provide a case study-based perspective on ongoing AI initiatives. The case study focuses on the AI Ready ASEAN programme, a partnership between the ASEAN Foundation and [Google.org](#). The aim is to generate evidence-based insights to inform regional digital and AI capacity-building efforts across ASEAN.

Awareness and access

AI's role extends beyond skills development to the strengthening of foundational digital infrastructure across Southeast Asia. The rapid growth of AI applications is driving unprecedented demand for AI-ready data centres to support cloud computing, high-performance computing and data-intensive workloads. Market forecasts indicate that data centre investment in Southeast Asia could reach approximately USD 30 billion by 2030.⁶⁷ AI-driven demand has prompted a shift towards AI-ready data centres with higher power density, advanced cooling systems and resilient electrical infrastructure, requiring strategic planning of power, thermal and procurement systems well ahead of construction. This expanded infrastructure is essential to ensure equitable and reliable access to AI services, data storage and digital platforms, thereby enhancing visibility and entry points into digital and AI learning for users and enterprises across ASEAN.⁶⁸

Data centres and AI infrastructure are strategic enablers of ASEAN's digital future, requiring coordinated action from governments, industry and investors. Governments play a central role in establishing supportive policy and regulatory frameworks, while telecommunications and energy providers underpin reliable connectivity and power supply. While requiring substantial investment, this infrastructure presents strong long-term value creation opportunities and serves as a cornerstone for sustainable digital growth and enhanced regional competitiveness.⁶⁹

67. Southeast Asia Data Center Market Landscape 2025-2030

68. How AI is transforming Southeast Asia data centres (Turner and Townsend, 2026)

69. Southeast Asia's data centres and AI infrastructure imperative Capitalising on a once-in-a-generation opportunity (Deloitte, 2025)

Knowledge and skills

Southeast Asia is experiencing robust growth in AI talent, with annual expansion exceeding 10 per cent, reflecting the region's proactive efforts to strengthen its digital workforce. Countries across ASEAN are making meaningful progress in developing talent pipelines to support emerging technologies and innovation. At the same time, variations in the distribution and maturity of AI expertise persist, shaped by differing levels of economic development, education capacity and evolving industry demand. These dynamics present both opportunities and areas for continued regional cooperation to ensure more balanced and inclusive digital workforce development.⁷⁰

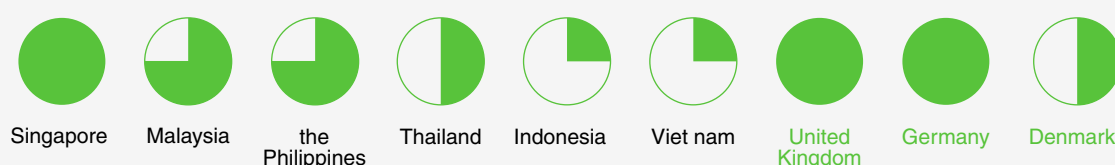


Figure 12. Hiring demand of AI professionals by country

Source: LinkedIn Talent Insights as of November 2024

Based on *Artificial Intelligence and the Future of Work in Southeast Asia: A Desktop Study of Opportunities, Challenges, and Workforce Readiness*,⁷¹ the analysis highlights several sectors where future workforce skill requirements are becoming increasingly critical across ASEAN.

Information Technology and AI-Related Fields

The technology sector demonstrates a growing demand for advanced technical competencies, including artificial intelligence, data science, machine learning and programming (such as Python). Capabilities in data interpretation and big data analytics are identified as core requirements to support digital innovation and the broader integration of AI across industries.

Human-Centred and Cross-Cutting Skills

Beyond technical expertise, the study underscores the importance of human-centred skills, including creativity, adaptability, critical thinking and ethical judgement. As human-AI collaboration becomes more prevalent, these competencies are essential to enable informed decision-making, responsible technology deployment and resilience in rapidly evolving digital work environments.

Behaviour and ethical use

Southeast Asia's AI industry is entering a defining phase of growth, underpinned by rapid digital adoption, strong policy support, and a dynamic, youthful talent base. Across ASEAN, AI is driving transformation in **healthcare** through improved diagnostics and expanded telemedicine; in **financial services** through enhanced risk assessment, fraud detection, and personalised products; in **retail and e-commerce** through more intelligent supply chains and customer engagement; in **logistics and manufacturing** through automation and predictive analytics; and in **digital services** through generative AI applications that strengthen content creation, customer service, and business process capabilities. The emergence of localised AI models further reflects the region's innovative capacity, enabling solutions that respond to ASEAN's linguistic diversity—including Lao, Malay, Thai, and Vietnamese—and its varied cultural contexts.⁷²

As citizens and enterprises across ASEAN increasingly shape and deploy AI technologies, fostering safe, critical and responsible engagement is essential. This requires strong governance frameworks, clear ethical standards and robust data protection to ensure transparency, accountability and fairness, while mitigating risks such as misuse and bias. By embedding these principles into policy and practice, ASEAN can sustain public trust, strengthen regional digital resilience and ensure that innovation remains inclusive, people-centred and supportive of sustainable growth.

70. Unlocking Southeast Asia's AI Potential. Michael Meyer, Ipshita Bhattacharya, Anant Shivraj, Devansh Anand, Julio Fajardo (2025)

71. White Alan, A. R., Darodjat, T. A., and Maryano, M. (2025). Artificial Intelligence and the Future of Work in Southeast Asia: A Desktop Study of Opportunities, Challenges, and Workforce Readiness. Penanomics International Journal of Economics.

72. Artificial Intelligence (AI) in Southeast Asia 2025-2026 (Source of Asia, 2025)

Engagement and creativity

The rapid advancement of AI and Generative AI presents significant opportunities for deeper industry engagement and innovation across ASEAN. By 2027, AI and GenAI are projected to contribute approximately USD 120 billion to Southeast Asia's Gross Domestic Product (GDP), delivering meaningful uplift across all ASEAN-6 markets and reinforcing strong industry optimism. This growth highlights the importance of strengthening problem-solving capabilities, digital experimentation and collaborative innovation across the regional economy. Supporting active engagement and creativity within these sectors will be key to translating economic potential into inclusive, innovation-led growth across ASEAN.⁷⁰

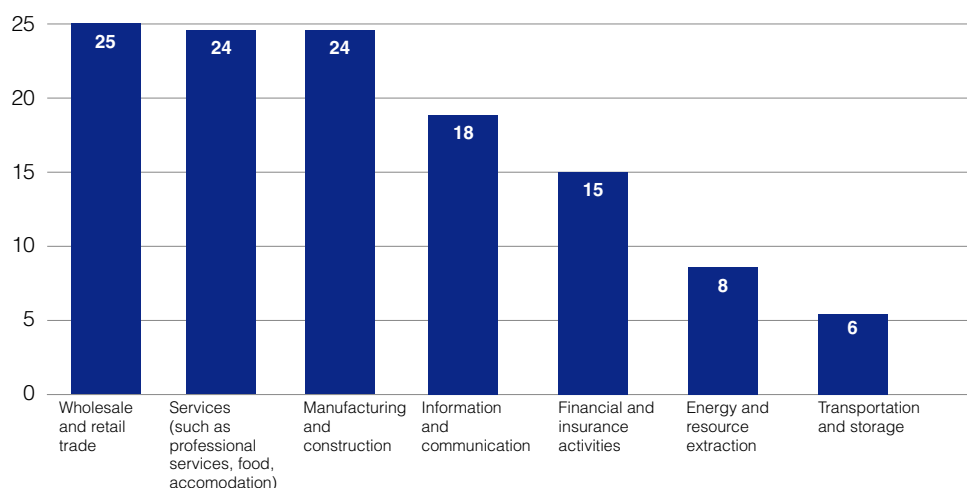


Figure 13. Impact of AI by Sector (Billion USD)

Source: IMF, BCG Build For the Future 2024 global study, 2024 IMDA DAI Survey, BCG analysis

Drawing on Boston Consulting Group (BCG)'s Build for the Future framework, which assesses 34 capabilities across six dimensions of digital maturity—AI adoption, AI ambition, ecosystem leveraged, challenges and catalysts in AI adoption, AI-related investments, state of enablers: tech, data and people, regional self-assessments indicate that Southeast Asia demonstrates strong strategic intent in AI adoption. Organisations were benchmarked across four stages—Starter, Literate, Performer and Leader—revealing that the region places comparatively greater emphasis on strategy-setting, scoring 36 on the digital maturity scale against a global average of 33. This above-average performance reflects ASEAN's clear commitment to advancing its digital economies and embracing transformative technologies at scale.⁷⁰

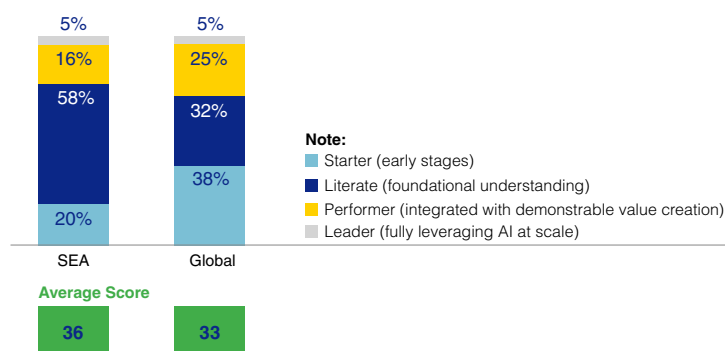


Figure 14. Strategic in AI Adoption

Source: BCG-the Infocomm Media Development Authority (IMDA)-Temasek survey

70. Unlocking Southeast Asia's AI Potential. Michael Meyer, Ipsitha Bhattacharya, Anant Shivraj, Devansh Anand, Julio Fajardo (2025)

Inclusion and equity

Inclusion and equity are foundational to ASEAN's vision of a digitally empowered, people-centred region, ensuring that the benefits of AI extend across diverse communities. Safe and inclusive AI adoption must reflect Southeast Asia's **cultural and linguistic diversity**, supported by context-sensitive digital literacy and greater awareness of how algorithms shape information and opportunity. At the same time, workforce transformation efforts prioritise targeted upskilling, equitable access to digital infrastructure and education reforms that integrate both technical and human-centred competencies, **enabling broader participation** in the digital economy.⁷³

As AI adoption accelerates across manufacturing, services and agriculture, it presents meaningful opportunities for productivity gains, new forms of employment and improved service delivery, while also highlighting the importance of mitigating risks such as displacement and skills gaps. Through tailored policy pathways, inclusive skills development and strengthened regional cooperation, ASEAN can ensure that AI and automation enhance socioeconomic inclusion and contribute to sustainable, broad-based growth across the region.⁷⁴

Sustainability and ecosystem collaboration

Sustainability and ecosystem collaboration are essential to ensuring that AI generates long-term impact across ASEAN. As AI adoption expands—from healthcare and customer service to manufacturing and finance—supported by advances in data availability, cloud infrastructure, AI chips and integration with technologies such as IoT and blockchain, **sustained growth will depend on strong cross-sector partnerships**. Through coordinated efforts among governments, industry, research institutions and investors, ASEAN can foster a resilient, **innovation-driven AI ecosystem** that supports systemic integration, sustainable development and shared regional prosperity towards 2030 and beyond.⁷⁵



73. Enabling Safe and Inclusive Use of AI in Southeast Asia (Southeast Asia Development Solutions, 2024)

74. 2025 AI and Workforce Transformation: Unlocking Pathways to Inclusive Growth in ASEAN Developing Economies (AI Asia Pacific Institute, 2025)

75. Artificial Intelligence - Southeast Asia (Statista, 2025)



Advancing regional AI readiness: insights from the AI ready ASEAN Programme

Awareness and access

The initiative broadens awareness and access to digital and AI learning opportunities by focusing on expanding visibility and equitable entry points for individuals and communities. It adopts an inclusive, multi-stakeholder approach that engages social media influencers, students, youth, educators, parents, NGOs, universities, and governments across different roles and levels.

These entry points are delivered through a combination of initiatives, including the Regional Awareness Campaign, the Hour of Code initiative, the Regional AI Resource Hub, targeted training modules for specific audiences, a Train-the-Trainer (ToT) model to scale community-based learning, and policy advocacy and research to support a broader enabling ecosystem.

Knowledge and skills

The initiative builds digital and AI competencies through AI Ready ASEAN across different user groups through three core learning pillars. First, computational thinking and logic are developed through the Hour of Code and unplugged activities, enabling learners to strengthen problem-solving skills, pattern recognition, and algorithmic thinking that underpin AI systems.

Second, Data and AI Literacy introduces foundational concepts such as how AI models are trained on data, the range of AI tools available—including generative AI—and practical skills such as effective prompt engineering. Third, ethical and responsible use emphasises awareness of bias, data privacy, and AI safety, including the ability to identify deepfakes, misinformation, and understand copyright considerations in digital environments.

The training design of the AI Ready ASEAN programme adopts a tiered, hands-on approach to ensure that AI concepts are accessible to diverse audiences, regardless of technical background or internet access. At the core of this model is a Train-the-Trainer (ToT) mechanism, in which 2,000 Master Trainers—comprising local leaders and educators—receive 20 hours of intensive instruction on AI fundamentals and effective teaching methodologies. These trainers then deliver in-depth, 12-hour workshops to approximately 800,000 students, parents, and teachers, with a focus on practical AI applications and ethical considerations. To further extend reach, the programme employs a mass outreach strategy using the Hour of Code format, consisting of 60-minute introductory sessions that provide foundational AI awareness to an estimated 5.5 million participants across the region.

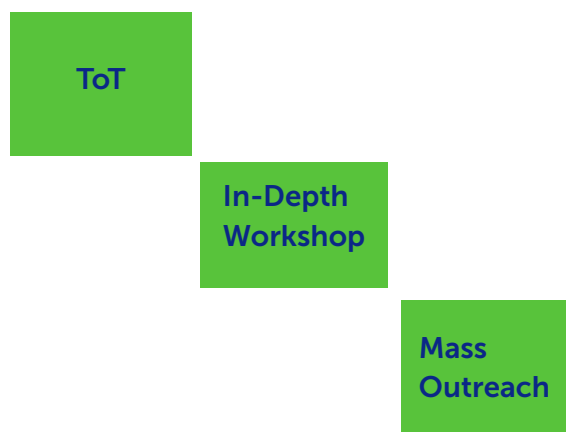


Figure 15. Cascading training model

To bridge the digital divide, the pedagogy utilises Code.org’s block-based coding for hands-on creation and “unplugged” physical activities to teach AI logic without needing computers or the internet. By blending high-tech tools like AI-powered chatbots with low-tech resources like “AI 101 comics” and logic games, the programme makes complex concepts relatable, ethical, and practical for over 5.5 million people across the region.

Behaviour and ethical use

Responsible use of technology, AI ethics, and online safety are integrated into the learning content through dedicated modules such as “AI Ethics and Responsible AI Use” and “Data Privacy and AI Safety”, which address practical risks including bias, misinformation, and data protection. This ethical framework is further localised by role, with educators receiving training in digital pedagogy to navigate issues such as plagiarism and copyright, while parents focus on safeguarding their children’s digital footprint and understanding the privacy implications of AI tools. By aligning all content with the ASEAN Guide on AI Governance and Ethics, the programme ensures that even underserved communities develop the critical thinking skills needed to apply AI for social good while upholding human-centricity and security.

The AI Ready ASEAN programme fosters critical thinking by moving beyond basic skills to address the profound social and ethical implications of technology through a combination of high-level dialogue and grassroots reflection.

Regional Policy Convenings

These events bring together policymakers, youth leaders, and tech experts to debate urgent issues such as the Inclusion Debate: Participants reflect on whether AI will bridge the digital divide or deepen regional inequality, and Governance vs. Innovation: Dialogues explore how to move from the broad principles of the ASEAN Guide on AI Governance to practical, evidence-based local policies.

Campaign-Led Public Discourse

The campaign prompts the general public to question their relationship with AI through relatable storytelling.

Collaborative Learning Reflections

Structured Debriefs: Every 60-minute “Hour of Code” session includes a mandatory reflection period. Case Study Analysis: Master trainers facilitate small-group “World Café”-style dialogues where participants analyse scenarios like deepfakes or algorithmic bias, teaching them to verify information and challenge automated outputs.

Evidence-Based Reflection

The initiative publishes a Regional Research Report on AI Literacy, providing data-driven insights into the region’s unique adoption challenges. This research serves as a mirror for communities, allowing them to reflect on their own readiness and the specific risks—such as AI-generated scams or cultural bias—prevalent in their national contexts.



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Engagement and creativity

The AI Ready ASEAN initiative is designed to enable learners to transition from passive consumers of technology into informed and confident creators by providing structured, application-orientated learning environments where knowledge is actively applied. The programme sustains learner engagement through a high-touch, high-tech support system that integrates expert human mentorship with a dynamic digital learning community, ensuring continuous guidance and peer interaction throughout the learning journey. To reinforce motivation and progression, the initiative incorporates gamified elements such as digital badges for each completed module, alongside formal certificates that signal competency and enhance employability. Through this combination of experiential learning, personalised support, and recognition mechanisms, the programme creates an inclusive learning experience that builds confidence and readiness for participation in an AI-driven future, including for individuals without prior technical backgrounds.

Table 7. Examples of participant innovation

Notable Project	Key Innovation	Local Impact
MySelamat	AI-driven rescue route planning	Enhanced flood disaster response in Malaysia.
SIGAP UMKM	AI trust-scoring for micro-businesses	Increased financial inclusion for small vendors in Indonesia.
AgriAccess	Market-data AI for smallholders	Empowered regional farmers with economic insights.
Dancing AI	Machine Learning (ML) cultural gesture recognition	A tool designed to preserve traditional ASEAN dances (like the Thai Mae Bot Yai) by encoding the “logic” of movement into 3D models and interactive AI systems.

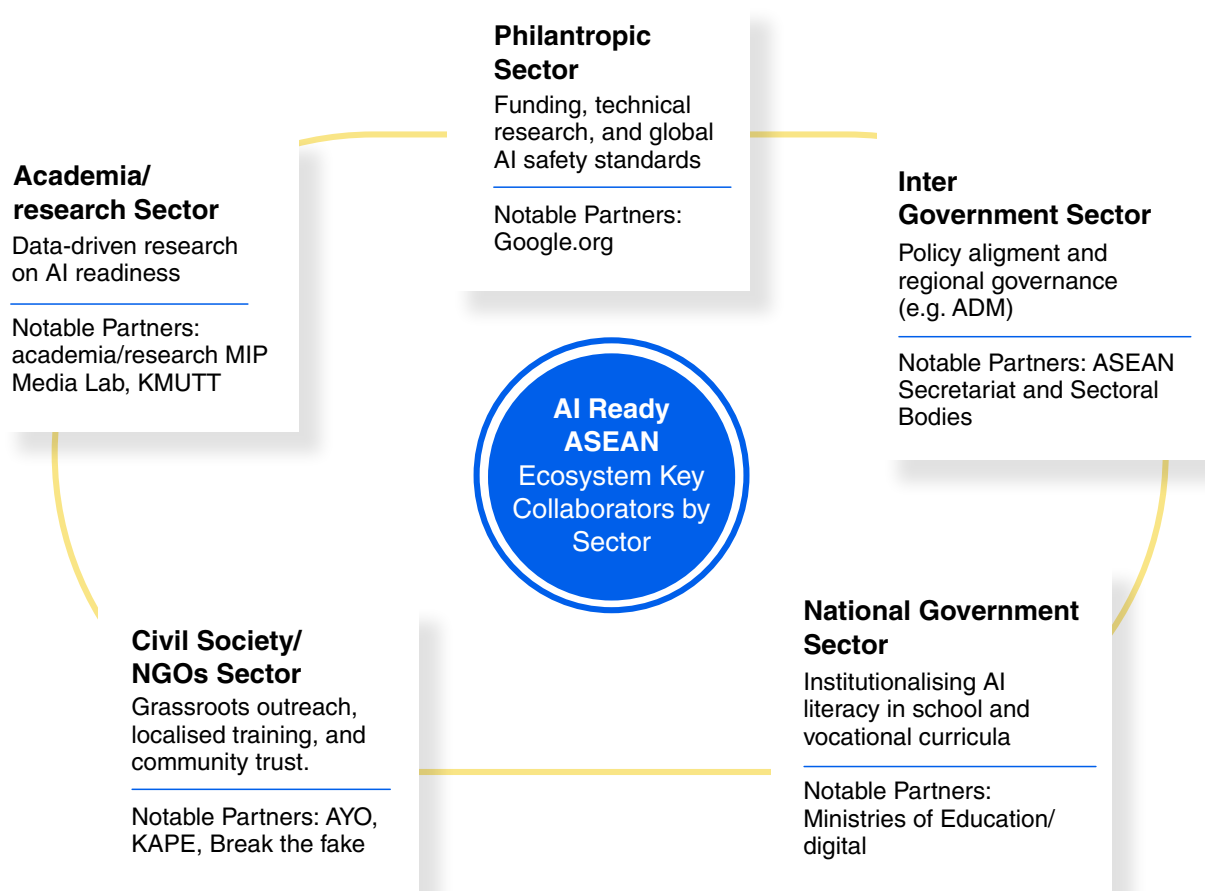
Inclusion and equity

The AI Ready ASEAN programme applies a localised, low-barrier approach to ensure inclusive access to AI literacy, particularly for underserved communities. It reaches rural and low-connectivity areas through unplugged learning activities, integrates gender-responsive content and flexible delivery for women and girls, and combines top-down coordination with government institutions and bottom-up outreach through trusted local partners.

The AI Ready ASEAN programme prioritises an inclusive participant profile by targeting underserved communities to prevent the widening of the digital divide as technology advances. Preliminary research and project data from 2024–2025 indicate a diverse demographic reach, focusing on individuals aged 15–64, particularly youth, parents, and educators, many of whom have no prior exposure to AI learning. The programme emphasises gender balance and outreach to secondary cities and rural provinces with limited access to formal technology education, while qualitative insights highlight differing needs across learner groups—urban participants tend to focus on ethics and safety, whereas rural and low-income learners prioritise employability and economic resilience. Identified awareness gaps, including skill overestimation among youth and trust and language barriers among older learners, are addressed through practical learning approaches and content localised in all ASEAN languages.

Sustainability and ecosystem collaboration

The initiative contributes to systemic and long-term impact in digital literacy by operating within a robust cross-sectoral ecosystem that connects high-level technological expertise with grassroots communities. The AI Ready ASEAN programme brings together governments, industry partners, educational institutions, civil society organisations, and local implementers to align policy direction, learning content, and on-the-ground delivery. This integrated approach ensures that digital and AI literacy efforts are not implemented as stand-alone interventions but are embedded within existing education systems, community networks, and national priorities, enabling sustained capacity building and scalable impact across the region.



Sustainability is built on a “Seed-to-Scale” financial model, where an initial USD 5 million grant from Google.org acts as a catalyst, covering the high upfront costs of platform development and the training of 2,000 Master trainers. To move beyond grant cycles, the programme is being strategically embedded into the ADM 2025 and the ASEAN Community Vision 2045, ensuring it remains a priority for intergovernmental policy.

Table 8. Sustainability pillars

Pillar	Mechanism	Long-term Outcome
Funding	Transition from Google.org/Microsoft grants to national digital budgets.	Continued zero-cost access for citizens.
Institutional	Anchored in the ASEAN Foundation and national Ministries of Education .	Permanent inclusion in regional policy agendas.
Curricular	Mapping modules to TVET and LMS standards for formal credits.	AI literacy becomes a mandatory school subject.
Community	A self-sustaining network of 2,000 master trainers across 10 countries.	Localised, peer-to-peer knowledge

The AI ready ASEAN programme serves as a strategic bridge between high-level intergovernmental policy and grassroots implementation, acting as a primary advocate for a human-centric digital future in Southeast Asia. By hosting regional policy convenings—such as the 1st convening in Jakarta and the 2nd convening in Kuala Lumpur, both held in 2025—the programme facilitates direct dialogue between policymakers, tech leaders, and civil society to operationalise the ASEAN Guide on AI Governance and Ethics (2024) as well as the Expanded ASEAN Guide on AI Governance and Ethics – Generative AI (2025). These efforts are supported by evidence-based knowledge sharing, notably through the ASEAN Responsible AI Roadmap (2025–2030) and the “Assessing AI Readiness in ASEAN” research, which provide the data-driven insights necessary for member states to address the “literacy gap” and urban-rural divide. Beyond policy, the Foundation standardises digital values across the region by championing the Five Core ASEAN Digital Literacy Values—Responsibility, Empathy, Authenticity, Discernment, and Integrity—advocating for their integration into national curricula to ensure that the region’s USD 2 trillion digital economy remains inclusive and safe.

To monitor and evaluate outcomes, the initiative utilises a Results-Based Management (RBM) framework, collecting real-time data through the AI Class ASEAN e-learning platform to track progress, module completion, and participant feedback.

Table 9. Sustainability and scaling framework

Dimension	Scaling and Monitoring Strategy	Long-Term Outcome
Scaling	The ToT model leverages 2,000 master trainers.	Sustained peer-to-peer knowledge transfer at the community level.
Monitoring	Real-time analytics via the AI Class ASEAN e-learning platform.	Data-driven adjustments to curriculum and outreach effectiveness.
Integration	Formal mapping to National School and Technical and Vocational Education and Training (TVET) Curricula .	AI literacy becomes a mandatory and credited educational standard.
Evaluation	Regional Research Hub and Social Return on Investment (SROI).	Evidence-based policy influence and regional benchmark setting.



Key Findings



ASEAN shows strong leadership from its top-tier digital security performers, but significant disparities persist as several ASEAN Member States still lack robust laws, infrastructure, and enforcement—revealing both promising progress and critical gaps that must be addressed to achieve regionwide cybersecurity resilience.

Table 10. Addressing the digital literacy gap in 2024

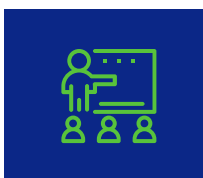
	Perspective of policymakers	Perspective of the citizen	Perspective of industry
Lack of structured programme	Strongly addressed—national roadmaps and large-scale programmes in almost all ASEAN Member States		Embedded into the ASEAN Digital Masterplan 2025 and the ASEAN Community Vision 2045
Vulnerable age groups	Improved but uneven—strong focus on seniors, youth, and women; limited coverage for persons with disabilities	54 per cent of educators report AI access, but only 38 per cent provide adequate disability support; 58 per cent of students note support	Inclusive AI literacy access through gender-responsive and flexible delivery approaches
Rural access challenges	Moderate—infrastructure-driven (Net Pracharat, free Wi-Fi, broadband laws)	Supporting AI literacy beyond classrooms, particularly in rural areas	Inclusive AI literacy reaches underserved rural communities via unplugged learning.
Curriculum deficiency	Strengthening—Digital Skills for Life (DSL) (Singapore), AI/teacher training (Malaysia, Thailand, Viet Nam)	Educators see AI driving innovation, while students experience faster, more effective learning outcomes	E-learning modules integrated into national Learning Management Systems (LMS) and TVET systems.
Limited technology access	Moderate—device/connectivity support present but not universal		AI literacy expanded to low-connectivity areas through unplugged learning.
Low public awareness	Very strong—mass campaigns, cyber awareness, literacy movements	Strengthened teacher training, technical support, and resources are vital for sustainable AI adoption in education	Coordinated initiatives expand equitable access to digital and AI learning
Poverty's impact on internet access	Still weak/indirect—addressed mainly through connectivity subsidies rather than affordability programmes		

Note:

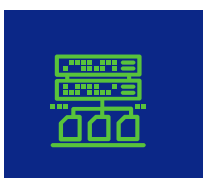
- Denotes issues that have been addressed.
- Denotes issues that have not yet been addressed.



From the perspective of policymakers, digital literacy efforts are largely programme-driven with limited policy backing—while access, safety, and empowerment are progressing, major evaluation gaps persist, underscoring the need for stronger institutional frameworks to sustain long-term digital inclusion and resilience across ASEAN.



From the perspective of citizens (educators and students), AI adoption in ASEAN education shows strong potential to enhance engagement, creativity, and learning outcomes, yet resource gaps, uneven skills, ethical concerns, and inclusion challenges persist—highlighting the need for stronger training, clearer guidelines, and coordinated ecosystem support to ensure that this positive momentum leads to equitable, responsible, and sustainable AI-driven learning for all.



From the perspective of industry (Google through AI Ready ASEAN), digital and AI literacy efforts in ASEAN are most effective when they are scalable, workforce-relevant, and embedded within a cross-sectoral ecosystem. Cascading training models, gamified learning incentives, and alignment with long-term regional frameworks support sustainability beyond grant cycles, while the combination of top-down coordination with governments and bottom-up delivery through local partners expands reach. Together, these elements underscore the importance of clear skills pathways and policy alignment to translate learning investments into a future-ready workforce.



Policy Implications

Multiple interconnected factors shape the development of digital literacy across ASEAN in 2025, driven by rapid digital transformation and evolving technology use. In this context, several key drivers need to be strengthened to ensure inclusive, safe, and effective digital participation across the region.



Activating Universities as Innovation Anchors

Universities should serve as innovation anchors by linking digital and AI literacy with applied research and student-led solutions that address local and community needs.



Policy-Orchestrated Digital Literacy Ecosystems

Governments should shift from programme-based delivery toward policy-orchestrated digital literacy ecosystems that enable scale, coordination, and long-term sustainability.



Catalytic Role of Philanthropic Organisations

Philanthropic organisations can act as catalysts by piloting inclusive delivery models and bridging policy, industry, and community actors, particularly for underserved groups.



Designing for Inclusive Access Across Geographic and Socioeconomic Boundaries

Digital literacy strategies should explicitly incorporate low-cost, low-bandwidth, and offline pathways to address poverty-related barriers to internet access.



Embedding Responsible Ethical Use

Embedding responsibility and inclusivity into digital and AI literacy pathways will help foster trustworthy, inclusive, and sustainable technology adoption across ASEAN.



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At the ASEAN Foundation, we approach AI as part of a **human-centred digital transformation journey**. We often describe this as building a “Go Digital ASEAN House”—because AI and digital technology can only strengthen our ASEAN human capital and ASEAN Digital Community when the full structure is in place.

The foundation of this house is literacy

AI can only improve education, health, and social services if citizens and frontline workers understand and trust it. Through the ASEAN Digital Literacy Programme—now expanded into the ASEAN Digital Academy—and **AI Ready ASEAN**, supported by Google.org, we are strengthening digital and AI literacy, responsible use, and ethical awareness across the region, with a target of 5.5 million people.

In parallel, **the ASEAN Data Science Explorers**, in partnership with Systemanalyse Programmentwicklung (SAP), have engaged over 110,000 youth, equipping them with data analytics and AI-enabled problem-solving skills. These initiatives directly support public education systems by preparing future teachers, civil servants, and innovators to use data science and AI for public problem-solving.

The doors and windows of the house represent economic opportunity

Public service delivery also means enabling citizens to earn sustainable livelihoods. Through AI for MSMEs Advancement, supported by Asian Venture Philanthropy Network (AVPN), Google, and Asian Development Bank (ADB), we are helping 120,000 ASEAN MSMEs adopt AI tools to improve productivity, compliance, and market access—reducing long-term pressure on government support systems.

Complementary initiatives with Huawei and TikTok extend AI-enabled skills and digital market access to SMEs, artisans, and rural entrepreneurs. In this way, AI becomes an extension of economic public services—delivered at scale and at a lower cost.

The walls and roof of the house are security and protection

As ASEAN digitalise services, new risks inevitably emerge. Through Scam Ready ASEAN, reaching three million people, and the ASEAN-Mastercard Cyber Empowerment Programme, we use AI-enabled tools to protect citizens from online fraud and cyber threats. This is now a core public service function, essential to maintaining trust in digital government systems.

At the heart of the house are people and wellbeing

Through **Digital Wellness ASEAN**, we emphasise ethical, mindful, and responsible technology use—recognising that AI must support mental health, social cohesion, and human dignity. AI should strengthen, not weaken, the social contract between governments and citizens.

Together, these experiences show that **AI/digital readiness determines development impact and foster digital literacy for a resilient asean community.**



CHAPTER 4

Future Outlook, Visionary Recommendation, Indicator to Measure, Definition to Look Up



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Business perspectives using the Gartner's Hype Cycle

Through the Gartner's Hype Cycle framework, the evolution of digital technology is analysed to understand emerging hype and expectations. The Gartner's Hype Cycle is a visual tool that illustrates the perceived value and market promotion of a technological trend or innovation over time.⁷⁶ It aids in understanding how the perceived value of a technology changes throughout its maturity lifecycle.⁷⁷ Throughout this lifecycle, the Gartner Hype Cycle forecasts the potential growth and value that technology can offer during its current and future stages of maturity. Google Trends Analytics for financial technology concepts related to digital technology is utilised to analyse patterns, hype, and cycles. The hype data is derived from public search traffic on Google Trends, while the analysis utilises global trend insights interpreted through the lens of ASEAN-related keywords (which reflect regional topics and interests). The Gartner's Hype Cycle of digital technology will be explained in five-stage patterns, including **Innovation Trigger**, **Peak of Inflated Expectations**, **Trough of Disillusionment**, **Slope of Enlightenment**, and **Plateau of Productivity**.

76. Özgür Dedehayir and Martin Steinert, "The Hype Cycle Model: A Review and Future Directions," *Technological Forecasting and Social Change* 108 (July 2016): 28–41.

77. Steinert, M., and Leifer, L. (2010). Scrutinizing Gartner's hype cycle approach. *PICMET 2010 Proceedings*, July 18–22, Phuket, Thailand.

Methodology for Constructing the ASEAN Emerging Technology Hype

This study develops an evidence-based hype for emerging technologies in the ASEAN region by combining structured keyword curation, multi-source empirical indicators, and comparative assessment against Gartner-style lifecycle criteria. The analytical process consisted of four sequential stages.

Keyword Operationalisation

ADM 2025, national digital economy strategies (Indonesia, Malaysia, the Philippines, Singapore, Thailand, Viet Nam), industry trend reports (Google–Temasek–Bain, McKinsey, ADB, ITU)

Global taxonomies (Gartner, The Organisation for Economic Co-operation and Development (OECD), GDELT's THEMEX system)

Campaign-Led Public Discourse

- a. Public Attention Indicators: ASEAN Vision Documents, ADB briefs, National AI strategies.
- b. Investment and Market Growth Indicators: Google–Temasek–Bain e-Economy report, McKinsey, International Finance Corporation (IFC), Statista.
- c. Adoption and Deployment Indicators: National digital identity agencies, central bank data, International Federation of Robotics (IFR) robotics database.
- d. Readiness and Regulatory Indicators: Central banks, ASEAN Smart Cities Network (ASCN), Bank for International Settlements (BIS), ITU.

Evidence Scoring

- a. Quantitative Scoring: captured numerical signals such as growth percentage, absolute adoption numbers, number of deployments, pilots, or regulatory actions, and market value or investment levels. These are translated into intensity categories (low/medium/high) using ASEAN-specific percentile cutoffs.
- b. Qualitative Assessment: Qualitative factors are used to validate whether the technology exhibits characteristics typical of Gartner's Hype Cycle phases.
 - Early research or trials representing the Innovation Trigger.
 - Inflated media enthusiasm leading to the Peak of Inflated Expectations.
 - Widespread pilot failures marking the Trough of Disillusionment.
 - Increasing enterprise deployment signalling the Slope of Enlightenment.
 - Mature, stable Return on Investment (ROI) indicating the Plateau of Productivity.

Gartner's Hype Cycle Stage Classification

Each technology was assigned a hype stage by triangulating signal volume, signal growth rate, deployment maturity, ROI, visibility, regulatory and ecosystem readiness, and presence of disillusionment signals (e.g. blockchain pilots failing to scale).



Gartner's Hype Cycle for digital technology, 2025

Innovation Trigger



Technologies showing high expert interest but low adoption remain in early hype cycle phases, as evidenced by strong growth signals but limited real-world deployment. Smart manufacturing and digital twins show a rapid 33 per cent market Compound Annual Growth Rate (CAGR) but remain largely at the pilot stage. Central Bank Digital Currency (CBDC) initiatives involve seven of 10 central banks yet are confined to controlled experimentation.⁷⁷ Autonomous vehicles appear in small-scale trials with emerging regulations but no mass deployment,⁷⁹ while quantum computing and post-quantum security receive increasing research and development funding in Malaysia, Singapore, and Thailand without commercial use cases.

Peak of Inflated Expectations



Technologies in this category exhibit intense media visibility, numerous pilots, and inflated expectations but have yet to demonstrate broad, sustainable deployment. Generative AI leads with a surge of over 300 per cent⁸⁰ and a 6–8 times rise in job postings, reflecting explosive attention that outpaces proven enterprise ROI.⁸¹ Drones for logistics and agriculture show expanding regulations and more than 50 government-led trials, yet commercial scaling remains limited.⁸² Augmented Reality/Virtual Reality (AR/VR) and immersive training solutions are growing at over 30 per cent annually with increasing education and training pilots, but everyday adoption remains modest despite significant hype.

Trough of Disillusionment



Blockchain for trade documents reflects a technology that initially promised transformative impact but has since lost momentum, with around 15 per cent of ASEAN pilots failing to scale and regional mentions declining by 40 per cent. The sharp contrast between early enthusiasm and limited real-world uptake places it firmly in a slowdown phase of the hype cycle.

Slope of Enlightenment



Technologies in this group show quiet but steady scaling, driven by clearer ROI and stronger governance rather than hype. AI-based cyber-threat detection is expanding with rising cybersecurity spending and significant government procurement. Embedded finance is growing rapidly toward a projected USD 30 billion market,⁸³ while national digital ID and eKYC systems now cover over 600 million citizens, cementing their role as core infrastructure.⁸⁴ Industrial IoT investments, robotics adoption, and smart-city deployments continue to increase, reflecting real operational value.⁸⁵ 5G networks are progressing despite uneven coverage,⁸⁶ telehealth systems are now mainstream in hospitals,⁸⁷ Electric Vehicle (EV) charging infrastructure is expanding quickly, and green data centres are gaining traction as sustainability becomes a regional priority.⁸⁸

78. Illes, A., Kosse, A., and Wierst, P. (2025). Advancing in tandem – results of the 2024 BIS survey on central bank digital currencies and crypto (BIS Papers No. 159). Bank for International Settlements

79. Sandbox To Society: Fostering Innovation In Southeast Asia (Tech for Good Institute, 2024)

80. NUS Observatory, 2024

81. Special Feature: ASEAN+3 and the Economic Impact of Generative AI (ASEAN+3 Regional Economic Outlook 2024)

82. Smart Agricultural Transformation in Asian Countries (Asian Productivity Organization, 2023)

83. Financial and Monetary Systems (World Economic Forum, 2025)

84. Advancing Digital Sustainability in Southeast Asia (Tech for Good Institute, 2025)

85. World Robotics 2025 – Industrial Robots (IFR Statistical Department, 2025)

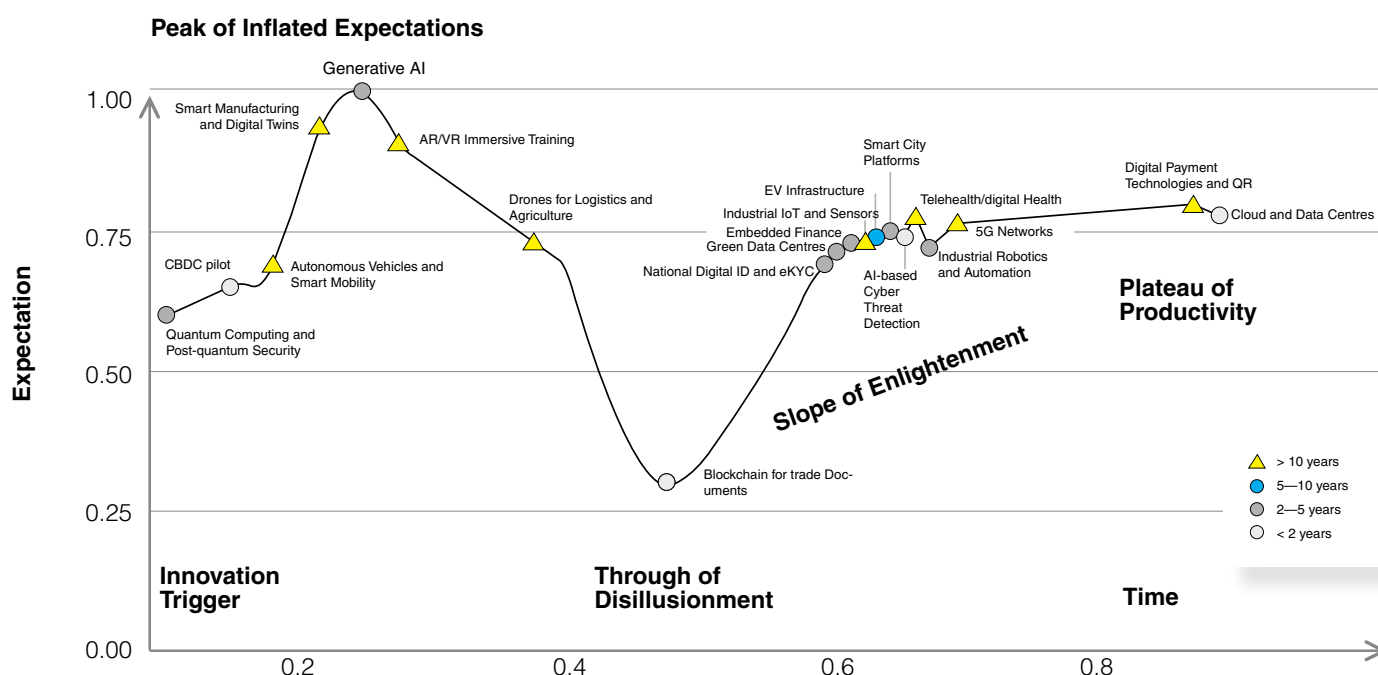
86. The State of 5G 2024 (GSMA Intelligence, 2024)

87. Digitalization of Public Service Delivery in Asia (Asian Productivity Organization, 2021)

88. Powering ASEAN's Digital Future: Data Centres as Strategic Infrastructure for Growth and Sovereignty (STT GDC, 2025)

Plateau of Productivity

Digital payment technologies and cloud infrastructure in ASEAN have reached a plateau of productivity, delivering stable, high-impact value with minimal hype. Quick Response (QR)-based payments now exceed 40 billion transactions annually—with Indonesia's Quick Response Code Indonesian Standard (QRIS) growing 120 per cent—showing deep integration and dependable, cross-border use.⁸⁹ Cloud services and data centres are similarly mature, supported by more than 150 new projects since 2021 and continued hyperscaler expansion, reflecting reliable performance and well-established economic returns.⁹⁰



Note: The data utilised represents global trend insights, analysed through the lens of ASEAN-related keywords.

Figure 16. Hype Cycle of Digital Technology
Created by the author

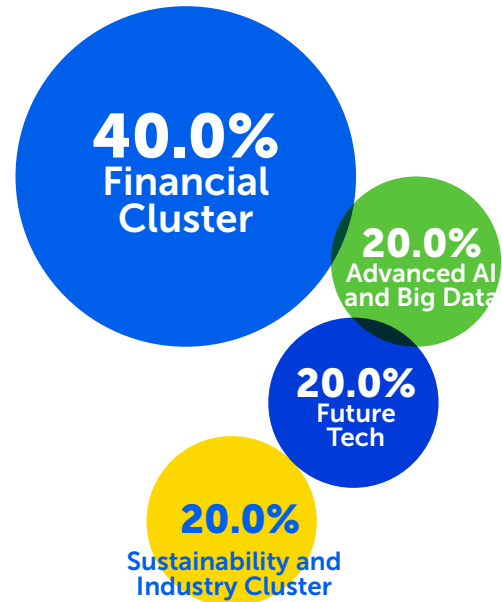
89. e-Conomy SEA 2024 (Google, Temasek, and Bain and Company, 2024)
90. Asia Pacific Data Centres (Savills, 2024)



Gartner's Hype Cycle and technology clusters

ASEAN's technology landscape signals a shift toward deeper digitalisation, stronger infrastructure, and rising capability demands across industries. In finance, the maturity of QR payments, e-wallets, fintech services, and national digital ID/eKYC is accelerating secure, seamless transactions, while CBDC pilots and blockchain-based trade systems point to early moves toward next-generation financial rails. Advanced AI and big data—including generative AI, machine learning, big data, and AI-driven cybersecurity—are redefining productivity and risk management, intensifying the need for stronger digital skills. Future technologies such as cloud computing, 5G, quantum research, and post-quantum security are becoming essential for scalability and long-term resilience. Meanwhile, sustainability-oriented solutions—digital twins, climate-focused tech, smart-city platforms, and emerging Web3 models—are expanding opportunities for efficiency and green innovation. Together, these shifts imply that industries must rapidly strengthen talent, adopt advanced digital systems, and modernise governance to remain competitive in an increasingly integrated and tech-driven ASEAN economy.

Participants





Key findings on technology emergence



After analysing the hype cycle, we found that technologies are spread across multiple stages of maturity, from early experimentation to widespread adoption. These stages reflect different levels of readiness, momentum, and real-world traction. The following sections outline where each technology currently stands within the hype cycle and what this distribution means for understanding overall technology emergence.



Emerging innovations with high expert attention but limited adoption.

Quantum computing and post-quantum security, CBDC pilots, and autonomous vehicles and smart mobility remain in the early-stage innovation phase. While expert interest is strong, real-world adoption is still nascent. Continued investment in research and stronger academia–industry collaboration are essential to advance maturity.



Technologies experiencing elevated hype and experimental deployments.

Smart manufacturing and digital twins, generative AI, AR/VR and immersive training, and drones for logistics and agriculture are currently in a high-visibility stage. Media coverage, pilots, and ambitious claims are widespread, but adoption pathways are still forming. Policymakers have an important role in guiding market readiness, strategic adoption, and ensuring these technologies are applied in more productive and value-generating ways.



Scaling technologies with increasing focus on ROI and governance.

National digital ID and eKYC, green data centres, embedded finance, industrial IoT and sensors, EV infrastructure, AI-based cyber threat detection, smart city platforms, telehealth/digital health, industrial robotics and automation, and 5G networks are undergoing steady, real-world scaling. These technologies show measurable value and require attention to governance, standards, and long-term sustainability.



Mature, stable technologies with substantial economic impact.

Digital payment technologies (including QR systems) and cloud and data centres have reached high maturity. They are dependable, broadly adopted, and deliver strong economic impact. Ongoing support should focus on expanding market penetration, deepening application use cases, and accelerating go-to-market strategies.

Policy Implications

The priority matrix serves as a strategic tool to assess and align innovations based on their business impact and maturity, providing valuable insights into which initiatives warrant prioritisation. The timeline for mainstream adoption varies significantly, and Gartner categorises this progression into four phases: less than two years, two to five years, five to 10 years, and more than 10 years.

We recommend five key technologies to be looked at further



Cloud and data centres fall into the category of mature, stable technologies with substantial economic impact

They are dependable, widely adopted, and deliver strong value across industries. They are dependable, widely adopted, and deliver strong value across industries through improved scalability, operational efficiency, and digital service delivery. In ASEAN, these technologies underpin everything from e-commerce and fintech to manufacturing and public services, making them essential infrastructure for economic competitiveness. The Asia-Pacific (APAC) cloud market projections: valued at USD 88.5 billion in 2024, projected to reach USD 368 billion by 2032 (CAGR: approximately 19.7 per cent).⁹¹



Green and AI-ready data centres are moving toward broader adoption as ASEAN economies prepare for the next wave of AI-driven growth.

Current facilities face surging compute demand driven by large-scale AI models, advanced analytics, and cloud-native operations. However, the transition to greener infrastructure remains challenging due to limited renewable energy availability and grid variability in several ASEAN markets. Even so, sustainability pressures and digital economy expansion are accelerating investment. Southeast Asia data centre investments: valued at USD 13.7 billion in 2024, projected to reach USD 30.5 billion by 2030.⁹²



Digital Payments/Open Finance: are also mature and economically impactful

Their widespread adoption supports financial inclusion, cross-border trade, MSME growth, and frictionless consumer transactions—key enablers of ASEAN's digital economy. With unified QR standards emerging in Indonesia, Singapore, Thailand, and Malaysia, the region is moving toward greater interoperability. Southeast Asia digital payments market: valued at USD 120 billion in 2023, projected to reach USD 306 billion by 2028 (CAGR: approximately 21 per cent).⁹³

91. Asia Pacific Cloud Computing Market (Fortune Business Insights, 2025)

92. Southeast Asia Data Center Market Landscape 2025–2030 (Arizton, 2025)

93. The Next Decade of Growth in Southeast Asia's Booming Digital Payments Ecosystem (Fintech News Singapore, 2025)



Cybersecurity

Likewise, it sits in the mature category and is increasingly vital as cyber threats escalate alongside digitalisation. Strong cybersecurity capabilities are foundational for protecting digital trade, financial services, critical infrastructure, and government systems in ASEAN. As enterprises adopt cloud, AI, and IoT, the need for advanced threat detection and resilient systems grows. APAC cybersecurity market: valued at USD 74.2 billion in 2025, projected to reach USD 141.0 billion by 2030 (CAGR: approximately 13.7 per cent).⁹⁴



Industrial IoT

Industrial IoT is positioned between the trough of disillusionment and the slope of enlightenment, signalling early scaling toward mainstream adoption. For ASEAN, Industrial IoT is central to manufacturing competitiveness, supply chain visibility, predictive maintenance, and productivity gains—especially given the region's ambition to strengthen its role in global manufacturing and smart industry. APAC IoT market: Projected to reach USD 842 billion by 2030 (CAGR: approximately 15.3 per cent).⁹⁵

Benefit	Years to Mainstream Adoption			
	< 2 years	2–5 years	5–10 years	> 10 years
High	Cloud and data centres	Green and AI-ready DCs		- Digital payments/ Open finance - Cybersecurity - Industrial IoT
High-Medium		AI and GenAI		
Medium			Blockchain/ Web3	
Medium/watch		Metaverse/ XR		

94. APAC Cyber Security Market Size and Share Analysis – Growth Trends and Forecasts (2025–2030) (Mordor Intelligence)

95. Asia Pacific Internet Of Things (IOT) Market Size and Outlook (Grand View Research)



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