Malaysia's National AI Trajectory: Catalyzing Digital Transformation and Charting Future Growth

1. Executive Summary

Malaysia is navigating a determined path towards becoming a significant Artificial Intelligence (AI) power, recognizing AI's transformative potential for economic growth and societal advancement. The nation's strategy has evolved from the foundational National AI Roadmap (AI-RMAP) 2021-2025, which aimed to kickstart an AI innovation ecosystem, to a more nuanced and collaborative national AI strategy co-created in 2025. This new strategy emphasizes a "uniquely Malaysian approach," rooted in local values and prioritizing human-centric AI development across seven key areas: governance and ethics, regulation and policy, advisory, safety, security, sovereignty, and talent.

Pivotal initiatives are driving this vision forward. The AI Sandbox ecosystem, encompassing the National Technology Innovation Sandbox (NTIS) – particularly its AI-focused stream with NVIDIA targeting 900 AI startups by 2026 – and sandboxes led by the National AI Office (NAIO) for public sector and governance experimentation, are crucial for fostering innovation. Flagship programs like "AI untuk Rakyat," mandating AI literacy for civil servants, and GovTech initiatives, including the large-scale deployment of Generative AI tools within the public sector, underscore a commitment to widespread AI acculturation and operational efficiency.

AI's economic impact is projected to be substantial, with estimates suggesting a contribution of USD 115 billion to Malaysia's GDP by 2030. Key sectors are already witnessing transformation. Manufacturing, especially the Electrical & Electronics (E&E) and palm oil industries, is leveraging AI for smart factories, predictive maintenance, and enhanced productivity, though SME adoption remains a challenge. Healthcare is benefiting from AI-driven diagnostics, improving accuracy in areas like lung cancer and diabetic retinopathy detection, with a focus on reducing long-term treatment costs. The financial services sector is rapidly adopting AI for fraud detection, personalized customer experiences, and operational efficiency, highlighted by the success of the National Fraud Portal. Office automation is advancing in both public and private sectors, with AI tools increasingly used for business process management, aiming to empower the workforce and streamline operations.

Critical enabling factors underpin this progress. Strong government commitment, manifested through comprehensive national policies, dedicated institutions like the Ministry of Digital and NAIO, and significant budgetary allocations, provides strategic direction. Substantial investments in digital infrastructure, including data centers and cloud capabilities (e.g.,

Microsoft's USD 2.2 billion investment), are laying the necessary groundwork. Public-Private Partnerships (PPPs) with global tech leaders and international collaborations, such as with Zhejiang University, are vital for knowledge transfer and ecosystem development. The espoused quadruple helix model (government, industry, academia, society) further aims to ensure holistic AI development.

However, Malaysia faces significant challenges. A critical AI talent deficit, with a projected demand for 30,000 AI professionals by 2030 against a current supply of around 3,000, is a major impediment. Complexities in data governance, gaps in privacy regulations concerning Automated Decision-Making (ADM), and emerging cybersecurity threats require urgent attention. Ethical considerations, including algorithmic bias, misinformation, and the environmental impact of AI, necessitate robust frameworks and public trust. Hurdles to SME AI adoption, primarily cost, lack of expertise, and infrastructure limitations, could hinder inclusive digital transformation. The existing digital divide also risks exacerbating inequalities if AI benefits are not equitably distributed.

Talent development is a key focus, with numerous initiatives spanning higher education curriculum reforms, new AI degree programs, TVET enhancements, and large-scale skilling programs like "AIForMYFuture." While these efforts are comprehensive, their long-term effectiveness and impact on job placement require more robust monitoring and evaluation.

To optimize Malaysia's AI journey, strategic recommendations include expediting robust AI governance and agile regulatory frameworks, concertedly bridging the talent chasm through enhanced education and industry collaboration, accelerating SME AI adoption via targeted support, fostering an ethical and trustworthy AI ecosystem through public awareness and technical safeguards, ensuring inclusive AI development by addressing the digital divide, and continuously optimizing the AI innovation ecosystem through streamlined support and sustained multi-stakeholder engagement. By navigating these complexities with foresight and commitment, Malaysia can realize its vision of a resilient, inclusive, and innovative AI-powered future.

2. Malaysia's National AI Blueprint: Strategy and Governance

Malaysia's ambition to harness the transformative power of Artificial Intelligence is underpinned by a structured and evolving national strategy, complemented by a developing governance and institutional framework. The nation's approach has matured from establishing foundational elements to embracing a more nuanced, collaborative, and ethically grounded vision for AI development and deployment.

2.1 The National AI Roadmap (AI-RMAP) 2021-2025: Foundational Strategy

The **Malaysia National Artificial Intelligence Roadmap (AI-RMAP) 2021-2025**, developed

by the Ministry of Science, Technology and Innovation (MOSTI), served as the initial cornerstone of the country's AI ambitions.[1] Its core objectives were to kickstart a thriving AI innovation ecosystem, encourage industry leaders and academicians to develop and implement AI solutions, and ultimately position Malaysia as a high-tech nation by 2030.[1] Recognizing the dynamic nature of AI, the AI-RMAP was conceived as a "living document," intended for continuous revision to remain relevant amidst technological and environmental changes.[1]

The AI-RMAP outlined several key strategic thrusts, including the critical tasks of establishing AI governance, fostering AI acculturation across society, and initiating a vibrant AI ecosystem.[3] Central to achieving these goals was the **AI Innovation Ecosystem (AI-IE) Framework**. This framework envisioned an **AI Innovation Hub**, also known as the AI-Catalyst, which would leverage **quadruple helix collaboration**—uniting government, industry, academia, and society—to expedite the implementation of national AI use cases and elevate Malaysia's standing on the global AI map.[1]

A significant aspect of the AI-RMAP was its emphasis on responsible AI development, guided by **seven core principles**: Fairness, Reliability, Safety and Control, Privacy and Security, Pursuit of Human Benefit and Happiness, Accountability, and Transparency.[3] These principles, designed to foster trusted and privacy-conscious AI, align Malaysia with global best practices, such as the OECD AI Principles and Singapore’s Model AI Governance Framework.[4]

To propel AI adoption, the roadmap identified national AI use cases across key sectors including supply chains, healthcare, education, agriculture, and finance.[2] It also recommended embarking on fundamental and applied research and development (R&D) within the AI innovation ecosystem and encouraging AI adoption in R&D across all fields.[3] The implementation and coordination of the AI-RMAP's action plan were entrusted to the **National Blockchain and Artificial Intelligence Committee**, established by MOSTI.[2]

2.2 Evolving National AI Strategy (Post-2025): A Collaborative and Values-Driven Approach

Building on the foundations laid by the AI-RMAP, Malaysia embarked on a new phase in 2025 to co-create its next national AI strategy. This evolution reflects a maturing understanding of AI's complexities and a commitment to a more inclusive and ethically robust approach. In a significant move, 210 experts from Malaysia and around the world, representing diverse fields such as tech entrepreneurship, civil service, ethics, academia, and AI practice, were convened into working groups.[6] Their mandate is to collaboratively shape an AI future that is not only innovative but also deeply rooted in Malaysian values, voices, and lived experiences, aiming for tangible benefits for businesses, communities, and citizens.[6]

This co-creation process follows a dynamic three-month sprint structure, launched in February 2025. It includes key checkpoints for alignment and knowledge exchange, with the

first draft deliverables presented in April 2025. The process is set to culminate in May 2025, with fully refined outputs presented to the National AI Office (NAIO). These outputs will form the backbone of Malaysia's new national AI roadmap, with the full strategy anticipated for unveiling later in 2025.[6]

The new strategy is being developed around **seven key priority areas**, indicating a comprehensive and forward-looking agenda:

1. **AI governance and ethics:** Ensuring a human-centered approach aligned with national values.
2. **AI regulation and policy:** Proposing a structured regulatory framework to support the national vision.
3. **AI advisory:** Promoting increased AI adoption in local businesses.
4. **AI safety:** Prioritizing protection against unintended AI harms.
5. **AI security:** Identifying and mitigating priority risks from external threats.
6. **AI sovereignty:** Ensuring Malaysia's long-term strategic autonomy in AI.
7. **AI talent:** Developing a robust AI talent pipeline to cultivate local expertise.[6]

The guiding philosophy for this new chapter is to build a "uniquely Malaysian approach, one that empowers our people, protects their rights, and ensures no one is left behind," while being regionally relevant and globally competitive.[6] This shift from a primarily ecosystem-kickstarting phase to one focusing on applied, ethical, and sovereign AI governance signifies a deeper engagement with the multifaceted implications of AI.

2.3 Synergies with National Development Agendas

Malaysia's AI strategy does not exist in isolation; it is intricately woven into the fabric of broader national development policies, ensuring alignment and mutual reinforcement.

- The **National Policy on Fourth Industrial Revolution (4IR)**, developed in 2021, serves as a comprehensive national strategy for embracing the 4IR. It is aligned with the National Science, Technology and Innovation Policy (DSTIN) 2021–2030 and provides guiding principles for ministries and agencies to optimize resource allocation and manage emerging risks associated with 4IR technologies, including AI.[2]
- The **National Science, Technology and Innovation Policy (DSTIN) 2021–2030** aims to intensify the development of local technology, with the AI-RMAP directly supporting its objectives.[1]
- The **10-10 Malaysia Science, Technology, Innovation, and Economy Framework (10-10 MySTIE)**, an initiative under DSTIN developed by the Academy of Sciences Malaysia (ASM), specifically targets boosting economic development, innovation, wealth generation, societal inclusion, and overall well-being through STI, with AI playing a pivotal role.[1]
- Furthermore, the National 4IR Policy supports overarching national development plans such as the **Twelfth Malaysia Plan** and the **Shared Prosperity Vision 2030**. It also complements the **Malaysia Digital Economy Blueprint** in driving the growth of the

digital economy and bridging the digital divide across the nation.[2]

This interconnectedness ensures that AI development contributes directly to Malaysia's larger socio-economic goals, positioning AI as a critical enabler for national progress.

2.4 Institutional Framework: Orchestrating AI Advancement

A dedicated institutional framework has been established to drive and coordinate Malaysia's AI agenda, reflecting the government's commitment to this transformative technology.

- The **Ministry of Digital**, established in 2024, now spearheads the national digital transformation agenda, which prominently features AI as a core component.[2]
- Under the Ministry of Digital, the **National AI Office (NAIO)** was established in December 2024.[2] The NAIO is tasked with positioning Malaysia as a key AI player within ASEAN and globally. Its focus includes enhancing AI capabilities, promoting cross-sector collaboration, supporting AI integration across various frameworks, and shaping AI policies, governance, and investment strategies.[2] The NAIO employs a dual strategy of actively driving AI implementation in industry while concurrently strengthening the regulatory landscape.[7] It also aims to assist startups and businesses in navigating available funding and incentive schemes.[7] Key initiatives under NAIO include the AI Technology Action Plan 2026–2030, an AI Adoption Regulatory Framework, an AI Code of Ethics, and Public Sector AI Adaptation Guidelines.[4] The NAIO is also overseeing the development of the new national AI strategy.[6]
- The **Ministry of Science, Technology and Innovation (MOSTI)** has historically been central to Malaysia's AI strategy, having developed the AI-RMAP 2021-2025 and introduced the National Guidelines on AI Governance and Ethics.[3] MOSTI is also in the process of developing a national AI Code of Ethics in collaboration with various stakeholders.[5]
- The **Malaysian Digital Economy Corporation (MDEC)** plays a crucial role in driving the digital economy. MDEC actively supports AI solution providers, fosters AI adoption, particularly among Small and Medium Enterprises (SMEs), and facilitates international partnerships, such as its collaboration with Zhejiang University.[4]
- The **Malaysian Research Accelerator for Technology and Innovation (MRANTI)** serves as the lead secretariat for the National Technology Innovation Sandbox (NTIS) and is deeply involved in AI Sandbox initiatives and fostering the commercialization of innovations.[5]

The active involvement of these multiple agencies underscores a comprehensive governmental effort. However, the overlapping mandates, particularly in areas like ethical guideline development (with both MOSTI and NAIO having initiatives), necessitate robust inter-agency coordination and clear delineation of responsibilities to prevent fragmentation and ensure a unified national approach. The success of the espoused quadruple helix model depends significantly on this internal governmental coherence.

2.5 Ethical and Governance Frameworks: Ensuring Responsible AI

Recognizing the profound societal implications of AI, Malaysia has placed a strong emphasis on establishing ethical and governance frameworks to guide its responsible development and deployment.

- MOSTI introduced the **National Guidelines on AI Governance and Ethics**, a non-legally binding framework aimed at promoting responsible and ethical AI development and deployment across all sectors. These guidelines are designed for AI end-users, policymakers, and developers/providers.[4] They are built upon seven core principles: Fairness, Reliability (including Safety and Control), Privacy and Security, Inclusiveness, Transparency, Accountability, and the Pursuit of Human Benefit and Happiness.[3]
- A more formal **AI Code of Ethics** is being developed by MOSTI, in collaboration with Universiti Teknologi Malaysia (UTM), government agencies, higher education institutions (HEIs), and industry players. This code was anticipated to be ready by 2024 and is expected to form the basis of AI regulation in the country.[4] Complementing this, the National Tech Association of Malaysia (PIKOM) released its "AI Ethics & Governance 2025" framework, an update to its 2024 policy, which addresses emerging challenges like generative AI, sustainability, and workforce transformation, while upholding similar ethical principles.[13]
- The government, through MOSTI, is also examining the necessity of enacting a specific **AI Act** to provide a comprehensive legal underpinning for AI governance.[5]

Despite these proactive steps, Malaysia's legal framework for AI is still in its nascent stages.[4] A notable regulatory gap exists concerning Automated Decision-Making (ADM). Malaysia's Personal Data Protection Act 2010 (MY PDPA) does not yet explicitly regulate ADM, which is an increasingly critical aspect of AI adoption, especially in sectors like finance (credit scoring) and employment (screening).[4] This lack of specific regulation can create ambiguity and leave individuals without clear recourse when affected by AI-driven decisions.[4]

Public discourse on AI ethics is being encouraged, with efforts to launch national discussions and align with international norms and frameworks, such as those from UNESCO and ASEAN.[14] There is a recognized concern about the potential misuse of AI, particularly in generating misinformation that could impact public discourse and stability.[16] The proactive establishment of ethical guidelines is a positive step, but the rapid evolution of AI technologies, especially Generative AI, demands an agile and adaptive regulatory environment. The "living document" principle of the AI-RMAP [1] needs to be actively applied to all AI-related policies and regulations to ensure they remain effective and relevant in the face of fast-paced technological advancements and emerging ethical dilemmas.

Table 1: Malaysia's Core AI Strategic Frameworks and Governance Bodies

Framework/Body	Issuing/Establish	Key Strategic	Core	Key Snippet

	ing Entity & Year	Goals/Mandate	Principles/Priorities	ID(s)
National AI Roadmap (AI-RMAP) 2021-2025	MOSTI (2021)	Kickstart AI innovation ecosystem, encourage AI solution development & implementation, position Malaysia as a high-tech nation.	7 Responsible AI Principles (Fairness, Reliability, Safety, Privacy, Human Benefit, Accountability, Transparency).	[1]
Evolving National AI Strategy (Post-2025)	Ministry of Digital / NAIO (Co-creation process initiated 2025)	Develop a uniquely Malaysian AI future, empower people, protect rights, ensure inclusivity.	7 Priority Areas: AI governance & ethics, AI regulation & policy, AI advisory, AI safety, AI security, AI sovereignty, AI talent.	[6]
National 4IR Policy	Economic Planning Unit, Prime Minister's Department (2021)	Comprehensive national strategy for 4IR, optimize resource allocation, manage emerging risks.	Aligned with DSTIN 2021–2030, supports national development policies.	[2]
Ministry of Digital	Government of Malaysia (2024)	Spearhead national digital transformation agenda, including AI.	Enhance AI capabilities, promote cross-sector collaboration, support AI integration.	[2]
National AI Office (NAIO)	Ministry of Digital (Dec 2024)	Position Malaysia as a key AI player; shape AI policies, governance, investment	AI Technology Action Plan 2026–2030, AI Adoption Regulatory Framework, AI	[2]

		strategies; drive AI implementation & strengthen regulation.	Code of Ethics.	
Ministry of Science, Technology and Innovation (MOSTI)	Government of Malaysia	Historically central to AI strategy; introduced National Guidelines on AI Governance & Ethics; developing AI Code of Ethics.	Promote responsible and ethical AI development and deployment.	[3]
National Guidelines on AI Governance and Ethics	MOSTI	Non-legally binding framework for responsible AI development & deployment.	7 Core Principles (Fairness, Reliability, Privacy, Inclusiveness, Transparency, Accountability, Human Benefit).	[4]
Forthcoming AI Code of Ethics (MOSTI)	MOSTI (Expected 2024, in development)	Form the basis of AI regulation in Malaysia.	Based on responsible AI principles.	[5]
PIKOM AI Ethics & Governance Framework 2025	PIKOM (2025)	Guide tech industry on ethical AI, addressing generative AI, sustainability, workforce transformation.	Fairness, Transparency, Accountability, Privacy, Sustainability, Inclusivity, Human Benefits.	[13]

This consolidated overview of Malaysia's AI strategic frameworks and governance bodies illustrates the multi-layered approach the nation is taking. It highlights a clear progression from foundational strategies to more nuanced governance, driven by a variety of dedicated institutions. Understanding this complex landscape is crucial for appreciating the context of specific AI initiatives and their potential impacts.

3. Pivotal AI Initiatives: Fostering Innovation and Adoption

Malaysia is actively implementing a range of strategic initiatives designed to cultivate a vibrant AI ecosystem, accelerate innovation, and promote widespread AI adoption across

various sectors. These initiatives span from experimental sandboxes that allow for controlled testing of new technologies to broad-based programs aimed at acculturating the populace and public sector to AI.

3.1 The AI Sandbox Ecosystem: Accelerating Innovation through Experimentation

AI Sandboxes are instrumental in Malaysia's strategy, providing controlled environments where new AI technologies, practices, and governance models can be tested and refined. This approach helps to reduce regulatory uncertainty and fosters responsible innovation by allowing experimentation before wider deployment.[17]

- **National Technology Innovation Sandbox (NTIS):** Launched in August 2020 and spearheaded by MOSTI with MRANTI as the lead secretariat, NTIS allows researchers, innovators, and entrepreneurs to test their products and services in a live environment under relaxed regulatory conditions, often with access to grants.[18] The overarching goals of NTIS include reducing dependency on foreign labor, increasing high-skilled job opportunities, boosting GDP and Gross National Income (GNI), enhancing private sector investment in R&D, and improving the nation's commercialization rate.[18] NTIS prioritizes innovations aligned with the 10 science and technology drivers of the 10-10 MySTIE framework, covering key socio-economic sectors such as Agriculture & Forestry, Medical & Healthcare, Smart Engineering & Manufacturing, and Smart Cities & Transportation.[18]
    - A significant development under NTIS is the **NTIS AI Sandbox**, launched in April 2024 in collaboration with NVIDIA. This dedicated AI stream aims to substantially boost AI adoption, with ambitious targets of creating 900 AI startups by 2026 and nurturing over 13,000 new AI talents within the same timeframe.[11] Participants in the AI Sandbox gain access to specialized laboratory facilities and benefit from NVIDIA's AI-related capability-building programs, optimizing the testing process for AI solutions.[11] While specific outcomes from the AI Sandbox are yet to be detailed due to its recent launch, general NTIS success stories include companies like Aerodyne and Poladrone (in Unmanned Aircraft Systems operations), AdvanLED (AI Traffic Melaka project), HelloWorld Robotics (autonomous delivery solutions), Akar Indah Engineering (smart waste management systems), and Braintree Technologies (AI robotics for agriculture).[20] These examples illustrate the diverse range of innovations being fostered.
- **National AI Office (NAIO)-led AI Sandboxes:** The NAIO is also actively establishing sandboxes, particularly focusing on public sector applications and AI governance.
    - NAIO creates sandboxes specifically for public agencies to test AI solutions in a controlled environment, facilitating their adoption of AI.[7]
    - In a key partnership, NAIO is collaborating with Microsoft to develop an **AI Governance Sandbox framework**.[21] This indicates that sandboxes are being

utilized not just for product testing but also for shaping the rules and ethical guidelines governing AI.
    - The **"NAIO Lab"** initiative represents another facet of this strategy. "Rakan Tani," an AI platform for agriculture, is the first project launched under NAIO Lab. This lab provides a collaborative space for AI experts, researchers, and entrepreneurs, offering both technical and financial support. The focus is on citizen-centric AI applications in critical sectors like agriculture, healthcare, and transportation.[22]
- **Specialized Regulatory Sandboxes (with AI relevance):**
    - The **Securities Commission (SC) Malaysia's Regulatory Sandbox** is designed to foster Fintech innovation within the capital markets.[23] Applications for this sandbox were scheduled to open from April 15 to May 31, 2025.[23] It aims to allow the testing of innovative capital market products or services that are not currently available in Malaysia or do not fit neatly into existing regulatory frameworks. The SC's sandbox prioritizes innovations that enhance financial inclusiveness, cater to the needs of Islamic finance, improve retirement solutions, or boost overall market efficiency.[24] While not exclusively for AI, the SC has shown keen interest in AI and blockchain technologies, as evidenced by the focus of its SCxSC Fintech Summit in October 2024.[23] This sandbox is thus highly relevant for the testing of AI-driven Fintech solutions.

This multi-pronged sandbox strategy, encompassing broad national platforms like NTIS, public-sector focused environments by NAIO, and industry-specific regulatory sandboxes like the SC's, reflects an understanding of the diverse needs across the innovation spectrum. It allows for tailored support, from nurturing early-stage ideas to testing market-ready solutions under regulatory scrutiny, and exploring AI's role in public service delivery and governance.

3.2 Flagship Programs for AI Acculturation and Application

Beyond sandboxes, Malaysia has launched flagship programs aimed at embedding AI knowledge and applications within the government and among the general populace.

- **AI untuk Rakyat (AI for People) Programme:** This initiative is designed to enhance AI skills and awareness broadly across the Malaysian public. It specifically targets underserved groups, including the B40 community, Persons with Disabilities (PWD), women, and the unemployed, ensuring inclusivity in AI literacy.[2] The program involves collaborations with industry giants like Intel and the MCMC Microsoft AI TEACH Programme.[2] A cornerstone of "AI untuk Rakyat" is the provision of courses such as "AI Aware" and "AI Appreciate." These courses are offered in four local languages and, significantly, are free and compulsory for all government servants.[3] This mandate for civil servants represents a substantial commitment to building AI literacy from within the public sector, which can act as a catalyst for wider societal adoption and informed policymaking.

- **GovTech Initiatives:** Malaysia is advancing its Government Technology (GovTech) agenda to modernize public services. A concept paper for GovTech outlines a vision for a single platform offering integrated government services, leveraging sophisticated and inclusive digital technologies, which inherently implies the use of AI for efficiency and personalization.[3]
    - Practical implementation of this is seen through NAIO's **Public Sector AI Adaptation Guidelines** and the widespread rollout of Google Workspace's Gemini Suite (a Generative AI tool) to 445,000 public officers.[4]
    - The **"AI at Work 2.0"** program, a joint effort by the Ministry of Digital and Google Cloud, has already trained 270 public officers from various government agencies on the use of Generative AI tools. The program reported that over 90% of participants indicated these tools had enhanced their work quality and efficiency.[7] This demonstrates the immediate applicability and perceived benefits of AI in public administration.
- **Malaysia Techlympics Programme:** To cultivate interest and expertise in technology among the youth, the Malaysia Techlympics programme has been allocated MYR 10 million. This initiative focuses on fostering local talent in robotics and AI from an early age, contributing to the long-term AI talent pipeline.[2]

The strong emphasis on public sector AI literacy and adoption, as seen in "AI untuk Rakyat" and the extensive GenAI deployment, is a strategic move. It not only aims to improve the efficiency and effectiveness of public services but also creates a significant internal demand for AI solutions. This can, in turn, stimulate the local AI industry and provide a model for private sector adoption. Furthermore, the evolution of sandboxes from general technology support (NTIS initial phase) to more specific AI fostering with measurable targets (NTIS AI Sandbox, NAIO Lab) indicates a maturing strategy. This targeted approach is crucial for channeling resources effectively and accelerating development in areas of high strategic importance like AI. The use of sandboxes is also expanding beyond just commercial product testing to include the development and refinement of AI governance and ethical frameworks, as seen in NAIO's partnership with Microsoft for an AI Governance Sandbox.[21] This practical approach to governance development is vital for creating adaptive and effective regulatory environments.

Table 2: Overview of Major Malaysian AI Initiatives

Initiative Name	Lead Agency/Key Partners	Key Objectives & Focus	Target Beneficiaries/ Sectors	Stated Targets/Outcomes (if available)	Key Snippet ID(s)
National Technology Innovation	MOSTI, MRANTI	Accelerate innovation to market, reduce	Researchers, innovators, entrepreneurs	910 applications received, 217	[18]

Sandbox (NTIS)		foreign labor dependency, create high-skilled jobs, boost GDP/GNI, improve commercialization.	across various sectors (Agriculture, Healthcare, Smart Manufacturing etc.).	approved solutions.[18]	
NTIS AI Sandbox	MOSTI, MRANTI, NVIDIA	Boost AI adoption, foster AI innovation and talent.	AI Startups, Tech Innovators, AI talent.	Create 900 AI startups by 2026, develop over 13,000 AI talents by 2026.	[11]
NAIO Public Sector Sandbox / NAIO Lab	National AI Office (NAIO)	Test AI solutions for public agencies in a controlled environment; foster citizen-centric AI applications.	Public agencies; AI experts, researchers, entrepreneurs. First project: Rakan Tani (Agriculture).	Focus on agriculture, healthcare, transportation.	[7]
AI Governance Sandbox Framework	NAIO, Microsoft	Develop and test AI governance frameworks.	Policymakers, regulatory bodies, AI developers.	N/A (framework development)	[21]
Securities Commission (SC) Fintech Regulatory Sandbox	Securities Commission Malaysia	Test innovative capital market products/services not fitting existing frameworks.	Fintech companies, innovators in capital markets.	Focus on financial inclusiveness, Islamic finance, retirement solutions. Applications April-May 2025.	[23]
AI untuk Rakyat (AI for People)	Ministry of Digital, Intel, MCMC	Enhance AI skills and awareness	General public (esp. underserved	Courses "AI Aware" & "AI Appreciate"	[2]

	Microsoft AI TEACH Programme	among public and civil servants.	groups), all government servants.	compulsory for civil servants.	
GovTech Initiatives (Public Sector AI Adaptation)	Ministry of Digital, NAIO, Google Cloud	Streamline government operations, enhance citizen engagement, integrate digital services.	Public sector agencies, civil servants, citizens.	Rollout of Gemini Suite to 445,000 public officers; AI at Work 2.0 trained 270 officers (>90% reported efficiency gains).	[3]
Malaysia Techlympics Programme	Government (Budget allocation)	Cultivate youth expertise in robotics and AI.	Youth, students.	MYR 10 million allocation.	[2]

This table provides a structured summary of the diverse AI initiatives, highlighting their objectives, target groups, and, where available, specific outcomes or targets. It underscores the comprehensive approach Malaysia is taking to nurture its AI ecosystem from multiple angles, including innovation support, public sector adoption, and broad-based literacy.

4. AI's Transformative Impact on Malaysian Industries

Artificial Intelligence is rapidly emerging as a pivotal force in Malaysia's economic landscape, with projections indicating a significant contribution to national productivity and growth. The government and industry stakeholders are increasingly recognizing AI's potential to revolutionize key sectors, driving efficiency, innovation, and new value creation.

4.1 Macroeconomic Projections: AI's Significant Economic Dividend

The anticipated economic impact of AI on Malaysia is substantial. Projections suggest that AI could contribute as much as **USD 115 billion** (approximately RM530 billion) to Malaysia's productive capacity or overall economy by the year 2030.[4] This figure is particularly noteworthy as it is equivalent to roughly 25% of Malaysia's Gross Domestic Product (GDP) in 2022.[28] Delving deeper, Generative AI alone is estimated to have the potential to unlock USD 113.4 billion in productive capacity within the Malaysian economy.[29]

Early indicators of this burgeoning AI economy are already visible. The Malaysian Digital Economy Corporation (MDEC) has reported that 140 AI solution providers within its ecosystem have collectively generated MYR 1 billion in revenue, showcasing the growing commercial viability of AI technologies in the country.[4] Further market analysis projects that the AI market in Malaysia will reach USD 797.40 million in 2024 and is expected to grow at a

compound annual growth rate (CAGR) of 28.50% to achieve a value of USD 3.59 billion by 2030.[19] These figures collectively paint a picture of a rapidly expanding AI sector poised for significant economic influence.

4.2 Manufacturing: Spearheading AI-Driven Industrial Revolution

The manufacturing sector, a cornerstone of the Malaysian economy, is at the forefront of AI adoption, leveraging these technologies to embrace the principles of Industry 4.0. AI is enabling intelligent automation, advanced robotics, and the seamless integration of cyber-physical systems across production lines.[30] It is anticipated that the implementation of Generative AI in the manufacturing sector will contribute nearly half of the potential economy-wide gains from this technology.[29] Furthermore, the adoption of smart factory technologies, powered by AI, could potentially increase production capacity by up to 20% and reduce operational costs by up to 15%.[31]

- **Electrical & Electronics (E&E) Sector:** The E&E sector is a critical driver of Malaysia's economic output, contributing 5.8% to the national GDP in 2023, valued at RM107 billion, and holding a significant 13% share of the world's back-end semiconductor market.[32] This sector is forecasted to grow to RM120 billion by 2025.[32] AI applications are being deployed for visual inspections, enhancing smart factory operations, and enabling predictive maintenance.[32] However, the adoption of these advanced technologies is predominantly led by multinational corporations (MNCs) due to their greater financial capacity, while Small and Medium Enterprises (SMEs) often face challenges related to high investment costs.[32] Projections indicate that the E&E industry's contribution to Malaysia's GDP is expected to exceed 8% by 2030 [33], with the global AI semiconductor market itself projected to reach $119.4 billion by 2027.[33]
- **Palm Oil Industry:** Malaysia has launched the world’s first AI-driven palm oil mill. This innovative facility utilizes predictive analytics, automation, and real-time data monitoring to significantly increase productivity, reduce its environmental footprint, and lessen the industry's traditional reliance on foreign labor. It is estimated that nationwide adoption of such AI technologies could reduce foreign labor dependency by up to 35%.[4]
- **Other Manufacturing Applications:** The broader AI in Smart Manufacturing market in Malaysia is projected to experience a CAGR of approximately 12–15% between 2023 and 2030.[30] Key trends include the increasing use of autonomous robots and collaborative robots (cobots) working alongside human operators, and the integration of AI with Internet of Things (IoT) sensors and edge computing devices to enable real-time analytics on the factory floor.[30] A notable example is Clarion Malaysia's successful trial of the nation's first 5G-enabled manufacturing line, showcasing the convergence of AI and advanced connectivity.[31]

The significant projected gains in manufacturing highlight AI's potential to enhance

Malaysia's industrial competitiveness. However, the disparity in adoption rates between MNCs and SMEs suggests a critical need for targeted interventions to support SMEs in overcoming barriers such as cost and lack of expertise, ensuring that the benefits of AI are broadly distributed across the sector.

4.3 Healthcare: Enhancing Diagnostics, Treatment, and Accessibility

The Malaysian healthcare sector is increasingly embracing AI to improve service delivery, diagnostic accuracy, and patient outcomes. The healthcare services market in Malaysia is projected to exceed $48 billion by 2028.[34] More specifically, the AI healthcare market in Malaysia is anticipated to witness substantial growth, from USD 10 million in 2022 to an estimated USD 220 million by 2030, reflecting a remarkable CAGR of 45.42%.[35] The medical devices market, often incorporating AI, is also on an upward trajectory, with projected revenues of USD 3.31 billion in 2024, expected to reach USD 4.75 billion by 2029 (a CAGR of 7.51%).[36]

- **Diagnostics:** AI is making significant inroads in medical diagnostics.
    - AI-assisted screening tools have demonstrated higher accuracy than traditional methods in detecting lung abnormalities, with sensitivity rates ranging from 56.4% to 95.7% compared to radiologists' 23.2% to 76%.[4] A notable achievement includes the diagnosis and treatment of Malaysia's first lung cancer case using AI, a collaboration between the Lung Cancer Network of Malaysia (LCNM) and AstraZeneca Malaysia.[4]
    - The Ministry of Health has unveiled "DR. MATA," an AI-powered diagnostic tool specifically designed for the detection of diabetic retinopathy, a leading cause of blindness among diabetics.[4]
    - The integration of AI in X-ray analysis has been shown to improve the detection rates of radiology trainees by 15.5%.[34] This was highlighted in a 2022 MaHTAS health technology assessment.
    - The credibility of AI-enhanced CT image analysis was further bolstered by its use during the COVID-19 pandemic.[34]
    - In breast cancer diagnostics, AI-enhanced mammogram screenings have achieved consistently higher sensitivity rates compared to radiologists working independently.[37]
- **Operational Efficiency & Patient Management:** AI is also being deployed to streamline healthcare operations and improve patient management. AI tools such as chatbots and virtual assistants are being used to alleviate the workload of healthcare workers, a long-standing challenge in Malaysia's public healthcare system.[4] Public health clinics are undergoing digital transformation with the rollout of cloud-based digital management systems (CCMS).[4] There is also governmental interest in AI-enhanced solutions for clinical decision support and optimizing hospital workflows.[34]

The overarching goals for AI in Malaysian healthcare include improving the early detection of

critical diseases like cancer and tuberculosis, enhancing the overall patient experience and outcomes, and reducing long-term treatment costs through early and precise diagnostics.[34] While these early successes in diagnostics are promising, many initiatives are still in pilot stages. The key challenge lies in scaling these solutions nationwide, seamlessly integrating them into routine clinical workflows, and ensuring they contribute to bridging healthcare access gaps, particularly for rural and underserved populations where specialized medical expertise may be limited.[37]

4.4 Financial Services: Revolutionizing Fintech, Security, and Customer Experience

The financial services sector in Malaysia is a rapid adopter of AI, driven by the technology's potential to enhance security, personalize customer experiences, and improve operational efficiencies. The AI in Fintech market in Malaysia was valued at USD 1.9 billion in 2023 and is projected to grow to USD 3.11 billion by 2030, at a CAGR of 7.30%.[39]

- **Fraud Detection & Security:** AI is widely adopted by Financial Service Providers (FSPs) for robust fraud detection and security enhancement. A significant initiative is the **National Fraud Portal (NFP)**, launched in August 2024 in partnership with PayNet and other financial institutions. The NFP utilizes AI for predictive analysis to combat financial fraud, enabling financial institutions and the National Scam Response Centre (NSRC) to swiftly identify, trace, and freeze suspicious transactions. This has impressively reduced the time taken to trace stolen funds by 75%, from two hours down to just 30 minutes.[4] AI is also extensively used in Anti-Money Laundering (AML) efforts and for electronic Know-Your-Customer (e-KYC) processes.[4]
- **Customer Service & Engagement:** AI-driven solutions are transforming how financial institutions interact with their customers. AI-powered chatbots provide 24/7 personalized assistance, improving response times and customer satisfaction.[40] Notably, nearly half of Malaysian consumers now indicate a preference for interacting with brands through AI.[31] Generative AI tools are also showing potential to save up to 40% of the time spent on marketing processes within the financial sector.[41]
- **Operations & Decision Making:** AI technologies are being applied to various core banking operations, including credit underwriting, customer analytics, trading, and technology risk management.[4] Financial institutions increasingly rely on Big Data analytics and AI-driven insights for developing investment strategies and conducting credit risk analysis.[42]

Key trends in the Malaysian AI-Fintech landscape include the rise of automated wealth management services, personalized financial advice driven by AI, and hyper-personalization of financial products and services.[39] Digital innovation, embedded finance (integrating financial services into non-financial platforms), and AI-driven personalization are collectively reshaping the industry.[41] Cloud deployment is the dominant model for AI in Fintech,

accounting for approximately 60% of the market share, due to its scalability and cost-effectiveness.[39] This rapid adoption is driven by tangible benefits, but as AI becomes more deeply embedded in critical financial decisions, the existing regulatory gaps, such as the PDPA's current silence on ADM [4], become increasingly pertinent. The SC's Fintech Sandbox is a positive development [23], but broader regulatory evolution is necessary to ensure consumer protection, data privacy, and overall financial stability in an AI-driven era.

4.5 Other Key Sectors

AI's transformative influence extends beyond the primary sectors of manufacturing, healthcare, and finance into other vital areas of the Malaysian economy and society.

- **Agriculture:** The agricultural sector is being modernized through AI. The **Rakan Tani** digital platform, a flagship project under the NAIO Lab, utilizes AI-powered order matching to help farmers secure buyers early in the crop cycle. This system ensures competitive pricing based on projected yields, thereby promoting financial stability and predictability for farmers.[4] AI-powered tools are also being introduced for precision farming, optimizing crop yields and resource management.[27] An example of international collaboration in this area is the integration of Toshiba's Weather Forecast AI technology into the Smart Farming Project in Kedah's Muda region.[21]
- **Public Services & Smart Cities:** AI is a key driver in Malaysia's Smart City Framework, guiding local authorities in planning and developing smarter urban environments.[4] In Kuala Lumpur, an extensive citywide CCTV network employs AI platforms to count and classify vehicles and recognize license plates, enabling real-time traffic analysis for optimizing traffic flow and infrastructure planning.[4] The Road Transport Department (JPJ) also plans to use AI-driven systems to detect and prevent traffic offenses, aiming for faster response times and improved road safety.[4] Putrajaya has seen the launch of 5G-enabled autonomous buses equipped with advanced sensor technology.[31] Furthermore, broader GovTech initiatives aim to create integrated digital government services, leveraging AI for enhanced efficiency and citizen experience.[3]
- **Education:** AI is being explored for personalized learning solutions.[27] A project involving robots, IoT systems, and AI/machine learning is underway for species digitalization and analysis, including an ecology simulator for AI-infused forest management, which also incorporates training programs.[3]

These cross-sectoral AI applications, such as Rakan Tani improving farmer livelihoods and Smart City initiatives enhancing urban living, demonstrate AI's potential to deliver broader societal impact beyond purely economic gains. These align with the national AI ethics principle of pursuing human benefit and happiness.[3] The success and visibility of such projects can play a crucial role in building public trust and showcasing the wider value proposition of AI for the nation.

Table 3: Current and Projected Impact of AI in Key Malaysian Industries

Sector	Key AI Applications (Current & Emerging)	Reported/Projected Economic Impact	Key Success Stories/Initiatives	Major Challenges/Considerations for AI in this Sector	Key Snippet ID(s)
Overall Economy	Cross-sectoral adoption	USD 115bn (RM530bn) to productive capacity by 2030. GenAI alone: USD 113.4bn. AI Market: USD 3.59bn by 2030 (CAGR 28.50%).	140 AI solution providers: RM1bn revenue.	Talent gap, SME adoption, data governance, ethical concerns.	[4]
Manufacturing (General)	Intelligent automation, advanced robotics, smart factories, predictive maintenance, Industry 4.0 integration.	GenAI in manufacturing: ~50% of economy-wide gains. Smart factories: +20% capacity, -15% costs. AI in Smart Mfg Market: 12-15% CAGR (2023-2030).	Clarion Malaysia's 5G manufacturing line.	High investment costs for SMEs, talent shortage for advanced manufacturing.	[29]
- E&E (Sub-sector)	Visual inspections, smart factory ops, predictive maintenance.	RM107bn GDP (2023), 13% global semiconductor back-end. Projected >8% GDP by 2030.	MNC-led adoption.	High investment cost for SMEs, talent to move up value chain.	[32]
- Palm Oil (Sub-sector)	AI-driven mills: predictive analytics, automation,	Potential 35% reduction in foreign labor dependency	World’s first AI-driven palm oil mill.	Scalability of adoption.	[4]

	real-time monitoring.	(nationwide).			
Healthcare	AI-assisted diagnostics (lung cancer, diabetic retinopathy, X-ray/CT analysis, mammography), operational efficiency (chatbots, CCMS), clinical decision support.	Healthcare market >$48bn by 2028. AI healthcare market: USD 220m by 2030 (CAGR 45.42%). Medical devices: USD 4.75bn by 2029 (CAGR 7.51%).	LCNM/AstraZeneca lung cancer diagnosis, DR. MATA, improved radiology trainee detection.	Early stage of adoption, scalability of solutions, rural access, integration into routine workflows, data privacy.	[4]
Financial Services	Fraud detection (NFP), AML, e-KYC, customer service (chatbots, personalization), credit underwriting, automated wealth management.	AI in Fintech Market: USD 3.11bn by 2030 (CAGR 7.30%). Cloud deployment: 60% market share.	National Fraud Portal (NFP) reducing fund tracing time by 75%. High consumer preference for AI interaction.	Regulatory gaps (ADM in PDPA), data security, ensuring consumer protection with increased automation.	[4]
Agriculture	AI-powered order matching (Rakan Tani), precision farming, AI weather forecasting.	Improved farmer income & financial stability, enhanced food security.	Rakan Tani platform, Toshiba Weather Forecast AI in Smart Farming.	Digital literacy among farmers, infrastructure in rural areas.	[4]
Public Services & Smart Cities	Smart City Framework implementation, AI for traffic analysis, traffic	Improved urban planning, traffic flow, public safety,	KL CCTV AI traffic analysis, JPJ AI plans, Putrajaya autonomous	Data privacy, ensuring equitable access to smart services,	[3]

	offense detection, autonomous public transport, integrated GovTech services.	service delivery efficiency. KL ranked 73rd smartest city.	buses.	complexity of integration.	

This table provides a comparative snapshot of AI's penetration and impact across key Malaysian industries. It highlights that while significant economic contributions are anticipated across the board, the maturity of AI applications and the nature of challenges vary by sector. Manufacturing and Finance appear to be leading in terms of adoption and projected economic value, while Healthcare shows strong potential in specific diagnostic areas. Cross-cutting concerns like SME adoption and ensuring equitable benefits remain paramount.

5. Advancing Office Automation through Artificial Intelligence

The integration of Artificial Intelligence into office environments and business processes is a critical component of Malaysia's digital transformation agenda. AI is increasingly being leveraged to enhance productivity, streamline workflows, and empower employees in both the public and private sectors, although adoption rates and specific applications vary.

5.1 Current AI Adoption for Office Productivity and Business Process Management (BPM)

Globally and in Malaysia, AI is fundamentally changing how office work is performed. It is increasingly utilized to automate repetitive and time-consuming tasks, thereby reducing bottlenecks in business processes and improving overall accuracy.[44] A key application in this domain is **Intelligent Document Processing (IDP)**, which automates the extraction and processing of data from complex documents such as invoices and contracts. This minimizes manual data entry, accelerates document-heavy workflows, and reduces the likelihood of human error.[44]

AI-driven Business Process Management (BPM) allows for more dynamic and adaptive workflows. These systems can facilitate real-time adjustments and support continuous process improvement without constant human intervention.[44] This marks a significant evolution from basic Robotic Process Automation (RPA), which typically handles rule-based tasks in isolation. The shift towards AI-infused BPM represents a move towards intelligent orchestration of entire business processes, integrating AI to enhance decision-making and optimize workflows from end to end.[45] While many organizations have adopted RPA tools for

discrete tasks, these efforts are often siloed. AI-infused BPM offers a more holistic and sophisticated approach to automation.[45]

5.2 Impact on Public Sector Operations

The Malaysian public sector is a key focus area for AI-driven office automation, with significant initiatives underway to streamline government operations and enhance citizen engagement.[7]

- The **"AI at Work 2.0"** program, a collaborative effort between the Ministry of Digital and Google Cloud, has equipped 270 public officers with Google Workspace's Generative AI (GenAI) tools. The program yielded positive feedback, with over 90% of participants reporting that the GenAI tools enhanced their work quality and operational efficiency.[7] This successful pilot indicates a strong potential for GenAI to transform public administration tasks.
- Building on this, the National AI Office (NAIO) has developed **Public Sector AI Adaption Guidelines**. These guidelines are supporting the scaling of AI use within government agencies, most notably through the planned rollout of Google Workspace's Gemini Suite to an extensive 445,000 public officers.[4] Such a large-scale deployment signifies a major commitment to leveraging AI for widespread office automation and productivity gains across the civil service.
- Broader **GovTech initiatives** aim to create integrated government services through sophisticated digital platforms, which inherently rely on AI for backend processing, data analysis, and efficient service delivery to citizens.[3]
- The Malaysian Administrative Modernisation and Management Planning Unit (MAMPU) is also exploring specific AI applications, such as AI-based facial recognition technology for monitoring employee attendance.[14]

This proactive stance by the public sector not only aims to improve its own efficiency but also serves as a large-scale testbed and potential model for AI adoption in office environments nationwide.

5.3 AI-driven Automation in Small and Medium Enterprises (SMEs) and Large Corporations

The application of AI for office automation in the private sector presents a more varied picture, with differing adoption rates and challenges between SMEs and larger corporations.

- **Small and Medium Enterprises (SMEs):** AI holds substantial potential for SMEs to exponentially increase their scale of operations, boost productivity, and minimize operational costs.[46] Practical AI applications that can directly benefit SME office environments include:
    - **Automating Customer Support:** AI-powered chatbots and virtual assistants can handle routine inquiries, provide real-time support, and operate 24/7, potentially reducing customer support costs by up to 30%.[47]

    - **Leveraging Analytics:** AI tools can help SMEs gain deeper insights into customer behavior and market trends from their data.[47]
    - **Enhancing Marketing:** AI can personalize marketing campaigns and target specific customer segments more effectively.[47]
    - **Optimizing Operations:** AI can assist in demand forecasting and inventory management, streamlining supply chain operations.[47] Despite these clear benefits, AI adoption rates for office automation and other functions among Malaysian SMEs remain relatively low. One study from a few years ago indicated that only 32% of Malaysian companies were beginning to explore machine learning, with AI integration being primarily considered by large enterprises.[46] Another report suggested that a mere 26% of Malaysian enterprises had embarked on their AI journeys.[46] More recently, a 2023 Cisco AI Readiness Index (covering all organization sizes, not just SMEs) found that 87% of Malaysian organizations were not fully ready to integrate AI into their businesses, a figure similar to the global average.[48] This suggests that the same barriers hindering broader AI adoption—such as cost, lack of expertise, and data concerns—are likely impacting the uptake of AI for office automation within SMEs.
- **Large Corporations:** In contrast, large corporations in Malaysia, particularly MNCs in sectors like E&E, are generally more advanced in adopting AI for productivity improvements and smart manufacturing processes.[4] There is a strong intent among business leaders to leverage AI; for instance, 86% of leaders in Malaysia plan to expand their workforce capacity with intelligent AI-driven agents within the next 18 months.[8] This indicates a forward-looking approach to integrating AI into core business processes, including office functions.

5.4 Projected Benefits for Workforce Empowerment and Operational Streamlining

The integration of AI into office automation is projected to yield significant benefits beyond mere efficiency gains, extending to workforce empowerment and strategic realignment of human capital.

- AI-driven BPM solutions can free employees from mundane, repetitive tasks, allowing them to dedicate more time and energy to higher-level, strategic work that requires creativity, critical thinking, and complex problem-solving skills.[44]
- The advent of no-code AI tools integrated with BPM platforms further democratizes automation. These tools can empower business users, even those without coding expertise, to create, modify, and optimize digital processes, thereby reducing dependency on specialized IT departments and shortening development cycles for new solutions.[44]
- AI can automate routine HR tasks, such as initial resume screening and job matching,

allowing HR professionals to focus on more strategic aspects of talent management.[51] Generative AI tools can also simplify complex information and training materials, making them more accessible to employees.[51]

- Microsoft's 2025 Work Trend Index highlights a critical issue: 83% of Malaysia's workforce (both employees and leaders) report lacking sufficient time or energy to complete their work effectively.[50] In this context, AI-driven intelligent agents are increasingly seen not as job replacers, but as digital team members or assistants that can help expand workforce capacity and alleviate burnout.[8] Indeed, 51% of Malaysian leaders report that they are already using such agents to fully automate certain workstreams or business processes.[50]

This narrative shift, framing AI as an augmenter of human capabilities rather than a direct replacement, is crucial for fostering acceptance and maximizing the collaborative potential of human-AI teams in office environments. However, while general benefits of AI in BPM and some global SME efficiency gains are reported (e.g., a TechBehemoths survey in 2024 indicated a 32.71% operational efficiency increase for SMEs globally implementing AI [53]), specific, localized Malaysian case studies quantifying the Return on Investment (ROI) for AI in office automation, especially for SMEs, are not prominently featured in available information.[48] Documenting and disseminating such local success stories could significantly encourage broader adoption by demonstrating tangible benefits in a relatable context.

6. Enabling Factors Catalyzing Malaysia's AI Ecosystem

Malaysia's journey towards becoming an AI-driven nation is supported by a confluence of enabling factors, ranging from proactive government strategies and significant investments in digital infrastructure to a commitment to collaborative partnerships and targeted funding mechanisms. These elements collectively create a conducive environment for AI research, development, and adoption.

6.1 Proactive Government Policies and Strategic Investments

The Malaysian government has demonstrated a strong commitment to fostering AI, evidenced by a suite of national policies and direct financial support.

- **National Roadmaps and Policies:** The **National AI Roadmap (AI-RMAP) 2021-2025** laid the initial strategic groundwork.[1] This is being succeeded by a **new national AI strategy**, co-created in 2025, which aims for a more deeply human-centric and values-driven approach.[6] These are complemented by broader frameworks like the **National 4IR Policy** [3], the **National Science, Technology and Innovation Policy (DSTIN) 2021–2030** [2], and the **10-10 Malaysia Science, Technology, Innovation, and Economy Framework (10-10 MySTIE)** [1], all of which underscore AI's importance and provide a clear strategic direction.[2]

- **Dedicated Institutions:** The establishment of the **Ministry of Digital** and, crucially, the **National AI Office (NAIO)** under its purview, signals a focused effort to spearhead and coordinate national AI initiatives.[2] These bodies are tasked with enhancing AI capabilities, promoting collaboration, and shaping policies.
- **Budgetary Allocations:** The government has backed its strategic intent with financial resources. For instance, Budget 2025 allocated RM10 million for the NAIO and RM50 million for AI education.[27] Funding for AI research at universities was significantly increased from MYR 20 million in 2024 to MYR 50 million in the 2025 Budget.[2]
- **Prime Ministerial Endorsement:** High-level political will is evident, with Malaysia's Prime Minister publicly emphasizing AI's critical role in ensuring the nation's competitiveness, sustainability, and economic success through a "quantum leap".[4]

This top-down, government-led approach provides a strong architectural framework for the AI ecosystem, ensuring that efforts are aligned with national priorities and adequately resourced.

6.2 Development of Robust Digital Infrastructure

Recognizing that AI technologies are data-intensive and require significant computational power, Malaysia is making substantial investments in its digital backbone.

- **Data Centers:** The nation is actively positioning itself as a leading AI and data center hub in Southeast Asia. As of 2024, Malaysia had attracted over RM86 billion in data center investments and hosted 77 operational data centers.[28] The Malaysian data center market is projected for robust growth, from an estimated USD 4.04 billion in 2024 to USD 13.57 billion by 2030, representing a CAGR of 22.38%.[28] This expansion is critical for supporting AI's data processing and storage needs.
- **Cloud Capabilities:** Major global cloud providers are significantly investing in Malaysia. Microsoft announced a landmark USD 2.2 billion investment to fuel the country's cloud and AI ambitions. This includes the establishment of a new **Malaysia West cloud region**, slated to be operational in the second quarter of 2025. This region will feature three distinct availability zones and offer the full suite of Microsoft Cloud services, including Microsoft Azure, Microsoft 365, and Dynamics365/Power Platform.[8] This investment alone is projected to generate USD 10.9 billion in new revenues and facilitate the creation of 37,575 new jobs by 2028.[8] Other major tech companies like Google and ByteDance are also making significant investments in establishing data centers in Malaysia.[49]
- **Connectivity:** Alongside data centers and cloud services, there are ongoing efforts to enhance the nation's overall digital infrastructure to ensure reliable and high-speed connectivity, which is fundamental for supporting advanced AI applications.[27]

These infrastructure developments are a strategic imperative, addressing a core prerequisite for AI development and deployment and potentially giving Malaysia a competitive advantage in attracting AI-focused businesses and talent.

6.3 The Role of Public-Private Partnerships (PPPs) and International Collaborations

Malaysia is actively leveraging partnerships with both domestic and international private sector entities, as well as collaborations with other nations and global bodies, to accelerate its AI development.

- **Public-Private Partnerships (PPPs):** PPPs are a cornerstone of Malaysia's AI strategy, facilitating knowledge transfer, talent development, and access to cutting-edge technologies. Notable examples include:
    - The NAIO's partnership with **Microsoft** for the "AI for Malaysia's Future" (AIForMYFuture) skilling initiative (aiming to train 800,000 Malaysians) and the development of an AI Governance Sandbox framework.[7]
    - The Ministry of Digital's collaboration with **Google Cloud** for the "AI at Work 2.0" program, training public officers on GenAI tools.[7]
    - The NTIS AI Sandbox initiative involving **NVIDIA** to provide technology and expertise.[11]
    - NAIO's broader strategic partnerships with companies like **Toshiba** (for AI in agriculture), **Global AI Village** (for incubating AI applications), **YTL Power** (for developing a Malaysian Large Language Model), and **Amazon Web Services (AWS)** (for AI skills and infrastructure development).[21]
    - MDEC's ongoing collaborations with industry and academia for talent development programs and the provision of AI solutions.[10]
- **International Collaborations:**
    - A significant academic and strategic partnership is MDEC's collaboration with **Zhejiang University (China)**. This initiative aims to leverage the successful 'Zhejiang Model' of digital governance to spur AI innovation, develop talent, and advance smart city projects in Malaysia. It is also intended to foster closer ties between government, academia, and industry in both nations.[9]
    - Malaysia actively engages with international organizations such as the **United Nations (UN), the Organisation for Economic Co-operation and Development (OECD), and the Global Partnership on AI (GPAI)**. These engagements are aimed at shaping global AI governance and ethics discussions, as well as boosting Malaysia's capabilities in AI R&D and policy development.[7]
    - Collaboration with the **World Economic Forum (WEF)** occurs through the Malaysia Centre for Fourth Industrial Revolution (MYCentre4IR), facilitating access to global expertise and partnerships.[21]

These partnerships are not merely symbolic; they are integral to Malaysia's strategy for accelerating its learning curve, accessing global best practices, building a skilled workforce, and integrating its AI ecosystem with the wider international community.

6.4 The Quadruple Helix Model in Action

The AI-RMAP explicitly promotes a **quadruple helix approach**—involving government, industry, academia, and society—to foster cross-sectoral collaboration. This model is envisioned as essential for deploying AI solutions effectively and securing national competitiveness in the AI domain.[1] This collaborative philosophy is evident in various initiatives:

- MOSTI's development of the national AI Code of Ethics involves contributions from Universiti Teknologi Malaysia (UTM), various government agencies, other higher education institutions, and industry players.[5]
- The co-creation process for the new national AI strategy (post-2025) is also built on this multi-stakeholder model, bringing together experts from all four pillars of the helix.[6]

While the government and industry often appear as the dominant actors in many initiatives, the sustained and meaningful engagement of academia (beyond targeted research funding) and civil society (beyond initial consultations) is crucial for the long-term health, ethical grounding, and inclusivity of Malaysia's AI ecosystem. The success of the aspired "uniquely Malaysian approach" [6] hinges on the genuine and continuous involvement of all segments of this helix.

6.5 Availability of Funding, Grants, and Incentives for AI R&D and Adoption

Financial support mechanisms are in place to encourage AI research, development, and adoption, particularly targeting SMEs and innovative startups.

- **Government Grants and Incentives for SMEs:** Various schemes aim to ease the financial burden of digitalization and AI adoption for SMEs.
    - The **Business Digitalisation Initiative (BDI)**, backed by a RM1.5 billion blended funding pool, offers freemium digital solutions, digitalization toolkits, and access to an ecosystem of partners.[57]
    - The **MyDataHub.Ai platform**, a joint initiative by MDEC and Dattel Asia Group, aims to help SMEs access RM150 million in financing by connecting them with businesses and partners.[10]
    - MDEC offers grants such as the **Malaysia Digital X-Port Grant (MDXG)** for global market expansion and the **Malaysia Digital Catalyst Grant (MDCG)** for developing innovative solutions aligned with the 4IR policy.[58]
    - **Cradle Fund Sdn. Bhd.** provides funding for tech startups through its CIP SPARK and CIP SPRINT programs.[58]
    - The **National Technology Innovation Sandbox (NTIS)** also provides grants to innovators to test and commercialize their solutions.[18]
    - Budget 2025 includes **tax incentives** for AI-related training and R&D, as well as

simplified hiring processes for foreign AI graduates from Malaysian universities.[31]

- **Investment Funds:** Agencies like **Malaysia Debt Ventures Bhd (MDV)** offer financing specifically for technology-driven startups, including those in the AI sector.[27]
- **Support for AI Solution Providers:** MDEC has actively onboarded 140 AI solution providers into the Malaysia Digital AI ecosystem, fostering a local supply of AI expertise and tools.[4]

These funding mechanisms and support structures are vital for lowering the barriers to entry for AI adoption and for stimulating a vibrant local AI industry.

7. Navigating the Headwinds: Challenges in Malaysia's AI Implementation

Despite the strategic initiatives and enabling factors, Malaysia's path to realizing its AI ambitions is fraught with significant challenges. These range from human capital deficits and data governance complexities to ethical dilemmas and socio-economic disparities, all of which require careful navigation and concerted effort to overcome.

7.1 The Critical AI Talent Gap: A Major Impediment to Growth

One of the most pressing challenges is the **critical shortage of skilled AI talent**. This deficit poses a substantial threat to Malaysia's ability to innovate, adopt AI effectively, and compete globally.

- **Quantifying the Shortage:** Reports indicate a severe mismatch between demand and supply. In 2024, a staggering 81% of Malaysian employers reported struggling to hire AI talent, even though 90% prioritized these skills.[4] The demand for AI specialists, data scientists, and engineers far outstrips the current pool.[38] The World Bank has estimated that Malaysia currently has around 3,000 AI professionals, while the demand is projected to reach 30,000 by 2030.[4]
- **Challenges in Talent Creation (Higher Education):** Several factors contribute to the difficulty in producing AI talent through the higher education system:
    - The **time required to train new graduates** in a rapidly evolving field is considerable.[60]
    - Universities face **high infrastructure costs** associated with providing state-of-the-art AI education and research facilities.[60]
    - There is a **shortage of qualified lecturers and researchers**, as many AI experts are drawn to higher-paying roles in the industry.[60]
    - Keeping university **curricula constantly updated** to reflect rapid advancements in AI is a persistent challenge.[60]
    - Historically, AI-specific courses have often been embedded within broader Computer Science programs, making it difficult to assess graduates' specialized AI skills based on transcripts alone.[60]

    - Broader issues of **graduate skill mismatch and job readiness** persist, with an estimated 12% of existing jobs in Malaysia at risk of automation, necessitating widespread reskilling.[62]

The implications of this talent gap are far-reaching. It not only hinders the pace of AI adoption and innovation but can also erode public trust if AI systems are poorly designed or implemented due to a lack of expertise. Furthermore, it can lead to compliance issues and limit the nation's ability to move up the global AI value chain.[7] This systemic challenge impacts all facets of Malaysia's AI ambition, from developing cutting-edge solutions to ensuring their ethical deployment and robust cybersecurity.

7.2 Data Governance, Privacy, and Cybersecurity: Navigating Risks and Regulatory Ambiguity

Effective AI deployment is heavily reliant on access to high-quality data and robust governance frameworks. Malaysia faces several challenges in this domain.

- **Data Governance Challenges:** Despite the existence of a National Data Sharing Policy, current national governance structures have been described as inconducive to effective information sharing between the public and private sectors.[63] This perceived vacuum in both government and corporate data governance can lead to risks of unethical or unsafe AI development and use.[63] The newly enacted **Data Sharing Act 2025** aims to establish a structured regulatory framework for data sharing among public sector agencies, which may address some of these concerns within the government sphere.[64]
- **Data Quality and Liquidity:** The quality and accessibility of data are paramount for training effective AI models. Poor data quality has been identified as a key barrier to AI deployment by 50% of respondents in one Malaysian study.[66] Ensuring data integrity and "data liquidity"—the seamless ability to access, combine, and analyze data from various sources—is critical.[66]
- **Privacy Concerns:** The adoption of AI technologies inherently raises significant data privacy concerns.[66] A critical regulatory gap exists as Malaysia's **Personal Data Protection Act 2010 (MY PDPA) does not yet specifically regulate Automated Decision-Making (ADM)**.[4] ADM is a core function of many AI systems used in critical areas such as credit scoring, insurance underwriting, and employment screening. This lack of explicit regulation creates uncertainty and may leave individuals without clear understanding or recourse when AI systems make decisions that significantly affect them.[4] The inherent complexity of many AI models, often referred to as the "black box" problem, makes it difficult to interpret how decisions are derived, further complicating data protection and consumer rights.[4]
- **Cybersecurity Threats:** The increasing adoption of AI introduces new and complex cybersecurity threats.[7] The potential for malicious use of AI for sophisticated

cyberattacks is a recognized risk that needs to be proactively managed.[63]

- **Global Regulatory Fragmentation:** Differing AI regulations across countries can also hinder AI adoption for businesses operating internationally and create complex compliance challenges.[7]

These data governance and regulatory gaps create a climate of uncertainty that can slow AI adoption, particularly among businesses wary of potential legal and reputational risks. It also means that as AI systems are deployed, there may be insufficient safeguards against misuse or unintended harmful consequences.

7.3 Ethical Dimensions of AI: Building Trust and Ensuring Fairness

Alongside technical and regulatory challenges, Malaysia must navigate the complex ethical dimensions of AI to ensure its development and use are aligned with societal values and build public trust.

- **Bias and Fairness:** AI systems can inherit and amplify human prejudices present in the data they are trained on, leading to biased or discriminatory outcomes.[4] This is a particular concern for applications like the AI-powered sentencing tools that have been trialed in Sabah and Sarawak, where algorithmic bias could disproportionately affect minorities or marginalized groups.[14]
- **Transparency and Accountability:** The "black box" nature of many advanced AI models poses a significant challenge to transparency, making it difficult to understand or explain their decision-making processes.[4] Establishing clear lines of accountability for the outcomes of AI systems is crucial but complex.[4]
- **Misinformation and Manipulation:** The rise of sophisticated AI, particularly Generative AI, brings the threat of AI-driven misinformation campaigns and the creation of convincing deepfakes. These can pose significant risks to public discourse, social cohesion, and even political stability.[16]
- **Public Awareness and Trust:** There is currently low public awareness regarding the influence and potential risks of AI, as well as a limited understanding of individual rights related to AI, such as privacy rights.[63] Building public trust through education, transparency, and demonstrated responsible use is essential for widespread AI acceptance and adoption.[7]
- **Environmental Impact:** The significant energy consumption associated with training and running large-scale AI models is an emerging ethical concern.[7] A survey indicated that 81% of Malaysian businesses believe that the substantial energy consumption of digital technologies like AI may outweigh their benefits, and 61% fear it could hinder widespread AI adoption.[68]

While Malaysia has established ethical principles [3] and is developing codes of ethics [5], operationalizing these principles and building broad public trust requires more than just guidelines. It necessitates robust enforcement mechanisms, continuous and inclusive public engagement, transparent reporting on AI deployments and their societal impacts, and

proactive measures to mitigate identified ethical risks.

7.4 Barriers to AI Adoption in SMEs: Cost, Expertise, and Infrastructure

Small and Medium Enterprises (SMEs) are vital to Malaysia's economy, but they face substantial and often interconnected barriers to AI adoption, which could lead to a significant portion of the economy being left behind in the AI revolution.

- **High Costs:** The perceived and actual high costs associated with AI implementation—including investments in infrastructure, software, and skilled personnel—are a primary obstacle for resource-constrained SMEs.[32] Many SMEs struggle to justify the upfront investment without clear and immediate Return on Investment (ROI).[48]
- **Lack of Expertise and Knowledge:** A significant knowledge gap exists, with reports indicating that over 60% of SMEs lack awareness of AI's potential benefits.[69] There is also a lack of in-house technical expertise to effectively integrate, manage, and leverage AI technologies.[69] This lack of expertise can make it difficult for SMEs to even assess potential AI solutions or calculate their ROI, thus reinforcing the cost barrier.
- **Infrastructure Limitations:** Some SMEs suffer from underdeveloped digital infrastructure, lacking the foundational systems required to seamlessly integrate AI into their existing operations.[69]
- **Data Privacy and Security Concerns:** SMEs often lack robust data protection frameworks and the resources to manage the data privacy and security risks associated with AI, making them hesitant to adopt data-intensive AI solutions.[69]
- **Low Adoption Rates:** Consequently, AI adoption rates among Malaysian SMEs appear to be low. Studies from a few years prior suggested that only around 26% to 32% of Malaysian enterprises (not exclusively SMEs) had embarked on their AI journeys.[46]

Addressing these multifaceted barriers requires holistic solutions that go beyond simple grant provisions, encompassing targeted technical assistance, awareness programs, and support for data readiness.

7.5 The Digital Divide: Ensuring Equitable AI Access and Benefits

The existing digital divide in Malaysia, particularly between urban and rural areas, poses a risk of exacerbating socio-economic inequalities if the benefits of AI are not proactively extended to all communities.

- **Urban-Rural Gap:** There is a significant disparity in access to core services, education, economic opportunities, digital infrastructure (reliable internet and electricity), and levels of digital literacy between urban and rural parts of Malaysia.[72] Rural communities are often excluded from the transformative potential of emerging technologies like AI.[43]
- **Impact on AI Adoption:** These infrastructure gaps, especially concerning high-speed internet and cloud computing facilities in rural areas, directly hinder the nationwide implementation and adoption of AI, which often relies on robust connectivity and data

processing capabilities.[38]

- **Addressing the Divide:** Recognizing this challenge, some Malaysian initiatives aim to bring AI benefits to sectors with a significant rural presence. For example, the **Rakan Tani** platform is designed to empower farmers, many of whom are in rural areas, through AI.[22] The **NAIO Lab** initiative also explicitly aims to ensure that "no one is left behind" by AI advancements.[22] There is exploration into AI solutions for precision farming, telemedicine and offline AI health assistants for rural healthcare, and AI-powered educational tools tailored for remote learning environments.[43]

A concerted and continuous effort is needed to ensure that AI solutions are accessible, affordable, relevant, and beneficial for rural and underserved communities. This includes investing in infrastructure, promoting digital literacy, and developing AI applications that address their specific needs and contexts, thereby preventing AI from widening existing socio-economic gaps.

7.6 Maturing the Regulatory Landscape and Bolstering National Cybersecurity

The regulatory environment for AI in Malaysia is still evolving, and strengthening national cybersecurity capabilities is crucial in the face of AI-related threats.

- **Nascent AI Legal Framework:** Currently, Malaysia does not have specific legislation regulating AI or machine learning.[4] The country relies on non-legally binding guidelines, such as MOSTI's National Guidelines on AI Governance and Ethics.[4] The need for a dedicated **AI Act** is being actively considered by MOSTI.[5]
- **Gaps in Existing Laws:** As previously mentioned, the Personal Data Protection Act 2010 (MY PDPA) does not yet cover ADM.[4] Similarly, there is a lack of clear oversight specifically for AI in Healthcare (AIH), leaving such technologies subject to a patchwork of existing laws which may not be adequate.[35]
- **Cybersecurity:** Identifying and addressing priority risks against external AI threats is a key focus area for Malaysia's new national AI strategy.[6] This reflects an understanding of the evolving threat landscape that AI presents.

7.7 Addressing Potential Workforce Displacement and Socio-Economic Impact

The transformative power of AI also brings concerns about its impact on the workforce and broader socio-economic structures.

- **Job Displacement Concerns:** Automation driven by AI is expected to affect a portion of the workforce.[38] Some estimates suggest that AI automation could impact as much as 30% of Malaysian jobs by the year 2030.[31] Data indicates that nearly 300,000 workers have been displaced in Malaysia since 2020 due to automation, with the manufacturing sector being the hardest hit, followed by wholesale/retail trade and

professional/scientific services.[73]

- **Need for Reskilling and Upskilling:** In response to these concerns, there is a strong emphasis on reskilling and upskilling the workforce to prepare them for new roles created by AI and to equip them with the skills to work alongside AI technologies. This is a key component of the National AI Roadmap [38] and various talent development initiatives.

Successfully navigating these challenges is paramount for Malaysia to fully harness AI's potential in a responsible, inclusive, and sustainable manner.

8. Cultivating a World-Class AI Talent Pipeline

Addressing the critical AI talent shortage is a cornerstone of Malaysia's national AI strategy. A multi-faceted approach is being adopted, encompassing national-level talent roadmaps, transformations in higher education, strengthening of vocational training, and significant industry-led skilling initiatives. The goal is to cultivate a robust pipeline of AI-proficient individuals capable of driving innovation and meeting the demands of an AI-driven economy.

8.1 National AI Talent Development Strategies and Roadmaps

Malaysia has articulated its commitment to AI talent development through several key strategic documents:

- The **National AI Roadmap (AI-RMAP) 2021-2025** explicitly emphasized the importance of nurturing local AI talent as one of its core pillars.[38]
- The **new national AI strategy**, currently under development for the post-2025 period, identifies "AI talent" as one of its seven priority areas. It aims to propose a robust AI talent pipeline designed to grow local expertise comprehensively.[6]
- The **National AI Talent Roadmap 2024-2030** [49] is specifically focused on building a skilled workforce to enhance Malaysia's global competitiveness in the AI domain.[27]
- Ambitious targets are also set through specific programs, such as the **AI Sandbox Programme** (a collaboration between NTIS and NVIDIA), which aims to nurture over 13,000 new AI talents by the year 2026.[11]

These national-level strategies provide the overarching framework and direction for concerted efforts in AI talent cultivation.

8.2 Transformation in Higher Education: New Programs and Curriculum Modernization

Higher Education Institutions (HEIs) are pivotal in producing the next generation of AI professionals. Malaysia is taking steps to enhance their capacity in this area:

- **Increased Funding for University AI Research:** The 2025 Malaysian Budget significantly expanded funding for AI initiatives at research universities, allocating MYR 50 million, a substantial increase from MYR 20 million in 2024. Each designated

research university has been tasked with a unique AI research focus aligned with national priorities. Examples include Universiti Malaya focusing on AI in medicine, Universiti Putra Malaysia on quantum computing AI for cybersecurity, Universiti Sains Malaysia on AI research for the semiconductor industry, and Universiti Kebangsaan Malaysia on AI-driven translation for the Malay language.[2]

- **New AI Faculties and Degree Programs:**
    - A landmark development was the launch of the **Faculty of Artificial Intelligence at Universiti Teknologi Malaysia (UTM)** in May 2024. This is the first university faculty in Malaysia solely dedicated to AI, offering a comprehensive suite of undergraduate, Master's, and PhD programs with a strong emphasis on cutting-edge research, practical learning, and industry collaborations.[2]
    - There is a broader trend among Malaysian universities to create more distinct AI degree programs, moving away from AI specializations embedded within general Computer Science degrees. This involves renaming programs (e.g., "Bachelor in AI" instead of "B.Comp.Sci (AI)") and ensuring that the curriculum has a deeper and more extensive focus on AI-specific topics from earlier stages of study.[74]
    - Several private universities are also actively offering specialized AI and Data Science programs. For instance, Asia Pacific University of Technology & Innovation (APU) provides an MSc in AI (available both online and on-campus) and a BSc (Hons) in Computer Science with a specialism in Data Analytics.[75] Universiti Teknikal Malaysia Melaka (UTeM) offers a Bachelor of Computer Science (Artificial Intelligence) [75], and Curtin University's Malaysia campus has a Master of Artificial Intelligence program.[75] Other private institutions like Heriot-Watt University Malaysia, Monash University Malaysia, Taylor's University, University of Wollongong (UOW) Malaysia, Multimedia University (MMU), UCSI University, and HELP University are also contributing to the talent pool with various Bachelor's and Master's degrees in Data Science, Data Analytics, and related fields.[76]
- **Curriculum Updates and Relevance:** Universities are being urged to continuously update their curricula to keep pace with the latest industry trends and to collaborate more closely with employers to ensure that educational programs meet job market requirements.[61] The growing global influence of AI and data science is reportedly driving increased enthusiasm and clearer goals among university tutors and lecturers.[2] The Academy of Sciences Malaysia (ASM) has also prepared a white paper with recommendations for the Ministry of Higher Education (MoHE) on managing technological disruptions in teaching and learning, which includes AI.[3]
- **Tax Breaks for Private Universities:** To further stimulate the development of relevant programs, the government offers tax breaks to private universities that develop new academic programs in emerging digital technology fields, including AI, robotics, the Internet of Things (IoT), data science, and financial technology (Fintech).[2]

While these are positive developments, the pace of curriculum change and the development of faculty expertise remain critical concerns. The challenge of keeping curricula aligned with the extremely rapid advancements in AI [60] and addressing the shortage of qualified AI lecturers, many of whom are drawn to more lucrative industry positions [60], are significant hurdles that need ongoing strategic attention.

8.3 Strengthening Technical and Vocational Education and Training (TVET) for AI-Related Skills

Technical and Vocational Education and Training (TVET) institutions also play a crucial role in equipping the workforce with practical, AI-related skills.

- AI tools are increasingly recognized as beneficial for enhancing TVET and STEM (Science, Technology, Engineering, and Mathematics) education. Their integration aims to help bridge the gap between traditional educational methods and the demands of an increasingly digitalized workforce, thereby improving the employability of TVET and STEM graduates.[78]
- There is a growing focus on **AI literacy within the TVET sector**. This includes developing professional development frameworks for TVET educators to effectively incorporate AI into their teaching and equipping learners with essential 21st-century skills relevant to an AI-driven world.[79]
- Specific TVET institutions are beginning to offer AI-related programs. For example, **KNOWSKILLS TVET College** lists Applied Artificial Intelligence among its program offerings in the School for Business and Information Technology.[80]
- **CyberSecurity Malaysia's Cyber Security Academy** also provides TVET courses, which are relevant given the intersection of AI and cybersecurity.[57]
- The **National Dual Training System (SLDN)**, which offers Sijil Kemahiran Malaysia (SKM) Level 3 certification, is also a relevant pathway for acquiring certain AI-related practical skills.[62]
- International initiatives, such as the UK-based JISC's launch of an AI Literacy Curriculum for teaching and learning staff (available from June 2025), could serve as valuable models for structuring similar programs in Malaysia's TVET sector.[81]

8.4 Impact of Industry-Led and PPP Skilling Initiatives

Large-scale skilling initiatives, often driven by Public-Private Partnerships (PPPs), are crucial for achieving broad AI literacy and providing upskilling opportunities across various segments of the population.

- **AIForMYFuture:** This is a flagship national skilling initiative launched as a partnership between **Microsoft and the National AI Office (NAIO)**. It has an ambitious goal to equip **800,000 Malaysians by the end of 2025** with skills needed for the AI era. The program targets diverse segments of society, from students and early-career professionals to civil servants and business leaders, ensuring that AI fluency becomes a

broad-based national capability rather than being limited to tech specialists.[4] AIForMYFuture is delivered through a combination of online learning modules, hands-on workshops, and certification opportunities, covering a wide spectrum of skills from basic AI literacy to more advanced applications such as prompt engineering and AI-driven business process optimization.[8]

- **AI untuk Rakyat (AI for People):** This program, a collaboration involving **Intel, the Malaysian Communications and Multimedia Commission (MCMC), and the Microsoft AI TEACH Programme**, focuses on enhancing AI skills and awareness among the general public. It particularly targets underserved groups and, significantly, makes AI literacy courses ("AI Aware" and "AI Appreciate") free and compulsory for all government servants.[2]
- **MDEC Initiatives:** The Malaysian Digital Economy Corporation (MDEC) has been active in talent development, publishing a Digital Talent Report [83] and running programs like the Data Driven Enterprise Programme.[57] MDEC, in conjunction with PIKOM (the National Tech Association of Malaysia), has also collaborated with the Human Resource Development Corporation (HRD Corp) to develop the Industry Skills Framework (IndSF) for Digital Technology, which aims to establish common references for skills and competencies in the digital industry.[83]
- **HRD Corp (Human Resource Development Corporation):** Beyond its involvement in the IndSF, HRD Corp serves as a key training provider for various skill-based programs preparing individuals for industry needs.[80]
- **Other Industry Efforts:** Platforms like JobStreet's Career Hub have reportedly issued over 3,300 certifications and logged 145,000 minutes of consumed learning content, providing accessible upskilling opportunities.[82] There is also a strong call for more active industry involvement in talent development, such as providing guest lectures at universities, offering training for students working on final-year projects, and creating structured internship programs.[60]

These large-scale initiatives are vital for raising general AI awareness and foundational skills. However, the depth of expertise imparted through such broad programs versus specialized university degrees needs careful consideration to ensure Malaysia develops both widespread AI literacy and a sufficient cadre of deeply skilled AI professionals.

8.5 Strategies to Address Shortage of AI Educators and Ensure Curriculum Relevance

A critical bottleneck in expanding AI talent development is the shortage of qualified AI educators and the challenge of keeping curricula up-to-date.

- The **shortage of qualified lecturers** in HEIs is a recognized problem, as AI experts often prefer higher-paying positions in the industry.[60] This directly impacts the quality and capacity of AI education.

- Addressing this requires proactive strategies, such as developing **national AI faculty development programs** aimed at attracting, training, and retaining qualified AI educators. This could involve offering competitive incentives, fostering closer ties between academia and industry (e.g., industry professionals co-teaching courses), and supporting continuous professional development (CPD) in AI for existing educators.[79]
- Ensuring **curriculum relevance** necessitates ongoing collaboration between educational institutions and industry players. This includes incorporating industry feedback into curriculum design, providing opportunities for students to work on real-world AI projects, and ensuring that programs reflect the latest technological advancements and market demands.[60]

8.6 Evaluation of Talent Development Programs (Effectiveness, Job Placement - Gaps in Data)

While Malaysia has launched numerous AI talent development programs with ambitious enrollment targets (e.g., AIForMYFuture aiming for 800,000 individuals skilled by the end of 2025 [8], and the AI Sandbox initiative targeting 13,000 AI talents by 2026 [11]), there is a significant gap in publicly available, comprehensive data regarding their effectiveness, particularly concerning completion rates, actual skill acquisition levels, and, crucially, job placement rates or career progression for graduates of these specific AI programs.

- General labor market statistics provide some context: youth unemployment stood at 9.8% as of February 2025, and graduate unemployment was 4.7%, with persistent issues of skill mismatch.[62] A 2022 report indicated that 34.4% of graduates were employed in low-skilled or semi-skilled jobs, suggesting underemployment.[62]
- MDEC's Digital Talent Report from 2017 had projected a digital workforce of 0.54 million by 2020 [83], and the more recent Digital Economy Blueprint (as of 2024) targets the creation of 500,000 new jobs by 2025.[62] These macro targets provide a backdrop but do not isolate the impact of AI-specific training.
- Some program-specific feedback exists: for instance, the "AI at Work 2.0" program for public officers reported that over 90% of its 270 participants found the GenAI tools enhanced their work quality and efficiency.[7] This indicates immediate applicability but does not measure long-term career impact or broader job market absorption.
- TalentCorp Malaysia is conducting an Impact Study of AI, Digital, and Green Economy on the Malaysian Workforce, which aims to offer key guidance to policymakers and industries and highlight essential reskilling and upskilling programs.[36] Such studies are vital.

The current lack of detailed, publicly accessible outcome data for many AI-specific talent initiatives makes it challenging to rigorously assess their true ROI, identify areas for improvement, and strategically allocate resources for maximum impact. A more systematic approach to monitoring and evaluation, focusing not just on enrollment numbers but on validated skill acquisition and tangible employment outcomes, is essential.

The multi-pronged strategy for talent development is commendable, addressing various educational levels and workforce segments. However, ensuring effective coordination among the numerous initiatives, maintaining the pace of curriculum adaptation in HEIs, developing a sustainable pool of AI educators, and rigorously evaluating program outcomes are key areas that will determine the ultimate success of Malaysia's efforts to build a world-class AI talent pipeline.

Table 4: Key AI Talent Development Programs and Initiatives in Malaysia

Program Name/Category	Implementing Organization(s)/Leads	Target Audience	Stated Goals/Enrollment Targets	Key Features/Focus Areas	Reported Outcomes/Effectiveness (if available)	Key Snippet ID(s)
National Strategies & Roadmaps	Government (MOSTI, Ministry of Digital, NAIO)	Entire AI ecosystem	Develop robust AI talent pipeline, enhance global competitiveness.	Policy formulation, strategic direction.	National AI Talent Roadmap 2024-2030/2033 in place.	[6]
Higher Education Transformation	Malaysian Universities (Public & Private), MoHE	Undergraduate and postgraduate students, researchers.	Increase AI research funding (MYR 50m in 2025 Budget), develop specialized AI degree programs.	New AI faculties (e.g., UTM), dedicated AI/Data Science degrees, curriculum modernization, tax breaks for private universities.	UTM launched dedicated AI faculty; various new degrees at APU, UTeM, Curtin, etc.	[2]
TVET Enhancement for AI Skills	TVET Institutions, HRD Corp, CyberSecurity Malaysia	Vocational students, adult learners.	Improve employability through AI-related practical skills.	AI literacy for educators & learners, Applied AI programs (e.g.,	Focus on 21st-century skills, AI tools in TVET.	[57]

				KNOWSKILLS TVET College).		
AIForMYFuture	Microsoft, National AI Office (NAIO)	Students, early-career professionals, civil servants, business leaders.	Equip 800,000 Malaysians with AI skills by end of 2025.	Online learning, hands-on workshops, certifications (basic AI literacy to advanced applications like prompt engineering, AI-driven BPM).	Ongoing; aims for broad AI fluency.	[8]
AI untuk Rakyat (AI for People)	Ministry of Digital, Intel, MCMC Microsoft AI TEACH Programme	General public (esp. underserved groups), all government servants.	Enhance AI skills and awareness broadly.	Free courses ("AI Aware," "AI Appreciate") in local languages, compulsory for all government servants.	Ongoing; focuses on foundational AI literacy.	[2]
NTIS AI Sandbox Talent Development	MRANTI, NVIDIA	Aspiring AI talents, startups.	Nurture over 13,000 new AI talents by 2026.	Access to specialized labs, NVIDIA's AI capability-building programs.	Part of the broader AI Sandbox initiative.	[11]
MDEC/PIKOM/HRD Corp Initiatives	MDEC, PIKOM, HRD Corp	Digital workforce, employers, training providers.	Develop Industry Skills Framework (IndSF) for Digital Technology,	Digital Talent Reports, Data Driven Enterprise Programme, IndSF development	IndSF for Digital Tech developed.	[57]

			support digital talent growth.	.		
AI at Work 2.0 (Public Sector)	Ministry of Digital, Google Cloud	Public officers.	Equip public officers with GenAI tools for enhanced productivity.	Training on Google Workspace GenAI tools.	270 officers trained; >90% reported enhanced work quality/efficiency.	[7]

This table consolidates the diverse talent development efforts, illustrating the breadth of initiatives from national strategies to specific training programs. It highlights the ambitious targets set and the collaborative nature of many of these programs. However, the "Reported Outcomes/Effectiveness" column also underscores the general lack of detailed, publicly available data on job placement and long-term impact for many of these AI-specific initiatives, a crucial area for future focus.

9. Strategic Recommendations for Propelling Malaysia's AI Vision

To effectively navigate the complexities of AI development and ensure that Malaysia fully realizes its ambitious AI vision, a series of interconnected and actionable strategic recommendations are proposed. These are derived from the preceding analysis of the nation's AI strategies, initiatives, impacts, enabling factors, and challenges. The focus is on enhancing the effectiveness of existing structures and programs, fostering a balanced approach between innovation and governance, and ensuring inclusive and sustainable AI-driven growth.

9.1 Strengthening AI Governance and Regulatory Agility

A robust, clear, and adaptable governance framework is paramount for fostering trust and guiding responsible AI innovation.

- **Expedite and Enforce Ethical and Legal Frameworks:** The finalization and implementation of the national AI Code of Ethics should be prioritized, accompanied by clear enforcement mechanisms and consideration for a comprehensive AI Act. This will provide much-needed legal certainty for developers, businesses, and users.
- **Address Regulatory Gaps for ADM:** The Personal Data Protection Act (PDPA) must be updated to explicitly regulate Automated Decision-Making (ADM), aligning with international best practices. This will enhance data privacy and provide clear rights and recourse for individuals affected by AI-driven decisions in critical sectors like finance and employment.

- **Establish Dynamic Regulatory Monitoring:** Given the rapid evolution of AI, particularly Generative AI, a dynamic regulatory monitoring mechanism should be established. This body should be empowered to quickly assess emerging AI technologies and adapt regulations and guidelines proactively to address new ethical challenges and risks.
- **Enhance Inter-Agency Coordination:** Strengthen coordination and clarify roles among key government bodies involved in AI (e.g., MOSTI, Ministry of Digital, NAIO, MDEC, MRANTI). This will ensure a cohesive national AI governance strategy, prevent fragmentation of efforts, and streamline processes for stakeholders.

9.2 Bridging the AI Talent Chasm

The critical shortage of AI talent requires a concerted and sustained national effort, focusing on both the quantity and quality of AI professionals.

- **National AI Faculty Development Program:** Launch and fund a dedicated program to attract, train, and retain qualified AI educators and researchers in Higher Education Institutions (HEIs) and TVET institutions. This could involve industry partnerships, fellowships, and incentives to build a strong academic foundation for AI talent development.
- **Mandate and Fund Continuous Curriculum Updates:** Ensure that AI curricula in HEIs and TVETs are continuously updated to reflect the latest industry needs, technological advancements, and global AI trends. This should include incorporating practical, hands-on AI projects and ethics training into all relevant programs.
- **Implement Robust M&E for Talent Programs:** Establish comprehensive monitoring and evaluation (M&E) frameworks for all AI talent development initiatives. This framework should track not just enrollment numbers but also completion rates, validated skill acquisition, job placement rates, and long-term career impact of graduates. Making aggregated M&E data publicly available can inform policy decisions and guide individuals in their learning choices.
- **Expand Industry-Led Apprenticeships and Internships:** Foster and expand high-quality apprenticeship and internship programs in collaboration with industry, providing clear pathways to employment for AI graduates and ensuring skills align with real-world demands.

9.3 Accelerating SME AI Adoption

SMEs are crucial to Malaysia's economy, and their effective adoption of AI is key to inclusive digital transformation.

- **Targeted End-to-End SME Support:** Move beyond general grants to offer comprehensive, end-to-end support packages for SMEs. This should include subsidized AI diagnostic tools to assess readiness, expert consultation services to identify high-ROI AI use cases (particularly in office automation and core operational areas), and assistance in preparing their data for AI applications.

- **Promote Affordable and Scalable AI Solutions:** Foster the development and promotion of AI solutions that are affordable, scalable, and user-friendly, specifically tailored to the needs and resource constraints of SMEs. This could involve supporting local AI solution providers focused on the SME market.
- **Facilitate Peer-to-Peer Learning:** Create and support platforms and networks where SMEs can share their experiences, challenges, and success stories related to AI adoption. Peer-to-peer learning can be a powerful catalyst for building confidence and disseminating best practices.

9.4 Fostering an Ethical and Trustworthy AI Ecosystem

Building public trust and ensuring AI is developed and used ethically are non-negotiable for sustainable AI adoption.

- **Sustained Public Awareness and Digital Literacy Campaigns:** Launch and maintain comprehensive public awareness and digital literacy campaigns on AI, its benefits, potential risks, and ethical implications. These campaigns should target all segments of society and be culturally sensitive.
- **Promote "Explainable AI" (XAI) and Bias Mitigation:** Incentivize research, development, and adoption of "Explainable AI" (XAI) techniques and tools for detecting and mitigating algorithmic bias. This will enhance transparency and fairness in AI systems.
- **Establish Clear Redress Mechanisms:** Develop and publicize clear, accessible, and effective redress mechanisms for individuals or groups who believe they have been adversely or unfairly affected by AI-driven decisions.
- **Incentivize "Green AI":** Promote and incentivize the development and adoption of energy-efficient AI algorithms, models, and infrastructure ("Green AI") to mitigate the environmental impact of AI technologies.

9.5 Ensuring Inclusive AI Development and Bridging the Digital Divide

AI's benefits must reach all Malaysians, including those in rural and underserved communities, to prevent the exacerbation of existing inequalities.

- **Targeted Investment in Rural Digital Infrastructure and AI Literacy:** Invest in programs specifically designed to improve digital infrastructure (reliable connectivity, access to devices) and enhance AI literacy in rural and underserved areas.
- **Support for Rural-Focused AI Solutions:** Encourage and support the development of AI solutions that are tailored to the specific needs and contexts of rural industries (e.g., precision agriculture, sustainable local tourism) and public services (e.g., AI-powered telemedicine, adaptive educational tools for remote learning).
- **Ensure Diverse Representation in AI Development:** Actively promote and ensure diverse representation (gender, ethnicity, socio-economic background, geographical location) in AI development teams, policymaking bodies, and ethical review boards to ensure that AI systems reflect the needs and values of all Malaysians.

9.6 Optimizing the AI Innovation Ecosystem

Continuously refining the support structures for AI innovation will ensure Malaysia remains competitive and agile.

- **Streamline Access to AI Sandboxes and Commercialization Pathways:** Ensure that access to AI Sandboxes (NTIS, NAIO-led, etc.) is straightforward and well-publicized. Provide clear and efficient pathways for successful sandbox projects to move towards commercialization and navigate regulatory approval processes.
- **Enhance Early-Stage AI R&D Funding:** Increase and streamline funding opportunities for early-stage AI research and development (R&D) and proof-of-concept projects, particularly in strategic sectors identified in national roadmaps.
- **Strengthen Quadruple Helix Collaboration:** Actively promote and facilitate the "quadruple helix" collaboration model, ensuring sustained, meaningful, and impactful participation from academia and civil society organizations alongside government and industry in shaping and implementing the national AI agenda.

These recommendations, if implemented cohesively, can help Malaysia navigate the challenges and capitalize on the opportunities presented by AI, propelling the nation towards its vision of becoming a leader in responsible and innovative AI.

10. Conclusion: Towards a Resilient, Inclusive, and Innovative AI-Powered Malaysia

Malaysia stands at a pivotal juncture in its journey to harness the transformative power of Artificial Intelligence. The nation has demonstrated a clear and ambitious vision, underpinned by strategic planning, the establishment of dedicated institutions like the National AI Office, and the rollout of key initiatives such as the National AI Roadmap and a diverse AI Sandbox ecosystem. These concerted efforts reflect a deep understanding of AI's potential to drive significant economic growth, revolutionize key industries including manufacturing, healthcare, and finance, and enhance the efficiency and efficacy of both public and private sector operations. Projections of AI contributing USD 115 billion to the economy by 2030 underscore the immense opportunities that lie ahead.[4]

However, the path to becoming an AI-powered nation is not without its obstacles. The critical AI talent deficit remains a primary concern, potentially constraining the pace of innovation and adoption across all sectors.[4] Establishing robust, agile, and comprehensive data and AI governance frameworks, particularly in addressing areas like Automated Decision-Making and evolving cybersecurity threats, is crucial for building a trustworthy AI environment.[4] Ensuring the ethical deployment of AI—mitigating bias, combating misinformation, and addressing environmental concerns—is paramount for maintaining public confidence and societal well-being.[16] Furthermore, fostering widespread AI adoption among SMEs, which form the backbone of the Malaysian economy, and bridging the digital divide to ensure

equitable access to AI's benefits for all citizens, especially in rural and underserved communities, are critical for inclusive national development.[46]

The success of Malaysia's AI endeavor hinges on sustained commitment and adaptive strategies. The espoused quadruple helix model of collaboration—integrating government, industry, academia, and civil society—must be actively nurtured to co-create a "uniquely Malaysian" AI future that is not only technologically advanced but also ethically sound and socially responsible.[1] This requires continuous investment in human capital, from foundational AI literacy programs like "AI untuk Rakyat" [3] to specialized higher education and vocational training. It also demands an unwavering focus on ethical principles to guide innovation, ensuring that AI serves human benefit and happiness.

As Malaysia moves forward, the ability to continuously adapt its strategies, learn from global best practices while tailoring them to local contexts, and rigorously monitor the impact of its initiatives will be key. By addressing the identified challenges with foresight and determination, and by capitalizing on its strengths in digital infrastructure and collaborative partnerships, Malaysia is well-positioned to not only navigate the complexities of the AI era but also to emerge as a resilient, inclusive, and innovative leader in the global AI landscape, ultimately harnessing AI's transformative power for sustainable national development and the prosperity of all its citizens.

Works cited

1. aipalync.org, accessed on May 27, 2025, https://aipalync.org/storage/documents/main/air-map-playbook-overall-19102021-rtg_1713947002.pdf
2. council.science, accessed on May 27, 2025, https://council.science/wp-content/uploads/2025/02/AI-Paper-Case-Study-Malaysia_V2.pdf
3. council.science, accessed on May 27, 2025, https://council.science/wp-content/uploads/2025/02/AI-Paper-Case-Study-Malaysia_V1.pdf
4. Artificial Intelligence 2025 - Malaysia | Global Practice Guides - Chambers and Partners, accessed on May 27, 2025, https://practiceguides.chambers.com/practice-guides/artificial-intelligence-2025/malaysia/trends-and-developments
5. MOSTI developing code of ethics, governance for AI, expected to be ..., accessed on May 27, 2025, https://mranti.my/happenings/news/mosti-developing-code-of-ethics-governance-for-ai-expected-to-be-ready-by-2024-says-minister
6. www.digital.gov.my, accessed on May 27, 2025, https://www.digital.gov.my/api/file/file/19042025_PRESS%20RELEASE__MALAYSIA_MOVES_FORWARD_WITH_AI_STRATEGY_GROUNDED_IN_LOCAL_VALUES_AND_GLOBAL_INSIGHT.pdf
7. Malaysia aims to be a global leader in responsible AI innovation - GovInsider, accessed on May 27, 2025, https://govinsider.asia/intl-en/article/malaysia-aims-to-be-a-global-leader-in-responsible-ai-innovation

8. Building the foundations for Malaysia's AI-enabled economy - Source Asia - Microsoft News, accessed on May 27, 2025, https://news.microsoft.com/source/asia/features/building-the-foundations-for-malaysias-ai-enabled-economy/
9. MDEC and Zhejiang University Forge Strategic Partnership to ..., accessed on May 27, 2025, https://www.malaysiasme.com.my/mdec-and-zhejiang-university-forge-strategic-partnership-to-accelerate-ai-innovation-and-digital-economy-growth/
10. Malaysia Digital Tech Adoption Summit: Artificial Intelligence (AI), accessed on May 27, 2025, https://www.digital.gov.my/en-GB/siaran/MALAYSIA-DIGITAL-TECH-ADOPTION-SUMMIT-:-ARTIFICIAL-INTELLIGENCE-(AI)
11. Launching AI Sandbox, Malaysia targets to create 900 startups by 2026 - HeapTalk, accessed on May 27, 2025, https://heaptalk.com/news/launching-ai-sandbox-malaysia-targets-to-create-900-startups-by-2026/
12. AI Sandbox launch with NVIDIA - MRANTI, accessed on May 27, 2025, https://mranti.my/happenings/media-centre/press-release/ai-sandbox-launch-with-nvidia
13. AI Ethics & Governance 2025 - Pikom, accessed on May 27, 2025, https://www.pikom.org.my/2025/PIKOM_AI_ethic_and_governance_2025.pdf
14. Malaysia's recognition of the need for an ethical approach to artificial intelligence (AI) is embedded within the country's National AI Roadmap (AI-Rmap). The AI-Rmap, drafted from December 2020 to March 2021, outlines the establishment of an AI Code of Ethics as one of four strategic initiatives that would contribute toward a broader AI governance framework. - Background | Asia Society, accessed on May 27, 2025, https://asiasociety.org/policy-institute/raising-standards-data-ai-southeast-asia/ai/malaysia
15. CAIDP-Malaysia-PDPC-Automated Decision Making-May,2025 - LinkedIn, accessed on May 27, 2025, https://media.licdn.com/dms/document/media/v2/D4E1FAQGd81iHYO4Erg/feedshare-document-pdf-analyzed/B4EZbUPmXRHIAc-/0/1747317585104?e=1748476800&v=beta&t=OL-9RZOyuRBEz21aKiPTIwE_r77Hbw1xum4TwGaLd3U
16. Malaysia's AI development to incorporate ethical considerations, risk mitigation, accessed on May 27, 2025, https://www.wicinternet.org/2024-05/27/c_991728.htm
17. Sandboxes for AI: Tools for a new frontier - The Datasphere Initiative, accessed on May 27, 2025, https://www.thedatasphere.org/wp-content/uploads/2025/02/Report-Sandboxes-for-AI-2025.pdf
18. National Technology & Innovation Sandbox, accessed on May 27, 2025, https://sandbox.gov.my/
19. AI Startups in Malaysia: A Growing Hub of Innovation - MYStartup, accessed on May 27, 2025, https://www.mystartup.gov.my/news-events/articles/EzJfrwK5mH4k59u/ai-startups-in-malaysia-a-growing-hub-of-

innovation
20. Sandbox & Partners, accessed on May 27, 2025, https://sandbox.gov.my/sandbox-partners
21. Thought Leadership | Malaysia National AI Office (NAIO) - AI.gov.my, accessed on May 27, 2025, https://www.ai.gov.my/thought-leadership/
22. NAIO sets a new benchmark in Agritech with AI solutions through Rakan Tani, accessed on May 27, 2025, https://www.digital.gov.my/en-GB/siaran/NAIO-sets-a-new-benchmark-in-Agritech-with-AI-solutions-through-Rakan-Tani
23. Malaysian capital markets regulator readies launch of sandbox - Global Government Fintech, accessed on May 27, 2025, https://www.globalgovernmentfintech.com/malaysia-capital-markets-regulator-regulatory-sandbox/
24. Malaysia's SC to forge new paths for FinTech innovation with regulatory sandbox, accessed on May 27, 2025, https://fintech.global/2025/02/17/malaysias-sc-to-forge-new-paths-for-fintech-innovation-with-regulatory-sandbox/
25. Regulatory Sandbox - Digital | Securities Commission Malaysia, accessed on May 27, 2025, https://www.sc.com.my/development/digital/regulatory-sandbox
26. SC introduces regulatory sandbox to facilitate innovation | The Star, accessed on May 27, 2025, https://www.thestar.com.my/business/business-news/2025/02/17/sc-introduces-regulatory-sandbox-to-facilitate-innovation
27. Malaysia lays roadmap for regional AI hub - The Malaysian Reserve, accessed on May 27, 2025, https://themalaysianreserve.com/2025/02/04/malaysia-lays-roadmap-for-regional-ai-hub/
28. Why Malaysia needs datacenters for an AI-powered future - Source Asia - Microsoft News, accessed on May 27, 2025, https://news.microsoft.com/source/asia/features/why-malaysia-needs-datacenters-for-an-ai-powered-future/
29. The Economic Impact of Generative AI - AI.gov.my, accessed on May 27, 2025, https://www.ai.gov.my/media/thought-leadership/Reports-06-EN-Economic-Impact-of-Generative-AI-MY-1.pdf
30. Malaysia AI in Smart Manufacturing Market Size and Forecasts 2030 - Mobility Foresights, accessed on May 27, 2025, https://mobilityforesights.com/product/malaysia-ai-in-smart-manufacturing-market
31. Malaysia's AI Landscape & What It Means For Businesses (2025) - VeecoTech, accessed on May 27, 2025, https://www.veecotech.com.my/blog/malaysia-ai-landscape/
32. Impact Study of Artificial Intelligence, Digital, and Green Economy on the Malaysian Workforce Volume 2 Sector - TalentCorp, accessed on May 27, 2025, https://talentcorp.com.my/images/uploads/publication/195/Impact-Study-of-Artificial-Intelligence-Digital-and-Green-Economy-on-the-Malaysian-Workforce-Volume-2-Sector-Electrical-and-Electronics-1747879257.pdf
33. Prediction And Contribution of Electrical & Electronics (E&E) Industry Towards

Malaysia Gross Domestic Product (GDP) By - Atlantis Press, accessed on May 27, 2025, https://www.atlantis-press.com/article/126009231.pdf
34. Malaysia AI Assisted Healthcare Technology - International Trade Administration, accessed on May 27, 2025, https://www.trade.gov/market-intelligence/malaysia-ai-assisted-healthcare-technology
35. (PDF) Navigating Artificial Intelligence in Malaysian Healthcare: Research Developments, Ethical Dilemmas, and Governance Strategies - ResearchGate, accessed on May 27, 2025, https://www.researchgate.net/publication/386754872_Navigating_Artificial_Intelligence_in_Malaysian_Healthcare_Research_Developments_Ethical_Dilemmas_and_Governance_Strategies
36. Impact Study of Artificial Intelligence, Digital, and Green Economy on the Malaysian Workforce Volume 2 Sector - TalentCorp, accessed on May 27, 2025, https://talentcorp.com.my/images/uploads/publication/200/Impact-Study-of-Artificial-Intelligence-Digital-and-Green-Economy-on-the-Malaysian-Workforce-Volume-2-Sector-Medical-Devices-1747879539.pdf
37. Malaysia: Leveraging AI to Enhance Healthcare - OpenGov Asia, accessed on May 27, 2025, https://opengovasia.com/2025/02/07/malaysia-leverages-ai-to-improve-healthcare/
38. Artificial Intelligence: The Catalyst for Malaysia's Technological Leap, accessed on May 27, 2025, https://knowledgecom.tech/artificial-intelligence-the-catalyst-for-malaysias-technological-leap/
39. AI Fintech Market in Malaysia: Industry Analysis and Forecast (2024-2030), accessed on May 27, 2025, https://www.stellarmr.com/report/AI-Fintech-Market-in-Malaysia/1690
40. Malaysia AI Companies Driving Real Growth with Smart Tech Solutions, accessed on May 27, 2025, https://www.cfoacc.com.sg/malaysia-ai-companies-driving-innovation-growth-digital-transformation
41. How embedded finance and AI are reshaping Malaysia's finance sector, accessed on May 27, 2025, https://asianbankingandfinance.net/event-news/how-embedded-finance-and-ai-are-reshaping-malaysias-finance-sector
42. How AI & FinTech Are Transforming Finance Careers in Malaysia - Hiredly, accessed on May 27, 2025, https://my.hiredly.com/advice/future-finance-ai-fintech-malaysia
43. Bridging the Digital Divide: Leveraging AI for Inclusive Transformation in Rural Communities, accessed on May 27, 2025, https://www.usaii.org/ai-insights/bridging-the-digital-divide-leveraging-ai-for-inclusive-transformation-in-rural-communities
44. AI in Business Process Management (BPM) - ABBYY, accessed on May 27, 2025, https://www.abbyy.com/blog/ai-in-business-process-management/
45. From RPA to BPM with AI: The Next Frontier in Business Process Automation - Cognizant, accessed on May 27, 2025, https://www.cognizant.com/nl/en/insights/blog/articles/from-rpa-to-bpm

46. Exploring the adoption of Artificial Intelligence in SMEs: an investigation into the Malaysian business landscape - ResearchGate, accessed on May 27, 2025, https://www.researchgate.net/publication/387555195_Exploring_the_adoption_of_Artificial_Intelligence_in_SMEs_an_investigation_into_the_Malaysian_business_landscape
47. 4 Ways Malaysian SMEs Can Leverage AI to Boost Their Business - CapBay, accessed on May 27, 2025, https://capbay.com/4-ways-malaysian-smes-can-leverage-ai-to-boost-their-business/
48. Impact Study of Artificial Intelligence, Digital, and Green Economy on the Malaysian Workforce Volume 2 Sector - TalentCorp, accessed on May 27, 2025, https://talentcorp.com.my/images/uploads/publication/198/Impact-Study-of-Artificial-Intelligence-Digital-and-Green-Economy-on-the-Malaysian-Workforce-Volume-2-Sector-Global-Business-Services-1747879429.pdf
49. Impact Study of Artificial Intelligence, Digital, and Green Economy on the Malaysian Workforce Volume 2 | TalentCorp, accessed on May 27, 2025, https://talentcorp.com.my/images/uploads/publication/196/Impact-Study-of-Artificial-Intelligence-Digital-and-Green-Economy-on-the-Malaysian-Workforce-Volume-2-Energy-and-Power-1747879324.pdf
50. Microsoft's 2025 Work Trend Index: Malaysian workforce and leadership align on intelligent agent integration, accessed on May 27, 2025, https://news.microsoft.com/en-my/2025/05/08/microsofts-2025-work-trend-index-malaysian-workforce-and-leadership-align-on-intelligent-agent-integration/
51. AI in Talent Assessment | Talogy, accessed on May 27, 2025, https://talogy.com/en/knowledge-hub/ai-in-talent-assessment/
52. A REVIEW ON ARTIFICIAL INTELLIGENCE IN TALENT MANAGEMENT FOR EMPLOYABILITY - Journal of Informatics Education and Research, accessed on May 27, 2025, https://jier.org/index.php/journal/article/download/1953/1632/3401
53. The Real Impact of AI on SMEs - Key Numbers & Insights - PCG, accessed on May 27, 2025, https://pcg.io/insights/real-impact-ai-smes-key-numbers/
54. AI Case Studies | EY Malaysia, accessed on May 27, 2025, https://www.ey.com/en_my/services/ai/case-studies
55. MDEC To Push For 25.5 Pct Digital Economy Contribution To Malaysia's GDP By End-2025, accessed on May 27, 2025, https://bernama.com/en/news.php?id=2393715
56. MDEC partners Zhejiang University to spur AI, digital innovation economy - TNGlobal, accessed on May 27, 2025, https://technode.global/2025/04/22/mdec-partners-zhejiang-university-to-spur-ai-digital-innovation-economy/
57. Digital Ministry says additional support for SMEs will help empower sector; entrepreneurs urged to leverage AI, data, accessed on May 27, 2025, https://malaysia.news.yahoo.com/digital-ministry-says-additional-support-064229854.html
58. Government Grants and Incentives Available for Malaysian SMEs - CapBay,

accessed on May 27, 2025, https://capbay.com/government-grants-and-incentives-available-for-malaysian-smes/
59. 18 Latest SME Grants for Malaysia's Businesses (2025) - VeecoTech, accessed on May 27, 2025, https://www.veecotech.com.my/blog/grant-for-sme/
60. Growing Malaysia'sAI talent pool - The Star, accessed on May 27, 2025, https://www.thestar.com.my/news/education/2025/02/16/growing-malaysiasai-talent-pool
61. AI Disrupts Job Market for Malaysia's Fresh Graduates - Asia Education Review, accessed on May 27, 2025, https://www.asiaeducationreview.com/technology/news/ai-disrupts-job-market-for-malaysia-s-fresh-graduates-nwid-3324.html
62. Malaysia - APCDA - Asia Pacific Career Development Association, accessed on May 27, 2025, https://asiapacificcda.org/malaysia-information/
63. Report: Clarity on AI's impact crucial for governance framework - The Edge Malaysia, accessed on May 27, 2025, https://theedgemalaysia.com/node/745246
64. Data Sharing Act 2025 – Overview and Key Provisions. - RDS Partnership, accessed on May 27, 2025, https://www.rdslawpartners.com/post/data-sharing-act-2025-overview-and-key-provisions
65. Key Takeaways of the Data Sharing Act 2025 - NAZMI ZAINI CHAMBERS, accessed on May 27, 2025, https://nzchambers.com/key-takeaways-of-the-data-sharing-act-2025/
66. Building An AI-Ready Malaysia: Why Data And AI Governance Must Take Centre Stage, accessed on May 27, 2025, https://www.businesstoday.com.my/2025/04/27/building-an-ai-ready-malaysia-why-data-and-ai-governance-must-take-centre-stage/
67. Malaysia's AI revolution: Embracing the future with knowledge, ethics, and innovation — KP Chiew | Malay Mail, accessed on May 27, 2025, https://www.malaymail.com/news/what-you-think/2025/04/13/malaysias-ai-revolution-embracing-the-future-with-knowledge-ethics-and-innovation-kp-chiew/172895
68. A Majority of Malaysian Businesses Intrigued by the Potential of AI in Achieving Sustainability Goals Whilst Energy Consumption and Security Concerns Hinder Full Adoption - Malaysia SME®, accessed on May 27, 2025, https://www.malaysiasme.com.my/a-majority-of-malaysian-businesses-intrigued-by-the-potential-of-ai-in-achieving-sustainability-goals-whilst-energy-consumption-and-security-concerns-hinder-full-adoption/
69. Understanding AI Implementation in Digital Advertising Among Retail SMEs in Malaysia - International Journal of Research and Innovation in Social Science, accessed on May 27, 2025, https://rsisinternational.org/journals/ijriss/articles/understanding-ai-implementation-in-digital-advertising-among-retail-smes-in-malaysia/
70. Understanding AI Implementation in Digital Advertising Among Retail SMEs in Malaysia, accessed on May 27, 2025,

https://www.researchgate.net/publication/387722204_Understanding_AI_Implementation_in_Digital_Advertising_Among_Retail_SMEs_in_Malaysia
71. Industry 4.0 readiness and strategic plan failures in SMEs: A comprehensive analysis - PMC, accessed on May 27, 2025, https://pmc.ncbi.nlm.nih.gov/articles/PMC12091723/
72. A Framework for Bridging the Digital Divide: Improving Connectivity and Opportunities in Rural Malaysia | Request PDF - ResearchGate, accessed on May 27, 2025, https://www.researchgate.net/publication/390210924_A_Framework_for_Bridging_the_Digital_Divide_Improving_Connectivity_and_Opportunities_in_Rural_Malaysia
73. Preparing Malaysia workforce for an AI-driven 2025 - The Malaysian Reserve, accessed on May 27, 2025, https://themalaysianreserve.com/2025/01/08/preparing-malaysia-workforce-for-an-ai-driven-2025/
74. A university course towards Artificial Intelligence : r/malaysia - Reddit, accessed on May 27, 2025, https://www.reddit.com/r/malaysia/comments/1jmlocb/a_university_course_towards_artificial/
75. 4 Artificial Intelligence degrees in Malaysia (2025) - Study Abroad, accessed on May 27, 2025, https://www.educations.com/artificial-intelligence/malaysia
76. 2025 Top 8 Universities in Malaysia Best for Data Science Degree Course, accessed on May 27, 2025, https://eduspiral.com/about-us-eduspiral-consultant-services/advise-best-course-study-top-private-universities-malaysia/choosing-your-course/best-computing-courses-top-universities-malaysia/best-big-data-science-analytics-course-top-universities-malaysia/top-universities-in-malaysia-best-for-data-science-data-analytics-course/
77. 2 Bachelors degrees in Data Science in Malaysia (2025) - Study Abroad, accessed on May 27, 2025, https://www.educations.com/bachelors-degree/data-science/malaysia
78. Impact of Artificial Intelligence in TVET and STEM Education among Higher Learning Students in Malaysia | Journal of Research in Mathematics, Science, and Technology Education - SPM Online, accessed on May 27, 2025, https://spm-online.com/jrmste/index.php/journal/article/view/15
79. Fostering AI Literacy in TVET and Professional Development Frameworks for Educators in the 21st Century, accessed on May 27, 2025, https://www.igi-global.com/viewtitle.aspx?TitleId=377116&isxn=9798337311425
80. KNOWSKILLS TVET COLLEGE – Practical Learning, Lifetime Success, accessed on May 27, 2025, https://www.knowskillstvet.com/
81. Launching: AI Literacy Curriculum for Teaching and Learning Staff - Artificial intelligence, accessed on May 27, 2025, https://nationalcentreforai.jiscinvolve.org/wp/2025/05/20/launching-ai-literacy-curriculum-for-teaching-and-learning-staff/

82. Preparing Malaysia workforce for an AI-driven 2025 - MIDA | Malaysian Investment Development Authority, accessed on May 27, 2025, https://www.mida.gov.my/mida-news/preparing-malaysia-workforce-for-an-ai-driven-2025/
83. Digital Technology Industry - HRD Corp, accessed on May 27, 2025, https://hrdcorp.gov.my/indsf/digital-technology-industry

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