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民思政策研究所
POD Research Institute

Advance version

Can Hong Kong be an AI leader in Asia?

A Comparative Analysis with the Region's Other Advanced AI Economies

Unveiling Hong Kong's AI Landscape

Can Hong Kong Be AI Leader in Asia?

A Comparative Analysis with the Region’s Other Advanced AI Economies

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Executive Summary

This research examines Hong Kong's current state of artificial intelligence (AI) development and compares it with Singapore, Japan and Mainland China. Using longitudinal data (2021–2025) and stakeholder interviews, the report evaluates Hong Kong's performance across seven AI ecosystem factors and proposes policy directions for Hong Kong to compete with Singapore in the next stage of AI development.

Research Approach

Two methods were used:

1. Indicator and quantitative analysis based on the IMF's AI Preparedness Index (2023) together with the IMD World Digital Competitiveness Rankings (2021–2025). Seven analytical dimensions were applied, including:
   - AI infrastructure
   - Human capital
   - Technological innovation
   - Policy and regulation
   - Adaptive attitudes
   - Business agility
   - IT integration
2. Stakeholder interviews with industry practitioners provided qualitative evidence on how policies and realities interact, revealing practical constraints behind quantitative trends.

Key Findings

1. Hong Kong's Society Shows the World's Highest Adaptability to AI

Among Hong Kong, Singapore, Mainland China and Japan, Hong Kong ranked first in adaptive attitudes in 2025. Two structural factors explain this:

- Very open attitudes to globalisation (ranked 2nd among 69 economies)
- Full digital penetration, including high levels of smartphone and internet use, e-commerce and online retail

This indicates that Hong Kong's society is technologically ready for rapid AI expansion.

2. Business Adoption of AI Shows a “V-shaped” Recovery

Business agility rankings experienced a clear V-shape:

- 2021: 7th
- 2023: dropped to 16th
- 2025: recovered to 7th

The rebound is linked not only to post-2022 outsourcing of AI projects to local firms, but also to new ecosystem policies including the I&T Development Blueprint, the AI Subsidy Scheme with supercomputing support, and accelerated smart-city and digital-government deployment. Hong Kong’s strongest areas in 2025 were:

- Opportunity and threat perception
- Use of big data analytics

3. IT Integration and Cybersecurity Remain Structural Weaknesses

IT integration improved, but two structural constraints persist:

i. *Cybersecurity capacity is insufficient*

- Cybercrime cases reached 12,500 in 2024, up 62% from the previous year.
- Singapore performs better: most cyber cases are scams, reflecting stronger systemic protection.

ii. *Privacy protection and legal frameworks are weak, creating uncertainty for investors and users.*

iii. *Talent Shortage and Low R&D Investment*

- AI talent supply is a persistent bottleneck. Unlike Singapore and Japan, Hong Kong invests relatively little in education and research:
- R&D expenditure as % of GDP:
  - Hong Kong: 1.11%
  - Singapore: 1.8%
  - Japan: 3.7%
  - Mainland China: 2.65%

Although Hong Kong has many high-skill workers, AI talent supply is insufficient, and employers report difficulty recruiting. Talent has become the key medium-term constraint on AI development.

iv. Legal, Copyright and Data Governance Frameworks Lag Behind

Compared with Singapore, Hong Kong lacks:

- A dedicated AI law
- A unified regulatory system
- Clear rules on copyright and text/data mining (TDM)

The "opt-out mechanism" suggested for TDM may shrink available training data sources, increasing uncertainty for model development.

Cross-border data transfer rules are unclear, and the Personal Data (Privacy) Ordinance does not fully cover algorithm transparency or deepfake risks.

These gaps discourage investment and model training.

Hong Kong vs Singapore: A Competitive Timeline

The comparison reveals a meaningful time lag:

- Singapore began AI policy in 2014 (Smart Nation), followed by:
  - AI Singapore (2017)
  - National AI Strategy 1.0 (2019)
  - AI Verify (2022)
  - National AI Strategy 2.0 (2023)
- Hong Kong only established a clear AI direction in 2022, with the creation of the Digital Policy Office in 2024.

Hong Kong is approximately 8–9 years behind Singapore.

The next phase (post-2025) represents direct competition. If Hong Kong does not accelerate, Singapore's lead in institutional design will widen.

Nine Strategic Directions for Hong Kong

Industry interviews highlight seven priorities to challenge Singapore. Key recommendations include:

- A unified AI compliance framework would reduce business uncertainty and increase confidence
- Launch a Hong Kong version of AI Verify to build trust for both AI product

developers and users
- Upgrade the current supercomputing centre into a national-scale AI supercomputing centre
- Build a city-scale Digital Twin Hong Kong for simulation and decision-making
- Establish an AI apprenticeship system (AIAP model) for practical training
- Develop a local large language model, improving on HKChat which currently lags Singapore's Ask Jamie
- Leverage the Greater Bay Area to create a regional advantage unattainable by Singapore

Conclusion

The report reaches ten main conclusions:

- Hong Kong lags behind Singapore in AI development by around 6 to 7 years.
- Hong Kong's digital adaptability is world-leading, but AI ecosystem development lags behind.
- Singapore has centralised coordination, whereas Hong Kong remains fragmented.
- Hong Kong lacks international data engagement.
- Hong Kong requires trust standards similar to AI Verify.
- A national supercomputing centre is a critical industry demand.
- Government must strike a balance between over-regulation and non-intervention.
- Supercomputer investment faces fiscal challenges but requires a long-term plan.
- Hong Kong can still overtake, but the window is narrowing.

Hong Kong has the social readiness, digital foundation and ambition to become an AI leader, but governance, legal clarity and talent supply are now the decisive factors. The coming years are critical. Fast and coordinated action is required to prevent long-term competitive disadvantage against Singapore.

Section 1. Introduction

Artificial intelligence (AI) is rapidly transforming the foundations of economic competitiveness and governance in Asia. From Singapore's "Smart Nation" strategy to Japan's industrial robotics integration and the Chinese Mainland's large-scale AI infrastructure, the region has emerged as a laboratory for state-led technological transformation. Against this backdrop, Hong Kong faces both opportunity and urgency: it stands as a digitally mature economy—ranked 4th globally in the IMD World Digital Competitiveness Ranking 2025—but still struggles with fragmented coordination and a voluntary regulatory regime. This research is therefore significant because it positions Hong Kong within Asia's evolving landscape of AI governance, seeking to identify how the city can move from technological readiness to institutional coherence.

1.1 Definitional Challenges

Artificial intelligence was first coined by John McCarthy (1955) as "the science of engineering intelligent machines." Since then, AI has expanded beyond symbolic reasoning to include machine learning, deep learning, and autonomous decision-making systems capable of improving through data-driven experience. This conceptual breadth creates both opportunities and risks for governments that seek to regulate AI with or without stifling innovation. In academic realm, there is no consensus on the definition on it.

1.2 Working Definition and Scope for This Report

For analytic clarity, this report defines AI as computational systems that perform tasks requiring human-like intelligence by learning from data, reasoning over representations, and interacting with their environment to achieve specific goals. We distinguish between:

Narrow AI — domain-specific algorithms such as machine learning models, natural language processing, computer vision, and predictive analytics currently applied in public administration.

General AI (AGI) — theoretical systems with cross-domain reasoning and adaptive

autonomy not yet realised technically or institutionally.

The analysis is limited to narrow AI, with empirical examples drawn from Hong Kong SAR's digital governance ecosystem. The technological scope includes machine learning (supervised, unsupervised, and reinforcement learning), natural-language generation and translation, computer vision, time-series forecasting, causal inference, and decision-support systems. Speculative or autonomous AGI is excluded to maintain policy relevance and auditability.

1.3 Research Questions of the Present Study

The rapid evolution of artificial intelligence across Asia served as the wake-up call for Hong Kong as the small open economy. Against this backdrop, Hong Kong and Singapore have emerged as two of the region's most closely matched contenders for AI leadership. Then, Singapore can serve as the benchmark for contrast and comparison. Yet the two economies have taken divergent paths: Singapore has spent a decade building a unified, centralised and enforceable governance system—anchored by Smart Nation, AI Singapore, the national supercomputing centre and AI Verify, a quasi-certification system—while Hong Kong only began accelerating its institutional and infrastructural reforms after 2022, despite strong digital fundamentals. This asymmetry raises the first core research question of this study: Is Hong Kong still lagging Singapore in AI development? Establishing Hong Kong's relative position is essential for understanding the strategic urgency and policy choices it faces.

If Hong Kong is indeed still behind, the next analytical step is to understand why. Both the IMF's AI Preparedness Index and IMD's World Digital Competitiveness data point to a persistent structural gap rooted not in technology or market dynamism, but in institutional coherence. Fragmented governance, the absence of a statutory AI definition, inconsistent risk standards across bureaux, weaknesses in cybersecurity and privacy enforcement, and the lack of a national-level supercomputing centre together constrain Hong Kong's readiness to scale AI safely and systematically. These structural constraints give rise to the second and third research questions: What factors cause Hong Kong to fall behind Singapore? and What weaknesses within Hong Kong's own governance and institutional architecture hinder the city's AI development? Addressing these questions allows the study to pinpoint the binding

constraints that shape Hong Kong's current AI trajectory.

Yet Hong Kong's position is not defined solely by disadvantage. The city possesses significant, and in some cases unique, sources of competitive strength: top-ranked societal adaptability and digital literacy, a globally trusted financial ecosystem, rapid improvements in compute capacity, and a hybrid "East-meets-West" regulatory environment that can bridge Mainland China's technological scale with developed-economy governance norms. These advantages motivate the fourth question: What strengths can Hong Kong leverage to accelerate AI development? Finally, with these strengths and weaknesses identified, the study turns to the forward-looking strategic question at the heart of Hong Kong's policy debate: How can Hong Kong surpass Singapore and position itself as an AI leader in Asia? By integrating all five research questions into one analytical chain, the report builds a logically connected framework that moves from diagnosis to opportunity, and ultimately to strategic policy design.

1.4 Methodology

This study integrates quantitative benchmarking with qualitative institutional analysis. The IMF's AI Preparedness Index (AIPI) serves as the conceptual framework, assessing readiness across four core pillars: AI infrastructure, human capital, technological innovation, and legal frameworks. Complementing this, the IMD World Digital Competitiveness Ranking (WDCR, 2021–2025) provides longitudinal data to track Hong Kong's progress over time. Emphasis is placed on IMD's "Future Readiness" factor, encompassing the sub-factors of Adaptive Attitudes, Business Agility, and IT Integration, which correspond closely to societal acceptance, organizational adaptability, and technological integration in the context of AI adoption.

Regional benchmarking is incorporated through comparative data from Singapore, Japan, and the Chinese Mainland, offering a broader Asia-Pacific perspective on Hong Kong's relative positioning. Notably, Cisco's AI Readiness Index is excluded from the analysis, as its scope is limited to enterprise-level AI adoption and does not

extend to national-level preparedness.[1] However, a face-to-face interview with an AI insider is taken to supplement documentary information with an expert's first-hand experience in Section 4 of the present research report.

1.5 Analytical Framework Adopted

This report adopts the IMF AI Preparedness Index (AIPI) as the conceptual starting point. The AIPI evaluates AI readiness through four pillars: AI infrastructure, human capital, technological innovation, and legal frameworks — collectively termed institutional readiness. However, the IMF's dashboard, launched on 25 June 2024, remains in its first edition and thus lacks historical depth for trend analysis. To overcome this limitation, we extend the IMF logic by employing the IMD World Digital Competitiveness Ranking (WDCR) series (2021–2025). The five-year IMD dataset provides a richer temporal basis for comparison and allows quantitative tracking of how economies build digital and AI capabilities over time. Moreover, it is important to note that the IMD framework was originally designed to measure digital competitiveness, not AI per se. Hence, this study deliberately narrows its scope to the "Future Readiness" factor, which best captures AI adoption capacity through its three sub-factors: Adaptive Attitudes (AA), Business Agility (BA), and IT Integration (ITi). These dimensions directly mirror AIPI's institutional readiness logic — assessing societal acceptance, organizational agility, and technological integration as proxies for AI governance maturity.

1.6 Report Layout

This report is structured to move from context to policy action, linking Hong Kong's AI readiness with pathways for institutional reform.

The opening section introduces the research background, objectives, and methodology, explaining how the *IMF AI Preparedness Index (AIPI)* and *IMD World Digital Competitiveness Ranking (WDCR)* are combined to assess Hong Kong's

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[1] Please see the report: Cisco, Cisco AI Readiness Index: Hype Meets Reality — Hong Kong Edition (November 2024), https://www.cisco.com/c/dam/m/en_us/solutions/ai/readiness-index/2024-m11/documents/cisco-ai-readiness-index-hk.pdf.

technological and institutional performance.

Section 2 situates Hong Kong within Asia's AI landscape, comparing governance structures, infrastructure, talent development, and legal frameworks across Singapore, Japan, and the Chinese Mainland. It highlights the city's definitional ambiguities, fragmented coordination, and challenges in translating digital capacity into effective governance.

Section 3 deepens the analysis through the IMF–IMD framework, identifying Hong Kong's strengths in infrastructure and adaptability, alongside weaknesses in cybersecurity, regulation, and inter-bureau alignment. Case studies on Singapore's *AI Verify* and Japan's industry–academia collaboration illustrate best practices relevant to Hong Kong's hybrid model.

Section 4 transforms these insights into a policy roadmap for 2025–2030, outlining ten strategic actions on governance consolidation, ethical legislation, infrastructure upgrading, talent cultivation, and cross-border cooperation.

Section 5 focuses on stakeholder engagement, recommending structured collaboration among government, academia, and industry, and greater citizen participation to build trust in AI governance.

The final section summarises Hong Kong's comparative position and strategic opportunity—to bridge China's industrial scale with the regulatory precision of Singapore and Japan—and concludes that advancing from digital capability to institutional coherence is essential for Hong Kong's next phase of AI-driven governance.

Section 2. Empirical Context and Comparative Insights

2.1 Comparison of AI Readiness

As a foundational comparison of Hong Kong's standing within Asia's AI-readiness landscape, Table 1 synthesizes qualitative dimensions, contrasting governance models, infrastructure maturity, talent and R&D depth, legal enforceability, and adoption priorities across Singapore, Japan, Hong Kong, and the Chinese Mainland. It highlights Hong Kong's hybrid structure—combining governmental coordination through the Digital Policy Office with private-sector agility—as a middle path between Singapore's centralized Smart Nation Office and Japan's federated, industry-driven system.

Table 1. Comparative Analysis of AI Readiness Factors Across Singapore, Japan, Hong Kong, and Chinese Mainland

Dimension	Singapore	Japan	Hong Kong	Chinese Mainland
Governance Model	Centralised (Smart Nation Office)	Federated (METI & Prefectures)	Hybrid (DPO-led coordination)	Centralised (CAC oversight)
Digital Infrastructure	Mature, integrated	Industrial, advanced	Rapidly expanding	State-orchestrated (250+ data centres)
Talent & R&D	Strong STEM pipeline	Corporate R&D depth	Fragmented, import-dependent	Scale-intensive, elite shortages
Legal Framework	Mandatory AI Verify	Codified guidelines	Voluntary principles	Mandatory for generative AI
Adoption Focus	Public services	Industrial robotics	Governance & Smart City pilots	Industrial upgrading

Sources: Analysis by POD Research Institute. Please refer to Appendix J

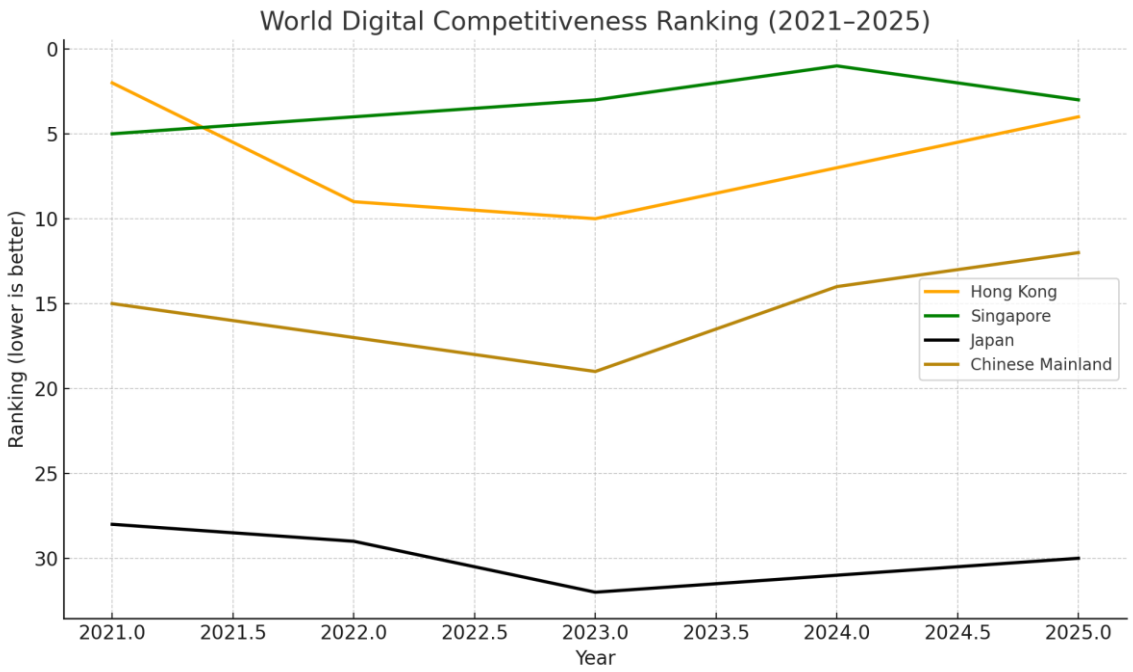
Table 2. Comparative AI Readiness (IMF's AIPI 2025)

Economy	AIPI (2025)	Digital Infrastructure	Human Capital	Technical Innovation	Legal Framework
Singapore	≈ 0.80	Very High	High	High	High
Japan	≈ 0.73	High	High	High	High
Hong Kong	≈ 0.70	High	Medium	High	Medium
Chinese Mainland	≈ 0.63	Very High	Medium	High	Medium

Source: International Monetary Fund (IMF), AI Preparedness Index (AIPI) Dashboard, accessed November 4, 2025, https://www.imf.org/external/datamapper/datasets/AIPI.

Quantitative benchmarks from the IMF's AI Preparedness Index (2025), alongside historical IMD trends, solidify Hong Kong's "medium-high-readiness" status and underscore persistent gaps in Future Readiness that warrant targeted institutional reforms. Table 2 complements this qualitative view with quantitative benchmarks from the IMF's AI Preparedness Index (2025), showing Hong Kong's composite score (≈ 0.70) positioned below Singapore (≈ 0.80) and Japan (≈ 0.73) but ahead of the Chinese Mainland (≈ 0.63). Together, these tables establish the report's analytical baseline: Hong Kong is classified as a "medium-high-readiness" economy—strong in digital infrastructure and innovation capacity but moderate in human-capital depth and legal-regulatory enforcement—thereby justifying the subsequent focus on institutional reform and governance coherence. Figures 1–5 illustrate the historical trends that justify this report's methodological choice. Figure 1 shows steady improvement in Hong Kong's overall IMD ranking (2021–2025) but no breakthrough in Future Readiness (from 2021-2025) — highlighting where AI-readiness gaps persist and explaining its sluggish development.

Figure 1. Trend of Selected Economies' IMD Digital Competitiveness Rank (2021–2025)



Source: IMD World Digital Competitiveness Rankings (2021–2025). Data compiled from IMD World Competitiveness Center reports; Appendix K.

2.1.1 Interpreting the Ranking Trend (2021–2025)

A) Looking at the overall World Digital Competitiveness rankings of four selected economies (Figure 1):

- Singapore: It rose steadily from 5th place in 2021 to 1st in the world in 2024, then eased slightly to 3rd in 2025. It is a stable global frontrunner that has remained near the top for many years.
- Hong Kong: It ranked as high as 2nd in 2021 but dropped to 9th–10th in 2022–2023. It then climbed back to 7th in 2024 and further to 4th in 2025, forming a "high–fall–rise again" V-shaped trajectory. This suggests that while Hong Kong's digital infrastructure has always been strong, in recent years there has been renewed catching-up on the policy and application fronts.
- Chinese Mainland: It has generally stayed between 12th and 19th place. There was a slight decline between 2021 and 2023, but in the last two years it has recovered to 12th. It can be regarded as being in the upper-middle tier, advancing steadily on the back of industrial strength and computing power.

- Japan: It has hovered between 28th and 32nd place with little change. This indicates that its digital and AI capabilities are still concentrated mainly in the industrial and corporate sectors, while overall digital competitiveness—especially on the government and societal fronts—has improved more slowly.

Visually, in the line chart, Hong Kong (orange line) bottoms out in 2023 and then moves upward; Singapore (green line) stays close to the very top; Mainland China (dark yellow line) improves gradually; and Japan (black line) is almost flat.

B) Are John Lee administration's AI Measures Related to Hong Kong's Post-2023 Ranking Rebound?

Strictly speaking, IMD's official reports do not explicitly state that "because of a particular AI policy, Hong Kong's ranking rose from 10th to 4th." However, we can make reasonable inferences from the policy timeline and the structure of the IMD indicators.

IMD's World Digital Competitiveness framework consists of three main pillars: Knowledge (talent and education), Technology (ICT infrastructure and technology adoption), and Future Readiness (digital attitudes, business agility, and IT integration). AI policies cut across these areas:

- Part of them belong to "Technology" – supercomputing centres, data centres, cloud and networks.
- Part of them belong to "Future Readiness" – government-driven digital transformation and the practical use of AI in the public and private sectors.
- Plus, elements of "Knowledge" – talent development and research funding.

Since John Lee took office in 2022, his administration has indeed rolled out a series of initiatives related to the digital economy, digital government, and AI (AI is the subsector of the former two in terms of classification). In terms of timing, these measures broadly coincide with the post-2023 phase when Hong Kong's ranking began to rebound in the table. While we cannot attribute the change to a single cause, these policies are very likely to be one of the key background factors.

C) Major AI Policies and Institutions Directly Related to AI / Digital Competitiveness (Chronological)

1. 2022: The Innovation, Technology and Industry Bureau & the *Innovation and Technology Development Blueprint*

- In July 2022, the sixth-term HKSAR Government expanded the former "Innovation and Technology Bureau" into the Innovation, Technology and Industry Bureau (ITIB), unifying re-industrialisation and innovation and technology under one planning framework, with Sun Dong as Secretary.
- In December 2022, ITIB released the Hong Kong Innovation and Technology Development Blueprint, identifying "promoting the digital economy and building a smart city" and "developing AI and data science" as key directions for the next 5–10 years.

This stage laid the top-level design for the later improvement in rankings from 2023 onwards. When IMD evaluates Hong Kong, it would see clearer strategies and institutional arrangements.

2. 2023: Policy Address Proposes an AI Supercomputing Centre, Data Economy and Digital Government

The 2023 Policy Address clearly proposed:

- Setting up, in phases and under Cyberport, an Artificial Intelligence Supercomputing Centre (AISC) to provide high-performance computing from 2024 onwards, supporting local research and the AI industry.
- Accelerating digital government development, making good use of AI, cloud and big data, and rolling out more "one-stop digital" services.

These measures directly correspond with IMD indicators under "Technology" and "Future Readiness," such as network infrastructure, cloud usage and the maturity of e-government. They are favourable to Hong Kong's scores in 2024–2025.

3. 2024: Establishment of the Digital Policy Office, Launch of the *Ethical AI Framework* and the AI Subsidy Scheme

Digital Policy Office (DPO)

- Originating from proposals in the 2023 Policy Address, the DPO was formally established in July 2024. It merged the former Office of the Government Chief Information Officer and the Efficiency Office, and is placed under ITIB.
- Its functions include coordinating digital government, data governance and IT policy, and promoting more systematic adoption of AI and digital technologies across government departments.

Ethical AI Framework

- In July 2024, DPO issued the Ethical AI Framework, which sets out AI principles, governance models, lifecycle guidance and risk-assessment templates. Although voluntary, it provides both public and private organisations with an operational set of AI governance guidelines.

AI Supercomputing Centre Commencement and AI Subsidy Scheme

- Cyberport's AI Supercomputing Centre formally came into operation in December 2024, providing large-scale GPU computing power to support local research and industry.
- In the 2024–25 Budget, the Government earmarked HK$3 billion for a three-year AI Subsidy Scheme (AISS) to subsidise research institutions, enterprises and government departments in using the supercomputing resources.

Taken together, this package of hardware (compute power) plus software (ethical framework and subsidy scheme) is one of the clearest signals to IMD that the Government is actively building an AI ecosystem. It should significantly help Hong Kong's scores in "Technology" and "Future Readiness," and the timing matches well with the marked rebound in rankings in 2024 and 2025.

4. 2024: Policy Statement on Responsible AI Use in Financial Markets

- In October 2024, the Financial Services and the Treasury Bureau issued the Policy Statement on the Development of Responsible Artificial Intelligence in the Financial Markets, explicitly aiming to strike a balance between promoting innovation and managing risks (cybersecurity, privacy, intellectual property), and setting out regulatory expectations for financial institutions using AI.

This helps reinforce Hong Kong's credibility as an international financial centre in terms of AI-related financial regulation, and indirectly affects IMD's assessment of the "regulatory environment" and "business agility."

5. 2025: Generative AI Guideline and Further Investment

- In April 2025, DPO published the Guideline on the Use of Generative Artificial Intelligence Technology and Applications in Hong Kong, detailing the technical background, risks, governance principles and practical recommendations for generative AI, with support from a dedicated "Generative AI Research Centre."
- The 2025 Budget and the 2025 Policy Address further proposed developing Hong Kong into an international hub for AI and data-science industries, including expanding data centres and launching talent-exchange programmes.

D) Overall Assessment: The Ranking Rise Is Multi-Factor, but AI Policy Is a Key Driver

Putting everything together:

- In terms of timing:
    - The 2022 Blueprint and institutional reshuffle set the direction for digital and AI development;
    - From 2023 onwards, the supercomputing centre, digital government and data-governance initiatives began to be implemented;
    - In 2024–2025, DPO, the AI Subsidy Scheme, the Ethical AI Framework, the financial-market AI policy statement and the generative-AI guideline were launched in succession.
      This policy timeline broadly matches the "fall then rebound" pattern of Hong Kong's rankings from 2023 in Figure 1.
- In terms of substance:
    - The Government is pushing simultaneously on hardware (supercomputing and data centres), institutions (DPO, new policy statements, frameworks

and guidelines), funding (HK$3 billion subsidy), and talent / applications (financial markets, research projects).

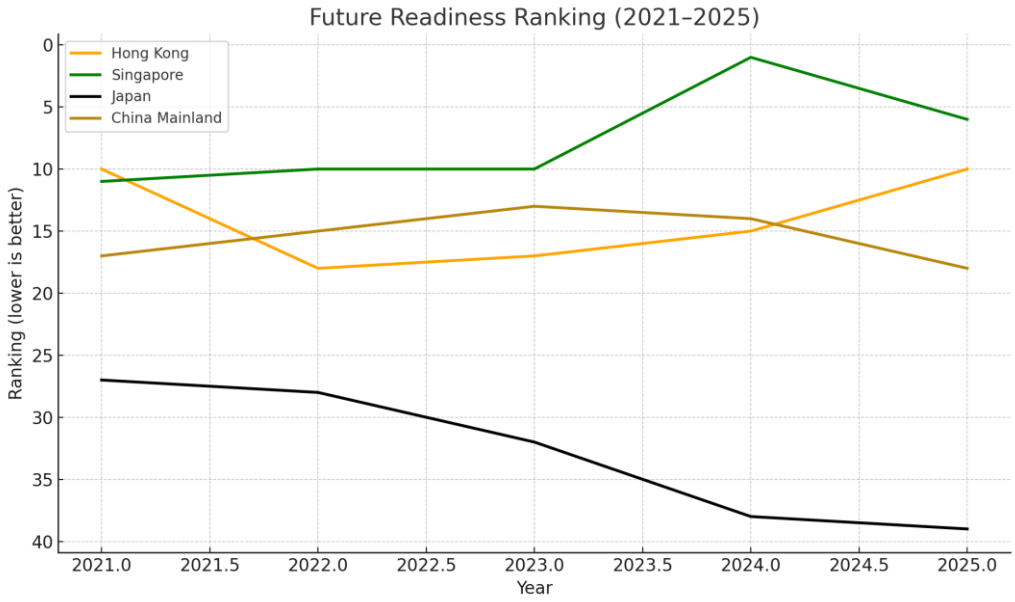
    - This aligns well with IMD's requirements across Technology, Knowledge and Future Readiness.

- In terms of causality, we must remain cautious:

    - IMD never explicitly states "because of DPO or the AI Supercomputing Centre, Hong Kong's ranking rose." Rankings are also influenced by macro-economic conditions, corporate investment, talent flows, and developments in other economies.

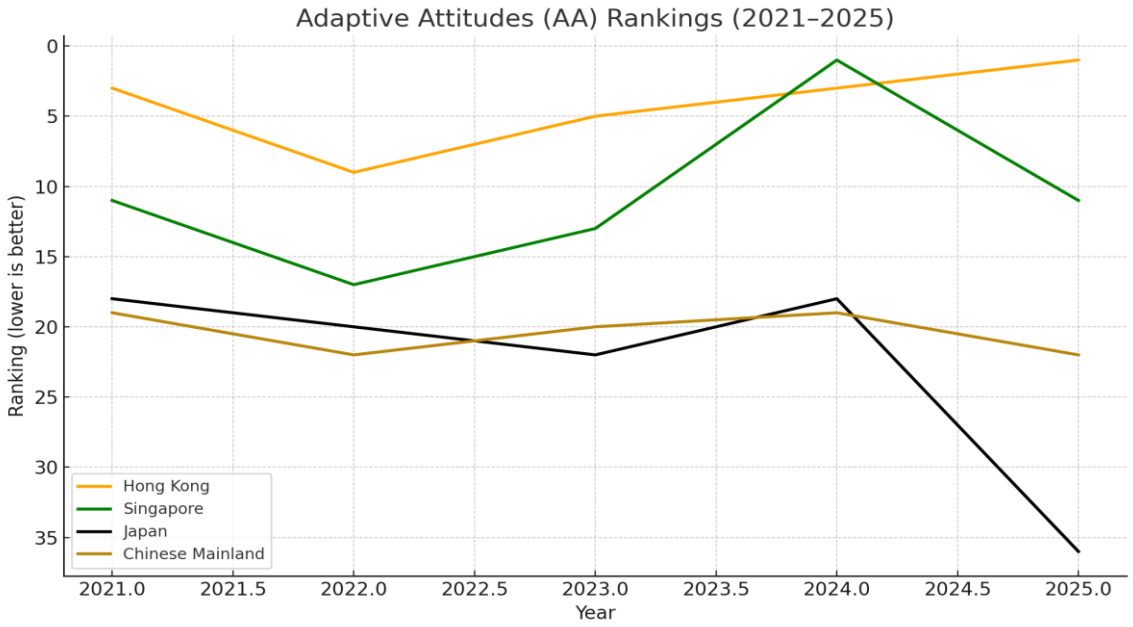
Even so, it is reasonable to say that the John Lee administration has elevated AI and the digital economy to the core of Hong Kong's overall economic and governance strategy, strengthening external confidence that Hong Kong now has a clear roadmap, dedicated institutions and concrete resources. This is very likely one of the important background factors behind the renewed rise of Hong Kong's digital competitiveness rankings after 2023.

Figure 2. Future Readiness Rankings of Selected Economies, 2021–2025



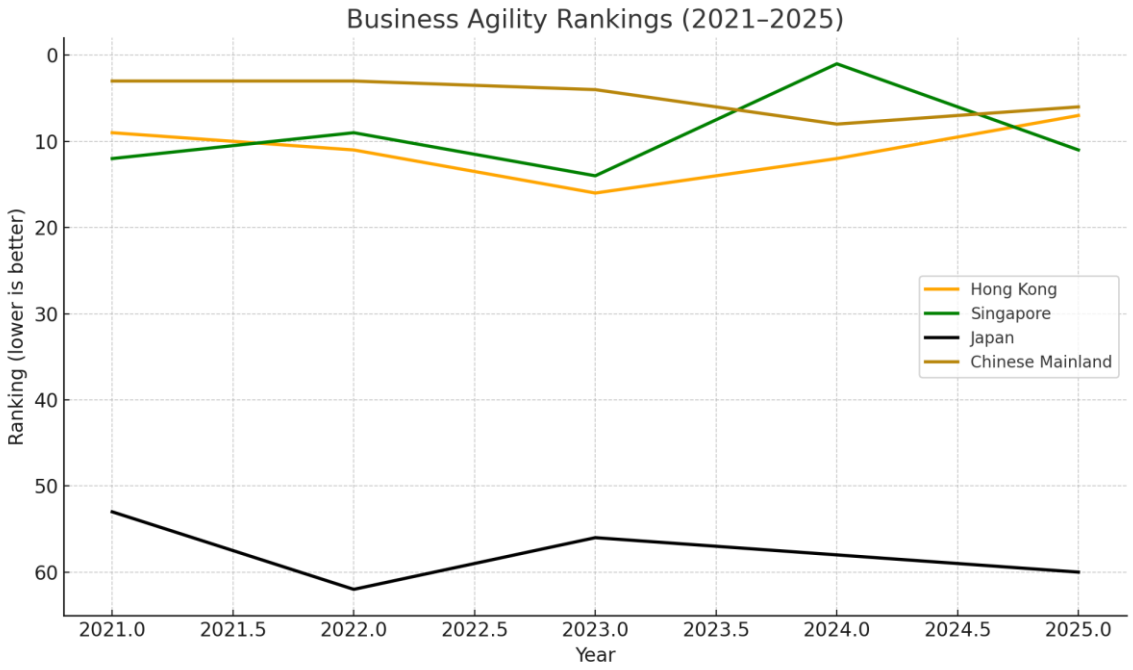
Source: IMD World Digital Competitiveness Rankings (2021–2025). Data compiled from IMD World Competitiveness Center reports. (2021–2025)

Figure 3. Adaptive Attitudes (AA) Rankings, 2021–2025



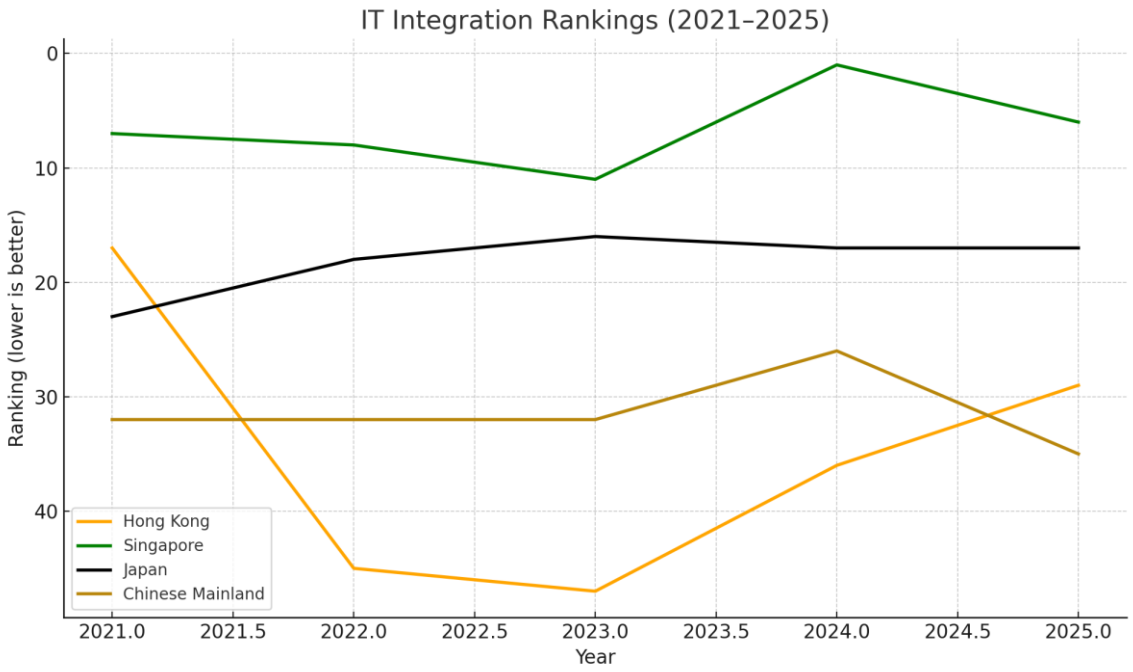
Source: IMD World Digital Competitiveness Rankings (2021–2025). Data compiled from IMD World Competitiveness Center reports. (2021–2025)

Figure 4. Business Agility (BA) Rankings, 2021–2025



Source: IMD World Digital Competitiveness Rankings (2021–2025). Data compiled from IMD World Competitiveness Center reports. (2021–2025)

Figure 5. IT Integration (Iti) Trend (2021–2025)



Source: IMD World Digital Competitiveness Rankings (2021–2025). Data compiled from IMD World Competitiveness Center reports. (2021–2025)

Remarks: Within Future Readiness:

- Adaptive Attitudes measures societal flexibility and human capital responsiveness.
- Business Agility measures firms' innovation and responsiveness to market change.
- IT Integration measures governmental and institutional digital implementation capacity.

Figures 2 through 5 disaggregate the three sub-factors of Future Readiness—Adaptive Attitudes, Business Agility, and IT Integration—and reveal a consistent pattern: Hong Kong performs exceptionally well in societal adaptability but continues to lag in institutional and organisational digitalisation. The most striking trend appears in Adaptive Attitudes (Figure 3), where Hong Kong rises to first globally by 2025, reflecting a population that is digitally literate, receptive to innovation, and willing to incorporate AI tools into daily life. This sustained improvement from 2021 to 2025 demonstrates that public readiness is not Hong Kong's constraint; rather, it is a competitive strength that provides the societal foundation for large-scale AI adoption.

However, the remaining two sub-factors—Business Agility and IT Integration—tell a different story. Business Agility (Figure 4) shows modest improvement but fluctuates within a relatively narrow range, indicating that while enterprises are open to

experimentation, organisational processes and managerial structures have not evolved at the same pace as public attitudes. The limited year-on-year gains from 2021 to 2025 imply that corporate digital transformation remains uneven, especially among SMEs and traditional sectors, which slows the diffusion of AI across the economy.

The weakest and most persistent constraint is IT Integration (Figure 5). Despite Hong Kong's excellent digital infrastructure, its IT Integration rank declines or stagnates throughout 2021–2025, remaining in the lower third of global economies in the comparison group. This performance signals structural gaps inside government and large business organisations: outdated legacy systems, slow procurement cycles, fragmented data architectures, and inconsistent departmental adoption of AI-enabled tools. The multi-year stagnation in IT Integration contrasts sharply with the rapid rise in Adaptive Attitudes, creating a widening gap between what society is capable of adopting and what institutions can implement.

Taken together, these visual patterns confirm a deeper structural insight: Hong Kong's AI-readiness challenge is not technological capacity but governance and organisational coherence. The five-year trends show a city whose population is ready, whose infrastructure is strong, but whose institutions have not kept pace with digital transformation. The divergence between high Adaptive Attitudes and low IT Integration—from 2021 through 2025—illustrates that without substantial reforms in inter-bureau data sharing, accountability structures, and public-sector IT modernisation, the city's AI development will continue to be constrained not by societal resistance but by institutional inertia.

These historical trajectories justify the report's emphasis on governance reform: to translate Hong Kong's digital strengths into AI-readiness, Future Readiness must be driven not only by societal adaptability but by modernised systems, interoperable data infrastructures, and coherent cross-bureau coordination.

2.2 Societal Acceptance

Table 3 compares how people in Hong Kong, Mainland China, Singapore, and Japan use artificial-intelligence tools in their personal lives and workplaces, serving as an indicator of each society's acceptance of AI. Although definitions of "use" differ—

some surveys refer to weekly, others to daily engagement—the data collectively reveal how deeply AI is embedded in everyday routines and work cultures across these economies.

Table 3. Ranking: Relative Level of Societal Acceptance of AI Usage (2025)

Rank	Economy	Overall Level of Societal Acceptance
1 **Singapore**	Very High	Pervasive personal and workplace use—≈80% daily in personal life and 74% in workplaces—shows AI has entered mainstream digital habits and work culture.
2 **Chinese Mainland**	High	Widespread exposure to AI-enabled apps and 93% workplace adoption suggest strong normalization of AI use, though personal-life "weekly" data are less detailed.
3 **Hong Kong**	Moderate-High	39% weekly personal and 45% weekly work usage reflect a society rapidly adapting to AI but with remaining gaps in inclusion (age, gender, SME readiness).
4 **Japan**	Moderate-Low	Despite high awareness, only 31.2% workplace usage and no robust weekly personal-use data indicate cautious or selective adoption, likely constrained by cultural and organizational conservatism.

Sources: Public First (2025) Seizing Hong Kong's AI Opportunity; KPMG & University of Melbourne (2025) Trust, Attitudes and Use of AI – China Snapshot; Milieu Insight (2025) & Infocomm Media Development Authority (2025) Singapore Digital Economy Report 2025; GMO Research & AI (2025) Japan's Generative AI Market Survey. (see the footnotes for the mentioning of this table)

In Hong Kong, 39 per cent of adults use AI weekly in their personal lives and 45 per cent at work. Adoption is largely self-driven rather than imposed by employers, reflecting curiosity and a growing comfort with AI. Yet the presence of digital divides among age and gender groups shows that full societal inclusion has not been achieved.[2]

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[2] Public First, Seizing Hong Kong's AI Opportunity (2023), https://aiopportunity.publicfirst.co/handouts/Seizing_Hong_Kongs_AI_Opportunity.pdf?utm_source=chatgpt.com.

Chinese Mainland shows far stronger engagement. The KPMG Global Trust in AI study reports that 93 per cent of employees use AI for work, with about half doing so weekly or daily. Although comparable figures for personal use are lacking, China's extensive ecosystem—spanning payment systems, e-commerce, and content creation—indicates deep societal integration. The scale of this exposure suggests a high level of practical acceptance, even if ethical debates lag behind.[3]

Singapore leads the region in both usage and trust. Around 80 per cent of citizens use AI daily for personal purposes, and 73.8 per cent of workers rely on it for tasks such as brainstorming, writing, and automation. This reflects not only widespread adoption but normalization, underpinned by clear regulation, strong digital literacy, and institutional confidence in government oversight.[4]

Japan presents a more cautious pattern of adoption compared with its regional peers. According to a 2025 survey by GMO Research & AI, only 31.2 per cent of Japanese workers reported that they are currently using or have used generative-AI tools in their workplace. Although public awareness of such tools is relatively high—over 70 per cent—regular personal use remains moderate, with overall adoption still below half of the population. The same research notes that many Japanese respondents cite uncertainty about the usefulness of generative AI or a preference for human judgment in decision-making. These findings suggest that Japan's slower pace of integration reflects not resistance to technology itself, but a broader cultural tendency toward caution, accuracy, and incremental change within hierarchical workplace structures.[5]

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[3] KPMG & University of Melbourne. (2025). Trust, Attitudes and Use of Artificial Intelligence: A Global Study 2025 – China Snapshot. KPMG International. Retrieved from https://kpmg.com/cn/en/home/insights/2025/05/trust-attitudes-and-use-of-artificial-intelligence-a-global-study-2025.html

[4] Milieu Insight. (2025, September 12). 80% of Singaporeans Use AI Daily, But Few Trust It for Financial or Mental-Health Advice. DigitalCFO Asia. Retrieved from https://digitalcfoasia.com/milieu-insight-80-of-singaporeans-use-ai-daily-but-few-trust-it-for-financial-or-mental-health-advice/; Infocomm Media Development Authority. (2025, October 6). Singapore Digital Economy Report 2025. Retrieved from https://www.imda.gov.sg/resources/press-releases-factsheets-and-speeches/press-releases/2025/singapore-digital-economy

[5] GMO Research & AI. (2025, September 1). Generative AI Adoption Trend in Japanese Businesses 2025. Retrieved from https://gmo-research.ai/en/resources/studies/2025-study-gen-AI-2-jp

Overall, Singapore exhibits the highest societal acceptance of AI, followed by Chinese Mainland, with Hong Kong showing moderate but rising openness and Japan remaining reserved. The contrast demonstrates that acceptance depends not only on access to technology but also on trust, culture, and governance—factors that shape how societies choose to integrate AI into daily life.

2.3 Regional Variations in Definition and Governance

Across Asia, definitional clarity has directly shaped the trajectory of AI policy.

Singapore's Model AI Governance Framework—first released in 2019 and updated in 2020—provides practical guidance for implementing responsible and trustworthy AI. Rather than offering a strict technical definition, it adopts a functional understanding of AI as technologies that emulate aspects of human cognition such as reasoning, perception, and learning to generate outputs or decisions. The framework establishes a risk-based approach to AI governance that integrates key principles including accountability, explainability, robustness, and auditability. These measures aim to align technical standards with legal and ethical obligations, particularly those under the Personal Data Protection Act (PDPA). The framework's second edition expanded practical guidance for industry application, clarifying concepts such as human-in-the-loop decision-making, stakeholder communication, and data management. This governance architecture has since been reinforced by the AI Verify testing framework, launched in 2022 by Singapore's Infocomm Media Development Authority (IMDA), which operationalises the framework's principles by providing tools for organisations to test and validate their AI systems for transparency and accountability.

Japan's AI Strategy 2022 defines AI broadly as "a system to realize intelligent functions," often based on machine learning but not limited to it, without distinguishing between "narrow" and "general" AI.[6] It promotes Responsible AI through principles such as fairness, transparency, accountability, and security, adopting an agile, soft-law governance approach to foster innovation and international collaboration, with the national government—particularly through inter-ministerial

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[6] Cabinet Office of Japan. (2022). AI Strategy 2022. Government of Japan. Retrieved from https://www8.cao.go.jp/cstp/ai/aistratagy2022en.pdf

coordination involving bodies like METI and MIC—serving as a comprehensive coordinator while sharing roles between public and private sectors. [7] Chinese Mainland legislation emphasises security and social stability within state-led governance of generative AI, defining AI broadly as "technological systems capable of generating content and decisions."

By contrast, Hong Kong SAR has not yet codified a single official definition of AI. Its Digital Policy Office (DPO) and Innovation and Technology Commission use the term pragmatically to cover data analytics, machine learning, and automation projects in public services. This flexibility encourages experimentation but risks ambiguity in accountability and ethical review. Section 2.3 will illustrate it with examples.

2.4 Policy Implications for Hong Kong SAR

Definitional ambiguity within Hong Kong's AI ecosystem creates three major policy risks, each observable in current government or public-sector practice:

2.4.1 Regulatory Uncertainty — Inconsistent interpretation across bureaux

Because Hong Kong lacks a single statutory definition of "artificial intelligence," departments apply the term inconsistently when designing or auditing projects. For instance, the Digital Policy Office's (DPO) Generative AI Technical and Application Guideline (2025) defines AI narrowly in terms of text, image, and code generation, while the Innovation and Technology Commission (ITC) classifies AI more broadly as "data-analytics technologies." This divergence complicates legal compliance: one department may treat predictive models as ordinary analytics, while another demands AI-specific risk assessments. Without a unified legal definition, the translation of ethical principles—fairness, transparency, accountability—into binding procurement clauses remains uneven and difficult to enforce.

2.4.2 Fragmented Accountability — Ambiguity in ownership of outcomes

When AI initiatives cut across multiple bureaux or are co-developed with private partners, the absence of definitional boundaries blurs responsibility for outcomes and

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[7] Ibid.

bias mitigation. A case in point is the Food and Environmental Hygiene Department's smart-hygiene sensing project, which integrates computer-vision analytics with data dashboards maintained by an external vendor. Because the project is labelled an "IoT pilot" rather than an "AI system," no single bureau is accountable for ensuring algorithmic accuracy or privacy compliance. [8]Similar coordination gaps were noted in autonomous-vehicle trials in North Lantau: The Transport Department handled licensing, while the DPO oversaw data policy, yet neither held full oversight of safety-related algorithms. This fragmentation weakens both ex-ante review and ex-post accountability.[9]

2.4.3 Public Trust Deficit — Opacity in communication with citizens

Ambiguous terminology also erodes public confidence in government-led AI projects. Some Hong Kong residents saw a "smart kitchen-waste machine" installed in their public housing estate, assumed it could automatically pulverize and recycle food waste on the spot, and were surprised to discover it still required manual removal of waste, highlighting how the term "smart" (智能) had misled expectations,[10] and some expressed discomfort, especially during the turbulent street protests in 2019, with "AI-enabled surveillance" without understanding its actual functions.[11] Public

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[8] Information Services Department, Hong Kong Special Administrative Region Government. (2025, May 7). Government announces latest situation of fresh water cooling towers in Hong Kong [Press release]. https://www.info.gov.hk/gia/general/202505/07/P2025050700546.htm?fontSize=1

[9] Infomalangraya. (n.d.). Driverless bus crash highlights Hong Kong's AI governance gap. https://infomalangraya.com/English/driverless-bus-crash-highlights-hong-kongs-ai-governance-gap/

[10]HK01. (2024, August 6). 網民驚見智能廚餘機手動回收 以為係將廚餘打粉 真正智能喺邊度? HK01. https://www.hk01.com/%E9%96%8B%E7%BD%90/1012854/%E7%B6%B2%E6%B0%91%E9%A9%9A%E8%A6%8B%E6%99%BA%E8%83%BD%E5%BB%9A%E9%A4%98%E6%A9%9F%E6%89%8B%E5%8B%95%E5%9B%9E%E6%94%B6-%E4%BB%A5%E7%82%BA%E4%BF%82%E5%B0%87%E5%BB%9A%E9%A4%98%E6%89%93%E7%B2%89-%E7%9C%9F%E6%AD%A3%E6%99%BA%E8%83%BD%E5%96%BA%E5%91%A2%E5%BA%A6

[11] Infocus Hong Kong. (2024, October 15). Snooping fears take the shine off smart lampposts. https://www.infocushongkong.com/breaking-news/snooping-fears-take-the-shine-off-smart-lampposts;

confusion re-emerged when FEHD's rodent-detection system was reported as using "AI cameras," although the department later clarified that the system primarily used image recognition and not scrutiny purposes. Such communication gaps fuel scepticism about how data are processed and safeguarded. A clear, publicly communicated definition of AI—distinguishing analytical tools from autonomous decision systems—would allow authorities to disclose risks accurately and build informed citizen trust.

2.5 Recapitulation

Section 2 has demonstrated that Hong Kong's position in the Asian AI landscape is defined less by technological capacity than by institutional clarity. The comparative evidence shows that while Hong Kong performs strongly in digital infrastructure and public readiness, its governance framework remains fragmented. The discussion in 2.1 established Hong Kong as a medium-high readiness economy—supported by robust infrastructure but constrained by gaps in human capital and regulatory enforcement. 2.2 revealed that societal acceptance of AI varies sharply across the region: Singapore leads with widespread, regulated usage; China follows with mass, ecosystem-based integration; Hong Kong exhibits moderate but growing openness; and Japan remains cautious due to cultural conservatism. 2.3 and 2.4 illustrated that these differences are rooted in definitional and institutional factors. Where Singapore and Japan codify broad yet functional definitions of AI, Hong Kong's bureaux adopt inconsistent interpretations—one viewing AI narrowly as generative content tools, another equating it with general data analytics—causing regulatory uncertainty, fragmented accountability, and public mistrust. The cumulative insight is that clear definition, legal codification, and inter-bureau coordination are prerequisites for transforming Hong Kong's pilot-driven innovation into coherent governance. Therefore, the recapitulation of Section 2 underscores that conceptual clarity is not a

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Cheng, J. (2019, September 2). Hong Kong Protesters Spy a New Enemy: Lampposts. The Wall Street Journal. https://www.wsj.com/articles/hong-kong-protesters-spy-a-new-enemy-lampposts-11567161002

semantic issue but a structural necessity: without a shared statutory definition of AI, ethical principles such as fairness, transparency, and accountability cannot be uniformly translated into enforceable standards, and the city's transition toward responsible, future-ready AI governance will remain incomplete

Section 3. Comparative Institutional Analysis of AI Readiness in Asia

AI readiness across Asian economies varies widely in both institutional design and implementation capacity. This section positions Hong Kong SAR within a regional context by benchmarking it against Singapore, Japan, and the Chinese Mainland, drawing on IMD World Digital Competitiveness Rankings (2021 – 2025) and IMF AIPI scores. While Hong Kong's ranking remains strong globally, its readiness pattern reveals uneven institutional maturity and fragmented governance compared with its regional peers.

3.1 Hong Kong SAR: Institutional Innovator

Hong Kong SAR performs strongly in *digital education*, *technology infrastructure*, and *adaptive attitudes*, maintaining a top-five IMD ranking since 2023. Yet the governance architecture remains a "soft coordination model" led by the Digital Policy Office (DPO) and the Innovation and Technology Commission (ITC). Being soft means that ethical and generative AI frameworks (2024 – 2025) remain advisory rather than mandatory, creating a gap between institutional ambition and regulatory enforcement.

Therefore, Hong Kong's strengths lie in:

- High digital literacy and training capacity (IMD rank 3rd for Training & Education; see Table 5).
- Expanding AI supercomputing capacity (1,300 → 3,000 PFLOPS by 2026; see Table 4).[12]
- Cross-border collaboration via the Hetao Zone with Shenzhen.

[12] PFLOPS stands for Peta Floating Point Operations Per Second — it's a unit used to measure the computational speed of supercomputers or high-performance processors. Hong Kong's official goal is 3 exaFLOPS (3,000 PFLOPS) by early 2026, with the first phase delivering 1.3 exaFLOPS (1,300 PFLOPS) in 2024.

Table 4: Compute Capacity (Comparable FP64-Equivalent) Ranking

Rank	Economy	FP64-Equivalent PFLOPS	Relative Standing
1	China	~488	Leading (Top 5 worldwide)
2	Japan	~442	Strong (Top 10 worldwide)
3	Hong Kong	~108 – 250	Emerging (Top 10–15 worldwide)
4	Singapore	~30	Niche / Regional

Sources: Cyberport (2024, Dec 21). *AI Supercomputing Centre Officially Commences Operations.* https://www.cyberport.hk/press; National Supercomputing Centre Singapore (2024). *ASPIRE 2A and 2A+ Systems Overview.* https://www.nscc.sg; RIKEN Center for Computational Science & TOP500 (2025). *Fugaku Performance Metrics;* Data Center Dynamics (2025). *China Publishes List of Its Most Powerful Supercomputers. ;*

Weaknesses:

- Absence of statutory AI definition and enforcement mechanism, negatively impacting fairness, transparency, accountability.
- Fragmented accountability across bureaux, a detergence to optimal efficiency.
- Low ranking in Regulatory Framework (12th) and Cybersecurity Capacity (44th) (See Table 5), representing dragging the AI preparedness in Hong Kong.

3.2 Singapore: Governance-First Model

Singapore has maintained global leadership in digital competitiveness (IMD rank #2 in 2025 and #1 in Regulatory Framework). Its Model AI Governance Framework (2019, rev. 2023) translates ethical principles into enforceable standards supported by the AI Verify testing and certification platform. Singapore's AI and digital policies are coordinated under a single central authority (the Smart Nation Office), which ensures that different government ministries and agencies follow consistent rules and standards when developing or using AI systems.

Singapore's AI ecosystem emphasises trust and regulatory compliance as enablers of sustainable innovation, underpinned by a government investment of about S$500 million in AI research, development, and high-performance computing infrastructure.

This governance-first approach, guided by the Model AI Governance Framework (2019, rev. 2023), has strengthened both domestic and international confidence in Singapore's AI strategy and demonstrates strong alignment with global norms such as the OECD AI Principles.

Table 5. IMD 2025 AI-Related Factors (Ranking, out of 69 economies)

Factors / Indicators	**Hong Kong**	**Singapore**	**Chinese Mainland**	**Japan**
Overall Digital Competitiveness	4	3	12	30
Knowledge (Factor)	5	4	18	31
Technology (Factor)	3	2	7	28
Future Readiness (Factor)	10	6	18	45
Training & Education (Sub-factor)	3	21	34	14
Regulatory Framework (Sub-factor)	12	1	23	49
Capital (Sub-factor)	11	8	7	30
Adaptive Attitudes (Sub-factor)	1	11	22	47
Business Agility (Sub-factor)	7	9	6	65
Starting a Business (Indicator)	4	4	21	52
Smartphone Possession (Indicator)	2	7	33	55

Attitudes toward Globalization (Indicator)	2	8	10	54
Government Cybersecurity Capacity (Indicator)	44	3	20	28
Legal Framework for Privacy Protection (Indicator)	49	50	64	13

Source: IMD World Digital Competitiveness Ranking 2025 – Hong Kong SAR, Singapore, Chinese Mainland, and Japan country pages (1 = best out of 69 economies).

The factors, subfactors, and indicators in the table were selected specifically for comparative analysis, taking into account the nature of Hong Kong's economy, which is predominantly driven by financial and trading activities

3.3 Japan: Industrial Integration and Human-Capital Depth

Japan's AI Strategy 2022 outlines a multi-ministry collaboration led by the Cabinet Office, METI, and MEXT. AI is embedded into its industrial and academic sectors through institutions like AIST and RIKEN, bridging the gap between research and commercial deployment.

Key Features:

- Cross-sector R&D centres link universities and private firms.
- Subsidies and regulatory sandboxes encourage AI start-ups.
- Emphasis on explainability and safety in public-service algorithms.

Although Japan's aging demographics limit workforce scalability, its institutional continuity and corporate training depth make it a model for AI-driven industrial policy.

3.4 Chinese Mainland: Scale and Control

China's AI ecosystem is defined by state-driven scale and rapid industrialisation. Through the Ministry of Industry and Information Technology (MIIT) and the Cyberspace Administration of China (CAC), AI development is governed by licensing rules and content controls**.** Massive compute investment (over 250 data centres nationwide) and state funding for AI colleges have built a formidable industrial base. However, stringent data-flow restrictions limit cross-border collaboration and centralised control over public information dissemination on the internet does not necessarily need public-trust transparency as a means of accountability.

3.5 Systematising the Comparative Framework: Governance, Talent, and Infrastructure

To ensure comparability across economies, the following three dimensions structure the analysis:

Table 6. Comparative Framework Dimensions for AI Analysis: IT integration and Policy Indicators

Criterion	Definition	Policy Indicators (IMD / IMF)
Governance Model	Institutional design of AI oversight, regulatory mechanisms, and ethical enforcement.	Regulatory framework rank, legal codification, privacy laws, AI governance institutions.
Talent Policy	Strategy for AI skills development and mobility between academia and industry.	Training & Education rank, STEM pipeline, workforce AI literacy.
Infrastructure Investment	Physical and digital capacity supporting AI deployment.	Technological framework, capital sub-factor, compute capacity.

Table 7. Comparative Matrix (2025 Snapshot)

Dimension	Singapore	Japan	Hong Kong SAR	Chinese Mainland
Governance Model	Centralised Smart Nation Office; a testable, auditable assurance mechanism, AI Verify testing; data-protection law enforced.	Federated model (METI, MIC, Cabinet Office); soft-law codes.	Hybrid DPO + ITC model; Ethical AI Framework and Generative AI Guideline (voluntary).	State-directed (CAC & MIIT); compulsory licensing for generative AI.
Talent Policy	AI Singapore Programme (SG$ 500 m); STEM education embedded nationally.	AIST & RIKEN research centres; corporate training dominant; aging workforce.	HKPC and ASTRI initiatives; Supercomputing Centre supports universities; limited pipeline.	Scale-intensive AI education; strong state funding but elite shortage.
Infrastructure Investment	National compute grid and AI Verify sandbox; 5G coverage > 98%.	Robotics and manufacturing base; regional AI labs.	Cyberport AISC (1,300 → 3,000 PFLOPS by 2026); Hetao Zone for cross-border integration.	> 250 data centres; global top AI R&D spending.

Case Study 1 – Singapore's AI Verify as Information Technology Integration between government and business

In Singapore, the AI Verify Testing Framework (launched 2022) operationalises ethical AI principles by enabling organisations to assess their AI systems against 11 internationally recognised governance principles (such as transparency, explainability, robustness and human oversight). Through its toolkit, firms generate evidence-based

reports on alignment to those principles. While not a universally mandatory certification, the output of AI Verify may support governance assurance and procurement trust. Meanwhile, Singapore's Model AI Governance Framework (including its generative-AI update) offers technical, governance and legal guidance across sectors, but remains voluntary in nature.

Lesson for Hong Kong: Adopting a similar testing regime under the DPO would standardise AI auditing and enhance public trust through a transparent and unified compliance registry.

Case Study 2 – Japan's Industry–Academia Synergy as Information Technology Integration between government and business

Japan's AI Strategy 2022 sets out a coordinated national agenda involving the Ministry of Economy, Trade and Industry (METI) together with major research organisations such as RIKEN and the National Institute of Advanced Industrial Science and Technology (AIST) to advance AI across manufacturing, public services and societal applications. It calls for enhanced R&D, social implementation of AI and the creation of data-infrastructure and a "data economic zone."

Lesson for Hong Kong: Creating joint AI labs between universities and government departments could translate research into policy applications and strengthen evidence-based governance.

Table 8. Numerical and Structural Gap with Singapore and Japan (2025).

Sub-factor / Indicator	**Hong Kong SAR (Rank)**	**Singapore (Rank)**	**Japan (Rank)**	**Gap vs Singapore**
Regulatory Framework	12	1	43	+11 ranks weaker
Legal Framework for Privacy Protection	49	50	32	-1 ranks stronger
Government Cybersecurity Capacity	44	12	28	+32 ranks weaker
Training &	3	21	14	–18 ranks stronger

Education[13]				
Adaptive Attitudes	1	11	36	–10 ranks stronger
Business Agility	7	11	60	–4 ranks stronger

Source: Compiled from Table 3.

Table 8 indicates Hong Kong's Technological Strengths and Institutional Weaknesses in 2025. Hong Kong outperforms its peers in Training & Education and Adaptive Attitudes, showing that citizens and enterprises are digitally ready and eager to adopt AI. However, its Regulatory Framework and Cybersecurity Capacity lag significantly behind Singapore and Japan. The governance gap is thus not technological but institutional: weak regulatory alignment and fragmented accountability lower Hong Kong's score despite strong infrastructure.

3.6 Analytical Takeaway

Applying a consistent three-pillar framework reveals clear patterns:

- Singapore demonstrates governance coherence and regulatory trust.
- Japan illustrates human-capital synergy and industrial application.
- Hong Kong shows adaptive agility but institutional fragmentation.

Hong Kong SAR should move toward an Adaptive Hybrid Governance

[13] In the IMD framework, "Training & Education" is a sub-factor under "Talent" that measures the overall strength of an economy's education and skills system rather than the quantity of AI specialists it produces. The indicator covers the quality of the education system, international school availability, PISA performance, number of science graduates, corporate training expenditure, language ability, management education and the perceived availability of skilled labour. It therefore does not directly capture how many AI engineers or data scientists exist in an economy. Singapore scores lower on this metric because it specialises more in professional and technical education, has fewer international schools, a higher cost of expatriate schooling and a smaller domestic population. Hong Kong, by contrast, scores well due to its high-ranking universities, strong STEM and science output, substantial corporate investment in training, large supply of English-medium education, strong business school and management education, and well-developed postgraduate programmes. As a result, Hong Kong appears very competitive on paper in this indicator even though it still faces shortages of specialised AI talent.

Model, combining Singapore's legal clarity and Japan's collaborative depth to build a more coherent AI ecosystem by 2030.

3.7 Hong Kong's AI Development Positioning

Table 9 illustrated the current situation that Hong Kong sits between Singapore's regulatory maturity and China's industrial scale. Its comparative advantage rests on institutional innovation and policy coherence rather than hardware sovereignty. Future competitiveness will depend on four transitions:

1. From digital readiness to industrial resilience through AI commercialization.
2. From voluntary ethics to codified governance aligned with OECD and AI Verify standards.
3. From pilot-scale projects to system-wide AI integration across public services.
4. Strengthen hardware sovereignty and compute power that promote a complete AI ecosystem.

Table 9. Comparative Interpretation and Regional Positioning

Economy	Institutional Readiness (AIPI)	Technological Readiness (Industrial Metrics)	Interpretation (2025)
Singapore	Very High – coherent policy and ethics frameworks	Moderate – limited chip ecosystem	Governance-first model; balanced AI leadership
Japan	High – mature regulatory clarity	High – robotics, semiconductors	Industrial integration through automation
Hong Kong	Medium-High – strong digital policy and governance	Moderate – dependent on external compute	Institutional innovator; policy-driven AI growth
Chinese Mainland	Medium – fragmented governance	Very High – chip, LLM, quantum R&D	Industrial powerhouse; governance lag

Source: IMF (2025) AI Preparedness Index (AIPI); IMD (2025) World Digital Competitiveness Ranking Report (pp. 55 – 74); POD Research Institute analysis.

3.7.1 Implications for AI Governance

The IMD data indicate that digital competitiveness is increasingly driven by institutional resilience rather than pure technological prowess. Hong Kong's policy challenge lies in translating its governance capacity to a fully blown AI leadership—especially by codifying cybersecurity and privacy standards currently addressed only through voluntary guidelines (e.g., the 2024 Ethical AI Framework and 2025 Generative AI Guidelines), and multiplying its sovereign computer power.

3.8 Beyond Institutional Readiness: The Industrial Dimension

While the Artificial Intelligence Preparedness Index (AIPI) highlights governance maturity, it underrepresents recent industrial accelerations, particularly in China's AI sector. Since 2023, the Chinese Mainland has channelled national resources into building a self-sufficient AI supply chain, spanning chip design (SMIC, Biren), chip manufacturing, large-scale compute infrastructure, and frontier research in quantum AI. These developments have shifted regional competitiveness: China's *technological readiness* now surpasses most Asian peers in terms of hardware sovereignty, R&D intensity, and deployment scale, even if its institutional frameworks trail behind.

By contrast, Hong Kong's comparative strength potentials lie in its endeavour to promote policy coherence, open digital ecosystems, and cross-border data governance, rather than hardware production. The city functions as a bridge economy — a regional testbed for governance frameworks, financial AI applications, and ethical experimentation — supported by initiatives such as:

- Cyberport's AI Supercomputing Centre (AISC), with an initial capacity of 1,300 PFLOPS (expanding to 3,000 PFLOPS by 2026);
- The Artificial Intelligence Subsidy Scheme (AISS) (HK$3 billion), which democratises access to compute power for universities and public institutions; and
- The Digital Policy Office (DPO), which coordinates digital transformation efforts across departments and promotes AI governance guidelines.

These initiatives demonstrate that while Hong Kong may not yet match Chinese

Mainland's industrial capacity, in the long run it excels in integrating AI governance principles, institutional accountability, and cross-sectoral coordination — key attributes of long-term AI readiness.

Despite its shortage in AI computer power and its reliance on local universities' innovative power to generate AI developmental momentum, a well-orchestrate policy window is open for another wave of breakthroughs in hardware investment in San Tin Technopole, Northern Metropolis. Hong Kong Shenzhen Innovation and Technology Par (HKITP) is planned to have an Artificial Intelligence and Robotic Development, focusing on the clustered development of cutting-edge industries such as AI, forming a synergy with Shenzhen's innovation and technology zones. It is strategically adjacent to Shenzhen, forming a cross-border innovation cluster. The proximity allows the national-scale supercomputer center planned there to leverage Shenzhen's relatively lower electricity and water costs, optimizing operational efficiency while facilitating seamless cross-border collaboration in computing power sharing and technological innovation.

3.9 Persistent Structural Weaknesses Impeding Hong Kong's AI Readiness

Table 10. Hong Kong SAR – Weakest Factors (2021 – 2025)

Year	Weakest Factor(s)	Factor Rank	Justification for Weakness Classification
2021	Future Readiness	10th / 64	Despite Hong Kong's strong technology infrastructure, its *IT integration* and *adaptive attitudes* lagged behind peers. Weakness stems from low institutional adoption of digital tools and uneven readiness among firms.
2022	Knowledge & Future Readiness	7th / 63 and 9th / 63	"Knowledge" weakened due to slower progress in R&D and STEM output; "Future Readiness" fell as talent outflow and entrepreneurial dynamism declined post-pandemic.
2023	Knowledge	7th / 64	Persistent weakness in *scientific concentration* (17th) and *training &*

			education (5th → weaker relative to peers) limited knowledge capitalization.
2024	Future Readiness	15th / 67	Largest year-on-year decline (-9 ranks). Survey data show declining perceptions of *digital skills*, *management of cities*, and *foreign talent access*, which IMD flagged as systemic readiness gaps.
2025	Knowledge & IT Integration (subfactor under Future Readiness)	5th / 69 and 29th / 69	While the overall "Knowledge" factor remains top-five, it is relatively weaker against Hong Kong's own peaks in *Technology*. IMD's standard-deviation analysis classed *IT Integration (29th)* and *Cyber security capacity (44th)* as core weaknesses—revealing lagging institutional digitalization.

Sources: IMD World Competitiveness Center. IMD World Digital Competitiveness Rankings (Reports) 2021-2025.

Over the past five years, Hong Kong's AI readiness has advanced technologically but stagnated institutionally. IMD data (2021–2025) show recurring weaknesses in *Future Readiness*, *Knowledge*, and *IT Integration*—signifying structural deficiencies in converting infrastructure into governance capacity (see Table 10).

1. **Institutional Fragmentation and Policy Inertia**
   Despite robust infrastructure, the absence of a statutory AI definition and a central authority leaves governance fragmented. Ethical and generative-AI frameworks remain voluntary, weakening accountability and delaying cross-bureau coordination. This "soft coordination" model hinders consistent enforcement of fairness, transparency, and security.

2. **Cybersecurity and Data-Governance Deficits**
   Ranking 44th in cybersecurity and 49th in privacy protection, Hong Kong faces critical vulnerabilities. Fragmented departmental response mechanisms and weak cyber resilience expose public institutions to operational and reputational risks, undermining both trust and investment confidence.

3. **Talent Bottlenecks and Knowledge Drain**
   Talent shortages persist as over 70% of employers struggle to recruit AI-

skilled staff while only one-third of workers have received formal training. Without sustained education and retention strategies, flagship initiatives like the AI Supercomputing Centre risk underutilisation.

4. **Slow Legal Codification and Ethical Enforcement**
   Unlike Singapore's **AI Verify** or Japan's codified AI guidelines, Hong Kong still relies on voluntary compliance. The absence of binding legal standards weakens investor certainty and limits alignment with global norms such as the OECD and EU frameworks.

5. **Weak Institutional IT Integration**
   Government IT systems remain siloed, with outdated procurement and data-interoperability gaps limiting AI adoption and evidence-based policymaking—core capacities for future-ready governance.

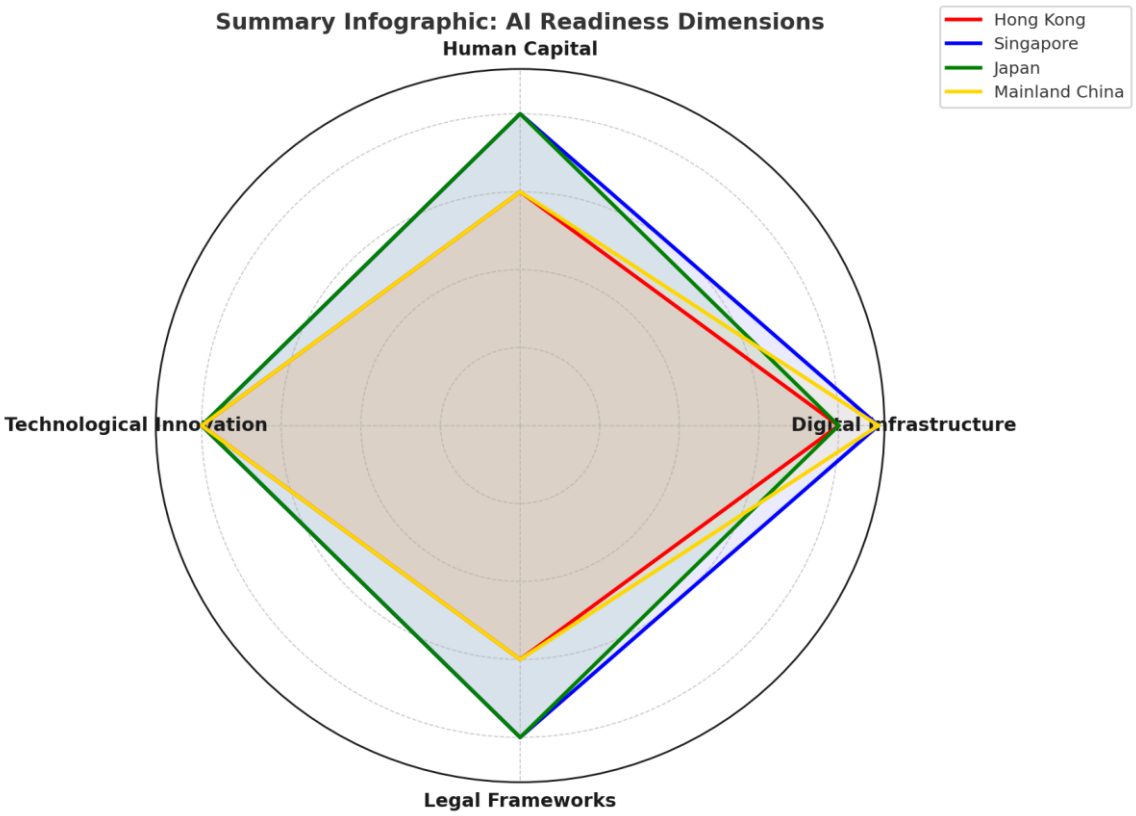
6. **Infrastructure–Implementation Misalignment**
   While massive investments in Cyberport, Hetao, and AI R&D institutes have expanded hardware capacity, the computer power is elevated on a piecemeal basis, and the incremental growth is scattered on different locations in Hong Kong. Such fragmented supercomputing resources—with universities and research institutions operating their own HPC clusters—lead to duplicate investments, high idle rates, elevated operational costs (for electricity, cooling, and labor) that exclude smaller institutions, and disconnected data/computing power that hinders cross-disciplinary collaboration. These inefficiencies, cost barriers, and weak synergy not only waste computing potential for large-scale projects but also undermine Hong Kong's competitiveness in the innovation and technology sector.

3.10 Concluding Perspective

Hong Kong's AI readiness is not static but transitional. Measured by institutional capacity, it ranks among Asia's leaders; measured by industrial sovereignty, it remains a policy hub within a regional value chain anchored by China's rapid hardware and research expansion. To remain competitive, Hong Kong must position itself as Asia's AI governance laboratory — one that leverages its rule-of-law system, global

financial linkages, and academic excellence to complement Chinese Mainland's technological acceleration and align with best practices from Singapore and Japan.

Figure 6:



Section 4. How Can Hong Kong Act As an AI market Leader

4.1 Six Years Apart: Singapore's Head Start and Hong Kong's Catch-Up

The following timeline illustrates how Singapore began building its AI ecosystem almost a decade before Hong Kong.

Singapore's long-term planning has allowed it to integrate computing power, data governance, and AI talent into a single national strategy, whereas Hong Kong only began its structural build-up in 2024.

Table 11: Vertical Timeline Diagram of AI Development (Singapore vs. Hong Kong)

Singapore (Left Column)	Year	Hong Kong (Right Column)
Launch of Smart Nation Initiative, integrating data infrastructure, IoT, and e-government.	2014	Digital 21 Strategy updated as the blueprint for ICT development; digital initiatives distributed across bureaus.
AI Singapore (AISG) launched with S$150M for AI R&D and talent.	2017	Early smart city and fintech pilots; no unified AI governance framework.
National AI Strategy 1.0 and Model AI Governance Framework released.	2019	Pilot-based AI trials (smart lampposts, departmental chatbots). No whole-of-government AI strategy.
AI Verify launched — world's first government-led AI testing and verification toolkit.	2022	AISC feasibility study prepared (announced early 2023).
National AI Strategy 2.0 released with S$1B plan for compute, data governance, and deployment.	2023	Digital Policy Office (DPO) announced; Generative AI Technical Guidelines drafted.
NSCC activates ASPIRE 2A supercomputer (up to ~10 PFLOPS).	2024	Cyberport AISC Phase 1 activated (1,300 PFLOPS) in December; DPO established in July.
Singapore AI start-ups raise ~US$1.2B (significant surge in Southeast Asia).	2025	AISC expands from 1,300 toward planned 3,000 PFLOPS; DPO issues Generative AI guidelines.

Sources: Singapore National AI Strategy 2.0 [https://file.go.gov.sg/nais2023.pdf]; NSCC ASPIRE 2A Overview [https://www.nscc.sg]; Cyberport Press Release Dec 2024; Hong Kong Gov News Apr 15 2025.

Table 11 illustrates the contrasting trajectories of Singapore and Hong Kong in

developing their artificial intelligence ecosystems. Since 2014, Singapore has followed a consistent and centrally coordinated path grounded in a whole-of-government philosophy. Under the Smart Nation framework and successive National AI Strategies (NAIS), the country built national compute infrastructure, introduced clear governance frameworks, established regulatory sandboxes, and implemented legally supported mechanisms such as AI Verify. This long-term, institutionally aligned approach enabled Singapore to scale AI adoption across public services, industry, and research much earlier than its regional peers.

Hong Kong, by contrast, entered the AI development race later, but has accelerated notably in recent years. Its focus has centred on expanding compute capacity through the Artificial Intelligence Supercomputing Centre (AISC), issuing advisory documents such as the Ethical AI Framework and Generative AI Technical Guidelines, and creating new governance bodies like the Digital Policy Office (DPO). These developments represent important progress, but they remain less integrated and less binding compared with Singapore's system-wide regulatory architecture.

Overall, while Hong Kong demonstrates strong technological potential and is investing rapidly in infrastructure, Singapore continues to maintain an advantage in institutional clarity, data governance, cross-departmental coordination, and the nationwide adoption of responsible AI practices. This difference in governance maturity remains the key factor distinguishing the two cities' AI readiness.

4.2 AI- industry veterans' concerns

4.2.1 Interview with AI/IT practitioners

Experts' personal experience is crucial to understanding the hindrance of AI development. It was quite difficult to get in touch with Industry veterans. Thank for the serendipitous encounter with three industry practitioners. The questions asked are about the present situation of AI industry and its bottleneck of growth. The following five questions are crystallized from the interviews.

4.2.1.1 Some common questions about Hong Kong AI industry and Experts' answers

Question 1: Does Hong Kong have too few supercomputing centers and insufficient computing power? Does it meet AI's demand for compute capacity?

Answer to Q1:
Yes, Hong Kong historically has had too few supercomputing centres, and the available compute power was insufficient for large-scale AI work, mainly scientific research projects at universities.

In 2024, Hong Kong launched the Artificial Intelligence Supercomputing Center (AISC) at Cyberport, with Phase 1 delivering 1,300 PFLOPS (AI/mixed precision) and plans to scale to 3,000 PFLOPS in 2025, making it the largest dedicated AI training facility in Hong Kong to date. Thus, saying "Hong Kong has no computing power" is inaccurate. A more precise statement is: Hong Kong's computing capacity is still in its early stages, lagging behind regional leaders like Japan and Shenzhen, and power supply remains a key bottleneck in expansion.

A report by Deloitte in 2024 estimated that "the capacity of the AISC needs to be progressively upgraded with additional computing power up to 15,000 PFLOPS in the long-term. This demand is substantiated by the rapid evolution of AI research, the emergence of LLM, cross-domain collaborations, and Hong Kong's strategic commitment to technological leadership. In the light of the urgency, it is recommended to launch the capacity of at least a few hundred PFLOPS within 2024 as early as possible to meet the demand for computing power. With reference to multiple study findings, it is affirmatively expected that the demand of computing power will grow in an exponential manner in view of the large model development, especially LLM". [14] It goes further that most new supercomputing clusters, or

[14] Deloitte Advisory (Hong Kong) Limited, "Executive Summary of The Report on the Feasibility Study on Establishing an Artificial Intelligence Supercomputing Centre in Hong Kong," commissioned by the Office of the Government Chief Information Officer, Government of the Hong Kong Special Administrative Region, February 2024, https://www.digitalpolicy.gov.hk/en/news/publications/doc/Executive_Summary_for_AISC_Feasi

supercomputing clusters planned for upgrade, are aiming at achieving a performance of 1,000 PFLOPS or above. For instance, Pengcheng Cloud Brain II in Shenzhen is offering at 1,000 PFLOPS scale of computing power and having plans of upgrade towards 16,000 PFLOPS in the next couple of years (around 2024). It is expected that Shanghai city will host multiple supercomputing facilities, providing a total of ~36,000 PFLOPS by end of 2025". Then, it is reasonable that Hong Kong would have contemplated building a nation-scale supercomputer center with large computer power to meet the increasing demand for more "tokens" in the AI field.

Question 2: Is Local Construction of Supercomputing Centres Constrained?

Answer to Q2: Hong Kong does have insufficient supercomputing capacity, as current compute resources—mainly distributed across universities—are fragmented and inadequate for large-scale AI development. This is why the government initiated the Artificial Intelligence Supercomputing Centre (AISC) project: to consolidate capacity and address the shortfall in high-performance computing needed for advanced AI workloads.

The local construction of supercomputing centres is constrained primarily by land and property limitations. High-performance computing facilities require large, structurally reinforced sites with specialised cooling systems, uninterrupted fibre-optic access, and high floor loading.

The second major constraint is electricity capacity, not reliability. Although Hong Kong's grid is among the most reliable in the world (99.999% uptime), supercomputers require enormous power—often 10–30 MW per cluster, plus substantial cooling overhead. Government responses have acknowledged that meeting future phases of AISC or additional HPC facilities will require expansion of power-supply capacity and careful allocation of high-density electrical loads, rather than relying on the existing grid alone.

Question 3: Is it the case Hong Kong's AI industry lacks competitiveness, overly reliant on foreign companies for computing power and services, with core

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technologies residing abroad—increasing operational risks?

Answer to Q3:
This reflects a real structural risk but requires precise framing. Hong Kong enterprises do widely use external cloud computing (e.g., AWS, Microsoft Azure, Google Cloud), and financial regulators (HKMA, SFC, IA) require that outsourcing or cloud usage ensures:

- data retrievability
- audit rights
- subcontractor management
- local regulatory visibility.

In other words, reliance on external computing is not illegal or improper—it is strictly regulated. If managed properly, firms can still ensure data security and oversight. The claim that "core technologies remain abroad" is a cautionary phrasing, but no widespread evidence currently supports this as a systemic issue.

Question 4: In the above regard, an interviewee raised a good point on the present plight of predicament in AI development: Suppose the CEO of an insurance company in Hong Kong wants to make use of AI models to analyze the company's financial data before releasing the annual report. However, are there such AI models available in Hong Kong? If not, he would need to transfer the data overseas to get it done. However, in doing so, it would meet a lot of stringent rules and regulations from various government departments and statutory bodies because of data compliance. How can he overcome the cumbersome procedures?

Answer to Q4: The interviewee tried to express the stakeholders' concerns by pointing out how the CEO can accomplish data transfer. First, comply with sector-specific regulations: The Insurance Authority requires a risk assessment prior to cross-border transfer of financial data, prioritizing local retention of sensitive customer data and maintaining audit trails for financially sensitive data related to annual reports. The Privacy Commissioner for Personal Data (PCPD) mandates adherence to the Personal Data (Privacy) Ordinance (PDPO), including notifying data subjects, obtaining their

consent, and ensuring the receiving party meets equivalent data protection standards, with responsibilities defined via the Commissioner's standard contract templates. If mainland-related data is involved, it must also undergo mainland's cross-border data transfer security assessment or personal information protection certification.

Classify and grade data: Annual report data should be handled in three categories—personal customer data (strictly control cross-border transfer, desensitize if necessary), corporate financial/business data (go through compliance approval and sign contracts), and public data (simplified procedures allowed)—avoiding a one-size-fits-all approach.

Regulatory filing: Financial institutions must complete compliance filings with the Insurance Authority for cross-border data transfers, retain transfer logs and approval records for at least 7 years to facilitate regulatory inspections.

Question 5:
Can we say that Hong Kong's laws are overly strict, indirectly hindering data export (including to mainland China), with even encrypted data facing restrictions? If the HKMA accepted encryption methods, AI companies could expand operations.

Answer to Q5:
This statement is inaccurate. Section 33 of Hong Kong's Personal Data (Privacy) Ordinance (PDPO)—which restricts cross-border data transfers—has not yet come into effect, so there is no blanket prohibition on cross-border data transmission. However, in regulated sectors like finance and healthcare, authorities require that outsourcing or cross-border data transfers meet conditions such as:

- auditability
- regulatory visibility
- data retrievability
- legal risk assessment

Encryption is only one protective measure—it does not automatically grant approval. Thus, Hong Kong's current regime is: "Cross-border transmission is allowed, but

subject to strict regulatory conditions", not a complete ban. Companies can use cross-border or cloud computing within a compliance framework, provided data processing remains under regulatory oversight and audit.

Comprehensive Response & Recommendations

1. Hong Kong is addressing its "hardware shortfall" (via AISC activation), but long-term planning for power and data center capacity is essential.
2. On the "software side", Hong Kong has established a robust regulatory framework—outsourcing and cloud computing have clear legal grounding.
3. It should further promote a "compliant cross-border data flow framework" to support AI model training and regional collaboration.

Question 6: If Hong Kong builds a "national-level supercomputing center," could it largely resolve current compliance barriers?

Answer to Q6: Partially true — such a facility could significantly reduce compliance friction but not eliminate it entirely.
Explanation across four dimensions:

1. Current Compliance Challenges
Hong Kong's AI industry faces two main types of compliance barriers when using cloud or external computing:
(a) Cross-border data transfer restrictions

- For sensitive data in finance, healthcare, or government, strict sectoral regulations make offshore training or analysis difficult.
- Even though PDPO Section 33 is not yet in force, regulators (HKMA, SFC, IA) already mandate that firms ensure data is regulable, traceable, and auditable. Such compliance is strictly implemented.

(b) Operational and trust risks

- Public institutions and regulated entities prefer to avoid placing critical data on overseas servers to evade foreign laws (e.g., the U.S. CLOUD Act, which allows the U.S. government to compel providers to disclose customer data).

- This makes it challenging for local AI firms to safely run model training on overseas clouds, increasing compliance and trust costs.

2. Problems a "National-Level Supercomputing Center" Could Solve
If Hong Kong establishes a true national-grade supercomputing center, it would deliver multiple policy and technical benefits:

Category	Current Issue	Solution via National-Level Center
Data Sovereignty	Sensitive data must remain in Hong Kong and cannot be transmitted abroad	All computations are performed locally in Hong Kong, keeping data within local jurisdiction
Regulatory Trust	Regulators have concerns about cross-border cloud services	Government-led center can provide audit and compliance certification
Latency & Efficiency	Models need to connect to servers overseas or Chinese Mainland	Local computing power significantly reduces latency and improves computational efficiency
Public Sector Applications	Government departments hesitate to use overseas clouds	Center provides a government-grade secure computing environment
Industry Confidence	SMEs lack standardized cloud contracts and regulatory guidance	Center can offer a unified compliance service interface and API

Overall:
Establishing a national-level supercomputing center would resolve approximately 70–80% of compliance barriers related to "data localization, regulatory auditing, and jurisdictional trust."

3. "Soft Compliance" Issues That Cannot Be Fully Resolved

(a) Data Governance and Usage Policies

- Even if data remains in Hong Kong, clear rules are still needed on:

    - who can access it
    - under what conditions
    - how accountability is tracked
- The supercomputing center addresses the hardware layer, but data classification, anonymization, and accountability systems still require strengthening. Then without a data classification reform, even local data cannot enter the local national-level supercomputer centre, that may cause underutilization of such a powerful supercomputer.

(b) Cross-Border Model Collaboration Needs

- Most large-scale AI models require training on international or Chinese Mainland's data. For example, multinational enterprises have to transfer their corporate data to their headquarters for centralized data processing, either overseas or Chinese Mainland.
- A single local center cannot fully replace cross-border collaboration scenarios such as federated learning, a method of training AI models without moving or sharing the underlying data.

(c) Talent and Operational Capacity

- A national-grade high-performance computing (HPC) facility requires many:
    - system engineers
    - data governance officers
    - cybersecurity experts
- Hong Kong still faces a significant shortage of such talent.

(d) Cost and Resource Allocation

- If used only by government departments, the investment will be hard to recover.

- A multi-stakeholder collaboration and open-access model (similar to Singapore's NSCC) must be established to prevent underutilization.

Question 6. Does ASIC Make Hong Kong AI leader in Asia?

Experts in Hong Kong generally agree that elevating AISC to the scale and status of a *national-level supercomputing centre* would represent an important step forward, but not a decisive or sufficient step toward making the city the AI leader in Asia. Compute capacity is a critical enabler of AI innovation, and Hong Kong's planned expansion—moving from dispersed 60 PFLOPS across universities to a consolidated multi-phase cluster targeting up to 3,000 PFLOPS—would significantly strengthen the city's technical foundation. Such an upgrade would allow for more local training of large models, reduce reliance on overseas cloud resources, and support sectors like finance, logistics, healthcare, and smart-city governance.

Moreover, by international standards, a local multi-phase HPC cluster (even at 3,000 PFLOPS) is not equivalent to a national-level supercomputing center. A national-level center is not defined by PFLOPS alone. It also includes:(1) National governance & mission mandate, public funding and national planning, long-term, stable investment, a mandate to support defence, science, weather forecasting, public health, satellite data, genomics, etc. ; (2) Dedicated large-scale facilities, multi-building data centers, massive electrical capacity (100–300 MW, sometimes more), industrial-scale cooling systems, disaster-resilient backup and dedicated network links to research institutions. Hong Kong's cluster will likely operate at much smaller physical scale; (3) Ecosystem functions beyond compute National-level centers also include: AI training platforms, large scientific datasets, national research teams, federated data-sharing networks, multi-institution collaboration platforms, long-term R&D missions, whereas a single cluster cannot replicate these institutional functions.

However, experts emphasise that compute power alone cannot close the regional leadership gap, because Hong Kong still lags in areas where Singapore, Chinese Mainland, and Japan maintain strong institutional advantages. These include statutory AI governance, regulatory clarity, cross-ministerial coordination mechanisms, national data-infrastructure planning, and a mature pipeline of domestic AI talent.

Even with enhanced compute, Hong Kong lacks the "whole-of-government" coherence of Singapore's Smart Nation and National AI Strategy, the industrial-scale ecosystem of Mainland China, and the research–industry integration characteristic of Japan's METI–AIST–RIKEN architecture.

Thus, while upgrading AISC toward national-level status would unquestionably strengthen Hong Kong's competitiveness, it would not, on its own, transform Hong Kong into an Asian AI leader. Rather, it should be understood as one component of a broader strategic repositioning, which must also include legal codification of AI governance, cross-agency data-integration reform, sustained talent development, and clear policy direction for AI adoption across public services and key industries.

In short, raising AISC to national-level scale is a necessary step, but far from sufficient. Without parallel progress on governance, talent, data policy, and institutional coordination, Hong Kong will not be able to surpass Singapore or Chinese Mainland in AI leadership—even with world-class compute power.

4.3 Competing with Singapore

Singapore has already made an early, forward-looking deployment in the digital economy and artificial intelligence, enabling it to secure a leading position in Asia today. If Hong Kong fails to implement substantive improvements in both policy coordination and hardware support, Singapore will continue expanding its dominance in the Asia-Pacific AI market without meaningful competition, ultimately creating a "winner-takes-all" landscape in which Hong Kong may be forced to concede its market leadership.

Based on Appendix L's comparison of the strengths and weaknesses in the AI development pathways of Hong Kong and Singapore, this study distills seven strategic areas that Hong Kong must put into action, as shown in Table 12.

Table 12. Key Priority Areas for Enhancing Hong Kong's Competitiveness Relative to Singapore in AI Leadership

Rank	Strategic Item	Hong Kong's Current Status	Why This Can Help Hong Kong Overtake Singapore
1	Unified AI Governance Framework	Fragmented, multi-agency	Regulatory clarity is what enterprises care about most

		regulation	
2	AI Verify (Hong Kong version) for AI product developers	Absent	Increases trust from AI product users; decisive for attracting foreign investment
3	National-level AI Supercomputing Centre	AISC not yet at scientific research grade	Strengthens research capability and enhances global ranking
4	City-scale Digital Twin	None	Hong Kong can build the world's most data-dense urban digital platform
5	AIAP-HK: National AI Talent Pipeline	None	Talent is the core bottleneck; Singapore is ahead but still catchable
6	Local LLM (Hong Kong LLM)	None	Unique linguistic and legal context gives Hong Kong an advantage in specialised AI models
7	GBA AI Gateway	Strong regional advantage	Singapore cannot replicate this; Hong Kong's most powerful competitive edge

Source: See Appendix L.

Strategic Foundations and Institutional Reform

For Hong Kong to compete meaningfully with Singapore in regional AI leadership over the next five to ten years, it must begin by addressing foundational institutional gaps. The absence of a dedicated National AI Strategy remains the single most significant differentiator between the two economies. Establishing a comprehensive 10-year strategy—complete with measurable targets for compute, talent, regulation, and industrial development—would immediately elevate Hong Kong's international credibility and signal a coherent long-term commitment to AI. This should be paired with a unified governance architecture, such as a Hong Kong AI Authority, which consolidates regulatory oversight currently dispersed across multiple agencies. By creating a single point of accountability for AI standards, regulatory sandboxes, cross-border data rules, and public-sector adoption, Hong Kong could rapidly achieve the policy clarity that global enterprises and investors often cite as a key advantage of

Singapore's SNDGO–IMDA model. A Hong Kong version of "AI Verify"—a technical safety and compliance certification—would further enhance trust and transparency, positioning Hong Kong as a credible and internationally aligned AI jurisdiction.

Infrastructure, Compute, and Smart-City Innovation

Beyond policy coherence, Hong Kong must invest strategically in world-class AI infrastructure to match or exceed Singapore's capabilities. The transformation of the Cyberport AISC into a national-level AI supercomputing centre, equipped with at least 10,000 PFLOPS of AI-precision compute and FP64 capabilities for scientific research, would dramatically strengthen the city's capacity for frontier model development and cross-sector innovation. Coupled with deeper interoperability with GBA supercomputing nodes in Shenzhen and Guangzhou, Hong Kong could build a regional compute network unparalleled in Asia outside of Mainland China. Simultaneously, Hong Kong should launch a city-scale digital twin—integrating 3D urban models, IoT networks, transport systems, climate data, and energy infrastructure—to enable next-generation smart-city AI applications. Such an initiative would not only close the gap with Singapore's Virtual Singapore ecosystem but also offer Hong Kong a distinctive role as a "live urban AI testbed" for sustainable finance, insurance risk modelling, and climate resilience innovations.

Talent, Indigenous Models, and GBA-Driven Competitive Advantage

Sustained AI leadership requires a robust talent pipeline and the development of indigenous AI capabilities. Establishing an AI apprenticeship programme (AIAP-HK) modelled after Singapore's highly successful AIAP would be a decisive step toward resolving Hong Kong's structural talent shortage, enabling the city to train 300–500 AI engineers annually through real sector-based projects in government, healthcare, finance, and urban data. In parallel, Hong Kong should cultivate a home-grown bilingual and bicultural large language model (HK-LLM) tailored to Cantonese, English, and code-mixed Hong Kong linguistic norms, as well as local legal, financial, and regulatory contexts. Such a model would not only strengthen the city's AI identity but also provide unique value propositions for the financial, legal, and insurance sectors in which Hong Kong already excels. Finally, leveraging the Guangdong–Hong Kong–Macao Greater Bay Area as an AI sandbox—through cross-

border data sandboxes, joint testbeds, and a Shenzhen–Hong Kong AI corridor—offers Hong Kong a strategic asymmetry Singapore cannot replicate. This GBA-enabled comparative advantage, when combined with institutional reforms and world-class infrastructure, gives Hong Kong a plausible pathway not only to catch up with Singapore but to surpass it in selected domains of AI-driven economic development.

Section 5. Policy Recommendations: Pathways Toward AI Leadership

Hong Kong's progress in AI readiness is marked by strong digital infrastructure but persistent institutional fragmentation, talent shortages, and incomplete legal codification. Structural weaknesses identified in Section 3—such as undefined statutory AI concepts, siloed IT systems, weak cybersecurity and privacy performance, and insufficient cross-bureau coordination—continue to limit Hong Kong's ability to convert technological assets into governance capacity. Section 4 further demonstrates that regional competitors—Singapore, Mainland China, and Japan—possess coherent national strategies, mature AI governance regimes, and integrated talent ecosystems that Hong Kong has yet to match. Therefore, Hong Kong's policy roadmap must directly address these institutional gaps to build the foundations of AI leadership.

5.1 Competing with Singapore

Singapore has already made an early, forward-looking deployment in the digital economy and artificial intelligence, enabling it to secure a leading position in Asia today. If Hong Kong fails to implement substantive improvements in both policy coordination and hardware support, Singapore will continue expanding its dominance in the Asia-Pacific AI market without meaningful competition, ultimately creating a "winner-takes-all" landscape in which Hong Kong may be forced to concede its market leadership.

Based on Appendix L's comparison of the strengths and weaknesses in the AI development pathways of Hong Kong and Singapore, this study distills seven strategic areas that Hong Kong must put into action, as shown in Table 12.

Establish a Coherent, Whole-of-Government AI Governance Framework

Hong Kong must move beyond voluntary guidelines and clarify the legal and operational scope of AI governance. Section 3 identifies the absence of a statutory AI definition and fragmented departmental responsibilities as key sources of regulatory uncertainty. A unified governance architecture—anchored by an empowered Digital Policy Office (DPO)—is required to standardise procurement, risk management, data governance, security procedures, and model auditing across all bureaux. This shift

mirrors the whole-of-government coherence underpinning Singapore's Smart Nation and NAIS strategies, which Hong Kong currently lacks.

Codify Ethical and Legal Safeguards with Enforceable Standards

Sections 2 and 3 highlight Hong Kong's continued reliance on voluntary ethics frameworks, contrasting sharply with binding mechanisms such as Singapore's AI Verify and Japan's codified AI standards. To build investor confidence and international credibility, Hong Kong should transform the Ethical AI Framework (2024) and Generative AI Technical Guidelines (2025) into legally enforceable requirements aligned with OECD and emerging global norms. These standards must include mandatory bias audits, transparency obligations, human oversight requirements, and sector-specific safeguards in sensitive areas such as healthcare, finance, and law enforcement.

Strengthen Cross-Bureau Data Interoperability and Foundational Digital Infrastructure

Section 3 documents persistent challenges in data interoperability, legacy IT systems, and siloed departmental workflows that hinder scalable AI adoption. To address these, Hong Kong must accelerate its "Digital-First Strategy," as advanced in the 2025 Policy Address, by retiring outdated technologies, digitizing core records, and aligning all bureaux with unified data standards to enhance AI integration in public services. Recent initiatives, such as the Consented Data Exchange Gateway (CDEG)—linked with the Commercial Data Interchange (CDI) in 2023 and expanded in 2025 to include integrations with entities like the Land Registry and Companies Registry—have reduced fragmentation through APIs and standards. The Interoperability Framework further supports e-government services, but full cross-system integration remains ongoing and incomplete. Without further modernization of infrastructure, Hong Kong's large-scale compute investments, including the AI Supercomputing Centre (AISC), risk underutilization.

Build a Sustainable High-End AI Talent Pipeline

Talent shortages are among Hong Kong's most critical structural weaknesses, with over 70% of employers reporting difficulty hiring AI-skilled staff and only one-third of workers receiving formal training. To address this, Hong Kong must implement a comprehensive AI talent strategy covering STEM education, postgraduate capacity, mid-career retraining, and international recruitment. Section 4 emphasises that even with world-class compute, Hong Kong cannot achieve leadership without overcoming its persistent talent deficit, which threatens underutilisation of flagship assets such as the AI Supercomputing Centre (AISC).

Align Compute Expansion With Institutional Capacity and National-Level Planning

Experts cited in Section 4 agree that upgrading AISC toward national-level status is a necessary but insufficient step toward regional AI leadership. While increased compute (1,300→3,000 PFLOPS) strengthens Hong Kong's technical foundation, leadership requires concurrent progress in legal codification, talent development, cross-agency coordination, and data-infrastructure reform. Compute without governance alignment risks underutilisation and cannot close the strategic gap with Singapore or Mainland China, both of which integrate compute planning within national AI strategies.

Create a Government-Wide AI Evaluation and Impact Framework

Consistent with Section 3's finding that infrastructure is not translating into performance, Hong Kong must adopt KPI-based AI evaluation tools that link deployments to measurable improvements in public value, efficiency, and service outcomes. A standardised cost-benefit and risk assessment framework is essential to avoid symbolic pilots and ensure accountability across all bureaux.

Integrate AI, IoT, and Big Data for Urban-Scale Governance

Section 4 identifies Hong Kong's potential to position itself as an "AI governance laboratory" for Asia by applying AI to complex urban systems such as transport, environment, climate prediction and public safety. To unlock this role, the government should pilot an integrated "Urban AI Brain" platform linking cross-departmental real-time data streams. This requires regulatory interoperability and unified technical standards—capabilities currently fragmented across bureaux.

Institutionalise AI-Assisted Policymaking and Public-Sector Innovation

Drawing on Section 3's emphasis on weak policy integration, Hong Kong should formalise the use of natural language processing, predictive analytics, and sentiment analysis to support evidence-based policymaking. A Policy Analytics Unit under the DPO would enable systematic adoption while ensuring safeguards against bias, opacity, and misuse.

Anticipate Geopolitical and Supply-Chain Risks in AI Hardware

Section 3 identifies hardware dependencies as a major vulnerability: U.S. export controls on advanced chips have restricted Hong Kong's access to high-performance GPUs, directly affecting AI training and generative model development. Hong Kong must diversify sourcing strategies, strengthen Mainland partnerships, and expand microelectronics research to sustain compute resilience.

Position Hong Kong as Asia's Leading AI Financial Hub

Section 4 shows that Hong Kong cannot—and need not—replicate Singapore's whole-of-government model. The city's comparative advantage lies in B2B sectors: finance, legal services, capital markets, and professional services. By building an AI-enabled financial regulatory ecosystem, Hong Kong can differentiate itself and achieve leadership in a specialised domain rather than in all aspects of AI development.

Concluding Perspective

According to a document from 2025, Hong Kong's path toward AI leadership requires simultaneous progress across governance, talent, legal frameworks, institutional integration, and compute strategy. Strengthening AISC is only one component; leadership depends on converting technological capacity into institutional capability, regulatory clarity, and globally credible governance models. If Hong Kong successfully aligns these elements, it can evolve from a late starter into a regional leader—particularly in AI governance and AI-driven financial services—by the end of the decade.

5.2 Proposed Roadmap

Hong Kong should roll out AI for the next generation in phases:

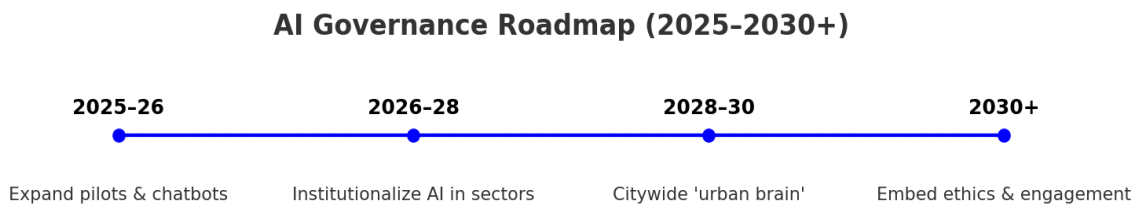
2025–26 (Consolidation): Expand generative AI pilots and deploy smarter GovHK chatbots.

2026–28 (Integration): Embed AI in healthcare, education, and welfare; apply causal AI in policymaking.

2028–30 (Scaling): Launch citywide "urban brain" platforms for transport, housing, and environment.

Beyond 2030 (Continuous improvement): Strengthen ethics, public engagement, and real-time monitoring in all systems.

Figure 8. AI Governance Roadmap (2025–2030+) - Horizontal Timeline



5.3 Proposed Stakeholder Engagement as the Key to Progressive AI Development

For Hong Kong to advance AI in a responsible and sustainable manner, broad-based

stakeholder engagement must be placed at the centre of its strategy. This approach ensures that innovation is not only technologically robust but also socially inclusive and aligned with the city's long-term governance objectives.

5.3.1 Strengthening government–industry–academia collaboration

The government should actively foster partnerships with industry leaders, universities, and research institutes through the establishment of joint laboratories, shared testing facilities, and structured programmes for technology transfer. Secure data-sharing mechanisms with strong privacy and cybersecurity safeguards should be put in place, allowing researchers and businesses to train and evaluate AI models without compromising citizens' rights. Such collaborations can accelerate innovation, while ensuring that AI solutions are tested under real-world conditions and remain aligned with ethical and regulatory standards.

5.3.2 Building inclusive participation platforms

AI governance must also be shaped by society at large. To this end, the government should create consultation forums, regulatory sandboxes, and citizen panels that allow diverse voices to be heard—from business stakeholders and academics to community representatives and ordinary residents. Regulatory sandboxes can provide a safe space for experimentation, where innovators test AI applications under controlled conditions, while citizen panels enable deliberation on sensitive issues such as algorithmic fairness and data protection. These participatory structures not only foster transparency but also enhance public trust by demonstrating that AI deployment serves collective interests rather than narrow commercial gains.

5.3.3 Clarifying rights and responsibilities in AI application

Finally, the government should provide clear legal definitions of AI applications and their intellectual property rights, reducing uncertainty for innovators and investors. At the same time, authorities should commit to publishing plain-language explanations of AI models, including their functions, limitations, and potential risks, so that both experts and the public can understand how these systems operate. Mechanisms for ongoing public input—such as open comment periods, digital platforms for feedback,

or regular reviews—should be institutionalised, ensuring that policies remain adaptive as technologies evolve.

Taken together, these measures will transform stakeholder engagement from a one-off exercise into a continuous process of co-creation. By embedding collaboration, inclusivity, and transparency into AI governance, Hong Kong can cultivate an ecosystem where innovation thrives while public values and trust are safeguarded.

Section 6. Conclusion – Advancing Hong Kong's AI Readiness through Institutional Coherence, National-Level Compute Capacity, and Regional Collaboration

Hong Kong's AI development must be understood within the wider Asian context shaped by Singapore, Japan, and the Chinese Mainland. As the comparative analysis in Sections 2, 3, and 4 shows, Hong Kong continues to lag behind Singapore—addressing Research Question 1—not because its digital infrastructure is weak, but because it entered the AI race later and its institutional development has been slower. Singapore's decade-long head start, built through the Smart Nation agenda, AI Singapore, its National AI Strategies (2019 and 2023), and the unified governance structure of the Smart Nation and Digital Government Office, has created a level of coherence that Hong Kong has only begun to catch up with since 2022.

Why Hong Kong Falls Behind

The analysis shows that Hong Kong's lag is rooted in institutional fragmentation rather than technological inferiority. Hong Kong lacks a statutory definition of AI; risk standards differ across bureaux; accountability is diffuse; cybersecurity and privacy enforcement remain weak; and ethics guidelines remain voluntary. IMD's 2021–2025 trends confirm that the bottleneck lies in Future Readiness, particularly IT Integration, cybersecurity capacity, and regulatory coherence.

Industry interviews further reveal structural constraints: land and power availability limit HPC construction; compute resources are insufficiently coordinated; and cross-border data governance and high-risk transfers remain compliance-heavy, characterized by mandatory security assessments, standard contracts, certifications, and filings for personal or important data transfers, particularly within the Greater Bay Area (GBA).[15]

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[15] Key mechanisms include the 2023 Memorandum of Understanding, the GBA Standard Contract (effective 2024), and the CAC's Provisions on Promoting and Regulating Cross-Border Data Flow (effective March 2024), which require declarations of important data, exemptions only under narrow conditions (e.g., non-important data), and extended validity for assessments. Recent developments in 2025, such as finalized certification measures (October) and clarifications emphasizing narrow

The absence of a national-level supercomputing centre is a particularly significant structural gap, as it restricts large-scale model training, constrains regulated industries from processing sensitive data locally, and reinforces reliance on overseas cloud platforms.

Together, these findings explain why Hong Kong still lags Singapore: not due to weak technological maturity, but because its institutional architecture remains incomplete.

What Strengths Hong Kong Can Leverage

The report also shows that Hong Kong possesses strengths that can accelerate AI development if strategically aligned. These include world-class digital infrastructure; 3.7 million iAM Smart users; high public adaptability (ranked 1st globally); globally trusted financial markets; and a hybrid governance system capable of integrating Chinese Mainland technologies with international regulatory norms.

Crucially, the rapidly developing Artificial Intelligence Supercomputing Centre (AISC) positions Hong Kong to transition from dependence on external compute to possessing sovereign, territory-based AI infrastructure.

However, these strengths can only be transformed into competitive advantage if Hong Kong upgrades both its software layer (governance, regulation, talent, standards) and its hardware layer (compute, data architecture, high-density energy planning). The two dimensions are inseparable.

How Hong Kong Can Become an AI Leader in Asia

To surpass Singapore and position itself as an AI leader, Hong Kong must execute a dual transformation:

1. Hardware Transformation – Building Sovereign Compute Capacity

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exemptions (November), have not significantly eased the burden but rather reinforced structured compliance for businesses and entities.

2. Software Transformation – Achieving Institutional Coherence

The Strategic Role of a National-Level Supercomputing Centre

Across Sections 3 and 4, interviews and benchmarking reveal that building a national-level supercomputing centre is indispensable for Hong Kong's next-stage strategy—for four reasons:

1. Attracting Global Interest and Investment
   A sovereign supercomputing facility signals that Hong Kong is not merely a user of external cloud resources but a producer of AI capacity. This attracts overseas research labs, AI enterprises, fintech companies, and advanced-model developers seeking a trusted, high-compute environment within one of the world's leading financial centres.

2. Serving as the First Building Block of a Complete AI Ecosystem
   Compute capacity is foundational. Without sovereign, high-density compute, Hong Kong cannot develop local LLMs, support biomedical modelling, financial AI risk engines, climate simulation, or smart-city optimisation at scale. A national-level centre is therefore the first step in constructing a wholesome, end-to-end AI ecosystem linking data, compute, governance, talent, and industry.

3. Demonstrating Government Determination and Global Signalling Power
   The establishment of a national-grade facility carries strong symbolic value. It demonstrates the HKSAR Government's long-term commitment to AI excellence, much like Singapore's NSCC did in 2016. Such signalling is essential for investor confidence, talent attraction, international partnerships, and the global repositioning of Hong Kong as an AI hub.

4. Reducing Cross-Border Data-Transfer Friction
   Many regulated sectors—finance, healthcare, insurance, government services—face compliance complexity when transmitting sensitive data overseas. A national-level supercomputing centre allows training and inference to occur entirely within Hong Kong's jurisdiction, solving up to 70–80% of compliance barriers related to data localisation, auditability, and regulatory visibility.

Sovereign compute therefore strengthens Hong Kong's position not only as a technology hub, but also as a trusted data and AI governance jurisdiction.

For these reasons, building a national-level centre is not sufficient to make Hong Kong an AI leader—but it is necessary as a catalytic first step.

Final Analytical Judgement

Synthesising all findings, Hong Kong's long-term AI competitiveness depends on parallel progress in both hardware and software reforms. The establishment of a national-level supercomputing centre will:

- correct a structural gap in Hong Kong's AI architecture,
- anchor global interest in Hong Kong's emerging AI ecosystem,
- signal government-level determination to lead in AI, and
- reduce compliance barriers by enabling sensitive data processing within the territory.

However, compute power alone cannot close the institutional gap with Singapore or match the industrial scale of Mainland China. Only if Hong Kong complements hardware upgrades with decisive software reforms—codifying AI definitions, instituting binding governance standards, modernising legacy digital systems, expanding cybersecurity capacity, and developing a sustainable talent pipeline—can the city progress from strong digital infrastructure to mature AI governance.

If these reforms advance cohesively, Hong Kong can evolve from a fast adopter into a regional leader in trustworthy, human-centred, and globally credible AI. Its unique position—bridging Mainland China's technological dynamism and global governance standards—allows it to define a distinct model of AI development in Asia: neither Singapore's centralisation nor China's industrial scale, but a governance laboratory rooted in openness, legal clarity, and institutional innovation.

In this scenario, Hong Kong can not only close its gap with Singapore but also reshape the regional model of AI leadership by 2030.

Appendices

Appendix A

Selected Factors for Comparison: Hong Kong's Service-Oriented Digital Competitiveness

From Hong Kong's (HK) perspective as a global financial and trade hub with limited hardware manufacturing or indigenous technology production (relying instead on imported tech and service-based innovation), I selected 10 factors across the three levels of the IMD World Digital Competitiveness framework (parent factors, subfactors, and indicators). The selection prioritizes metrics that highlight HK's strengths in talent attraction, regulatory efficiency, financial capital, business adaptability, and digital adoption—areas less dependent on physical manufacturing bases. This allows for meaningful comparisons with:

- Japan: Strong in hardware/R&D (e.g., robotics, patents) but challenged by regulatory rigidity and aging demographics.
- Singapore: Balanced with strong regulation and agility, but smaller scale in talent/finance compared to HK.
- Chinese Mainland (PRC): Excels in manufacturing scale and AI/hardware exports, but lags in regulatory transparency and soft skills like globalization attitudes.

The mix includes 2 parent factors (for high-level overview), 4 subfactors (for mid-level depth), and 4 indicators (for granular insights). Selections draw from the 2025 IMD framework, focusing on service/software enablers over hardware metrics (e.g., excluding robot installations or high-tech exports tied to production). Justifications emphasize how each factor underscores HK's competitive edge in a post-manufacturing, knowledge-service economy.

#	Factor	Level	Description (from IMD 2025)	Justification for Selection (HK Perspective)
1	Knowledge	Parent Factor	Encompasses talent development, education quality, and scientific output in	As a top-level factor, it captures HK's education/talent strengths (e.g., high tertiary attainment) without relying on

			digital-relevant areas (weighted aggregate of 3 subfactors).	manufacturing R&D; compares HK's "brain gain" via immigration against Japan's demographic declines and PRC's scale-driven but uneven talent distribution.
2	Future Readiness	Parent Factor	Measures adaptive capacities for digital integration (weighted aggregate of 3 subfactors on attitudes, agility, and IT use).	Highlights HK's agility in global services amid no hardware base; contrasts HK's quick policy pivots (e.g., fintech adoption) with Japan's slower adaptation and Singapore/PRC's infrastructure-heavy approaches.
3	Training & Education	Subfactor	Assesses education investment, quality (e.g., PISA scores), and digital skills training (under Knowledge).	HK ranks top-5 consistently; focuses on service-sector upskilling (not hardware engineering), justifying selection to showcase HK's elite universities as a draw for regional talent vs. Singapore's vocational focus, Japan's elite but rigid system, and PRC's mass education gaps.
4	Regulatory Framework	Subfactor	Evaluates laws on business setup, IP, immigration, and tech application (under Technology).	Emphasizes HK's business-friendly regs (e.g., low barriers) as a service economy advantage; selected to compare HK's transparency edge over PRC's state controls, Japan's bureaucracy, and Singapore's efficiency.
5	Capital	Subfactor	Gauges venture funding, financial services, and credit access for digital ventures (under Technology).	HK's finance hub status shines here (world-class banking); ideal for non-manufacturing context, contrasting HK's private capital flows with Japan's conservative lending, Singapore's state-backed funds, and PRC's scale

				but volatility.
6	Adaptive Attitudes	Subfactor	Tracks societal openness to digital change, globalization, and e-participation (under Future Readiness).	Captures HK's cosmopolitan, adaptive culture (e.g., high smartphone use); selected to highlight soft strengths in a hardware-void economy vs. Japan's insularity, Singapore's pragmatism, and PRC's top-down digital push.
7	Business Agility	Subfactor	Measures company adaptability, data use, and opportunity detection in services (under Future Readiness).	Focuses on HK's nimble SMEs in trade/finance; justifies inclusion to contrast service agility with Japan's corporate hierarchies, Singapore's startup ecosystem, and PRC's state-enterprise rigidity.
8	Starting a Business	Indicator	Distance-to-frontier score (0-100) for regulatory efficiency in business registration (under Regulatory Framework).	Granular metric of HK's ease (top-5 globally); selected as it directly ties to service startups (e.g., fintech), exposing gaps in PRC's approvals vs. strengths in Japan/Singapore's streamlined processes.
9	Smartphone Possession	Indicator	% of households with at least one smartphone (under Adaptive Attitudes).	Reflects HK's near-100% digital adoption without hardware production; chosen to compare consumer readiness in services (HK leads Asia) against Japan's high but aging penetration and PRC/Singapore's urban biases.
10	Attitudes Toward Globalization	Indicator	Executive perception of openness to global digital flows (under Adaptive Attitudes).	HK's #2 global rank underscores its trade gateway role; selected to differentiate HK's pro-global stance from Japan's protectionism, Singapore's hub model, and PRC's controlled integration.

These 10 factors provide a balanced, HK-centric lens for comparison, enabling analysis of how service/software enablers drive competitiveness in a manufacturing-light economy. They avoid hardware-biased metrics (e.g., AI patents or robot density) to focus on scalable, intangible assets.

Appendix B

IMD uses ranks for *indicator reporting*, scores for *aggregation*

Level	Data Type	What IMD publishes	Example for Hong Kong (2025)
Indicator (61 total)	Rank only (1 = best, 69 = worst)	"Immigration Laws – 55"	Hong Kong ranks 55th of 69 economies on how favorable its immigration laws are to digital talent.
Sub-factor (9 total)	Composite *score* (0 – 100) → then converted to rank	"Regulatory Framework = 12th"	Computed from several indicator values (e.g., immigration laws + privacy + IP + starting a business …).
Factor / Overall Index	Composite *score* + rank	"Technology = 3rd (2025)"	Weighted average of its three sub-factors' standardized scores.

So:

"55" = Hong Kong's position among all economies for that single criterion, not the numerical score used in averaging.

2. What lies behind each rank

IMD first collects either **hard data** (e.g., number of work visas for STEM talent) or **survey data** (executive opinions, rated 1–6).
For *survey-based* indicators such as **"Immigration Laws"**, executives in each economy rate:

"Immigration laws do not hinder the employment of foreign highly-skilled personnel."
1 = strongly disagree (very restrictive) → 6 = strongly agree (very open)

IMD averages these survey responses, standardizes them across all 69 economies, and then converts them into a **rank** (1–69).
That's why we only see the ordinal output ("55") in the public report, not the raw 1–6 score or z-score.

3. Why the numeric rank is used for country comparisons

- **Ranks** are comparable across all criteria and countries.
- **Scores** (the underlying 1–6 or 0–100 values) differ in scale and aren't disclosed publicly.
- Using ranks maintains comparability and simplifies interpretation (1 = best performer).

Hence, when you read:

Immigration Laws – 55

…it means **Hong Kong's immigration environment for attracting foreign digital talent is the 55th most favorable** among 69 economies in 2025 — not that it scored 55 points on a 0–100 scale.

Summary

Term	Meaning in IMD context
Rank	Ordinal position among 69 economies (1 = best).
Score	Standardized numerical value (0–100 or z-score) used internally to compute sub-factors and factors.
"Immigration Laws = 55"	Hong Kong ranks 55th on that indicator — a relatively restrictive environment for foreign skilled talent, but still a *rank*, not a score.

Appendix C

Hong Kong SAR – Top 5 Weakest Indicators (2021–2025)

Year	Five Weakest Indicators --- Ranking
2021	1. Educational assessment (PISA – Math) – 42 2. International experience – 37 3. Intellectual property rights – 58 4. Internet retailing – 38 5. Net flow of international students – 55
2022	1. Educational assessment (PISA – Math) – 41 2. Attitudes toward globalization – 48 3. Entrepreneurial fear of failure – 63 4. Intellectual property rights – 40 5. Net flow of international students – 53
2023	1. Smartphone possession – 53 2. Attitudes toward globalization – 49 3. Intellectual property rights – 57 4. Government cyber security capacity – 45 5. Privacy protection by law – 64
2024	1. Digital/Technological skills – 33 2. Foreign highly skilled personnel – 51 3. Management of cities – 41 4. Scientific research legislation – 35 5. Privacy protection by law – 63
2025	1. Government cyber security capacity – 44 2. Privacy protection by law – 49 3. Immigration laws – 55 4. Management of cities – 35 5. IT integration – 29

Source: IMD World Digital Competitiveness Ranking Reports 2021–2025 (official PDFs provided).

Interpretation

- Consistent Weakness Themes:

  Across all five years, Hong Kong's recurring weak points cluster around:

  - *Institutional and legal frameworks* (privacy protection, IP rights).
  - *Governmental digital capacity* (cybersecurity readiness).

    - *Human capital openness* (immigration laws, foreign talent inflow).
    - *Digital skills and globalization attitudes* among its population.

- Structural Trend:
  From 2021 to 2023, weaknesses centered on educational and talent inputs; by 2024–2025, the pattern shifted toward institutional and regulatory capacity in data privacy and cyber security governance.

- Policy Implication:
  While Hong Kong's overall ranking remains within the global top 10, these chronic weak points indicate areas where *regulatory modernization, cross-border talent policy, and digital governance* reforms could yield the greatest marginal gains.

Appendix D

Overview of the Frameworks：IMD World Digital Competitiveness framework and IMF AI preparedness framework

The IMD World Digital Competitiveness Ranking (WDCR), published annually by the International Institute for Management Development (IMD) since 2017, assesses the ability of 67–69 economies to adopt and explore digital technologies for transformation across business, government, and society. It emphasizes broad digital transformation enablers like infrastructure, regulation, and societal readiness. The IMF AI Preparedness Index (AIPI), launched in 2024 by the International Monetary Fund (IMF), evaluates AI-specific readiness in 174 economies. It focuses on harnessing AI's productivity gains while mitigating risks like job displacement and inequality, using a 0–1 score (higher = better prepared).Both frameworks promote economic resilience through technology but differ in scope, depth, and application. WDCR is broader (general digital tech) and enterprise/society-oriented, while AIPI is narrower (AI-focused) and policy/risk-mitigation-oriented.

Key Differences: the frameworks across core dimensions:

Aspect	IMD World Digital Competitiveness Ranking (WDCR)	IMF AI Preparedness Index (AIPI)
Primary Focus	Broad digital competitiveness: Adoption of digital technologies (e.g., AI, blockchain, robotics) for economic transformation at organizational, institutional, and structural levels.	AI-specific preparedness: Readiness to integrate AI while addressing risks (e.g., job impacts, ethics); emphasizes equitable benefits across economies.
Coverage	67–69 economies (mostly advanced and emerging; e.g., excludes many low-income countries).	174 economies (global, including low-income; broader representation for developing nations).
Structure/Pillars	3 parent factors, each with 3 subfactors (9 total), and 50+ indicators: - Knowledge: Talent, Training & Education, Scientific Concentration. - Technology:	4 pillars, each with components and indicators (aggregated via Principal Component Analysis): - Digital Infrastructure: Fiber-optic broadband, 5G, smartphones, electricity access. -

	Regulatory Framework, Capital, Technological Framework. - Future Readiness: Adaptive Attitudes, Business Agility, IT Integration.	Human Capital & Labor Market Policies: Education quality, STEM enrollment, reskilling programs, social safety nets. - Innovation & Economic Integration: R&D spending, AI patents, venture capital, trade openness. - Regulation & Ethics: AI laws, data privacy, cybersecurity, ethical guidelines.
Methodology	Mix of hard data (e.g., internet speed, PISA scores) and soft data (executive surveys on agility). Aggregated into ranks (1 = best). Equal weighting across factors.	Primarily hard data (e.g., % mobile transactions, public e-services). Normalized 0–1 scores; uses PCA for aggregation. Equal weighting across pillars.
Data Sources	IMD surveys, World Bank, UNESCO, ITU, national stats; updated annually with time-series integration from IMD's other rankings (e.g., Talent Ranking).	IMF datasets, World Bank, UNESCO, WIPO; static as of 2023 baseline, with dashboard for updates.
Output	Annual rankings and scores; identifies strengths/weaknesses for policy benchmarking (e.g., Singapore #1 in 2024 for agility).	0–1 index scores with dashboard; highlights divergences (e.g., advanced economies score 0.6–0.8; low-income ~0.3).
Strengths	Comprehensive on business/societal adaptation; forward-looking (e.g., attitudes toward globalization).	Inclusive of global south; AI-risk integrated (e.g., labor policies for 33% job exposure in advanced economies).
Limitations	Less emphasis on AI ethics/risks; survey bias in soft data.	Narrower (AI-only); less on business agility or scientific concentration.
Use Cases	Business strategy, talent attraction, regulatory reform (e.g., improving IT integration).	Macro policy: Fiscal tools for AI equity, innovation funding, ethical regulations.

Detailed Comparison

- Scope and Granularity: WDCR's three factors provide a holistic view of digital ecosystems, with subfactors like "Business Agility" capturing real-time adaptability (e.g., via surveys on data-driven decisions). AIPI's four pillars are more AI-tailored, e.g., "Innovation" includes AI-specific metrics like private AI investments, absent in WDCR.
- AI Overlap and Gaps: Both cover infrastructure and talent, but AIPI uniquely stresses ethics (e.g., privacy laws) and labor resilience (e.g., unemployment benefits), reflecting AI's disruptive potential. WDCR touches AI indirectly via "Technological Framework" (e.g., mobile app sophistication) but not risks.
- Global Equity: AIPI's wider coverage reveals divides (e.g., U.S. at 0.75 vs. many African nations <0.4), promoting inclusive policies. WDCR focuses on competitive leaders, potentially overlooking low-income challenges.
- Evolution: WDCR evolves annually (e.g., 2025 edition incorporates emerging tech like quantum computing). AIPI is newer, with potential for expansions like worker transition models.

In summary, WDCR is a versatile tool for digital benchmarking, while AIPI is a targeted diagnostic for AI governance. Economies like Singapore excel in both, but low-income countries may prioritize AIPI for foundational gaps.

Appendix E

Table 5: Current HK AI Applications / Pilots with Departments and Details

Application / Pilot	Departments Involved	Details
Epidemiological & public-health modelling	Department of Health; Hospital Authority; universities and research centres	Used during COVID-19 and extended to pandemic preparedness to model disease spread and simulate intervention outcomes.
Flood-risk forecasting for drainage interventions	Drainage Services Department (DSD)	AI-enabled flood forecasting and 'M³' digital twin platforms used to simulate heavy-rainfall impacts and guide drainage system upgrades.
Demand forecasting for public services	Census and Statistics Department; relevant bureaux (e.g., Transport & Housing, Education)	AI applied to anticipate service needs such as transport demand, school placements, and healthcare workloads.
Generative AI drafting/summarisation pilots	Digital Policy Office (DPO); Hong Kong Generative AI R&D Centre (HKGAI)	Pilots launched in 2024 to support document drafting, summarisation, and translation across bureaux.
Judiciary guidance for research/drafting	Hong Kong Judiciary	July 2024 guidelines allow judges and staff to use generative AI for legal research and drafting, under strict accuracy and confidentiality protocols.
Police "iQ" internal LLM chatbot	Hong Kong Police Force (Information Systems Wing / E-Police Division)	Provides semantic search and summarisation of Police General Orders and handbooks,

		enhancing staff efficiency.
Smart Lab AI+ solution catalogue	Digital Policy Office (Smart Government Innovation Lab)	Centralised platform to showcase and trial AI tools for departmental adoption, including back-office automation.
FEHD rodent detection system	Food and Environmental Hygiene Department (FEHD); University of Hong Kong	Territory-wide Rodent Activity Survey (RAS) uses AI-enabled thermal imaging cameras to monitor rodent presence at over 100 sites per district, guiding pest control strategies.
DSD predictive maintenance & flood forecasting	Drainage Services Department (DSD)	Use of AI and IoT sensors for predictive maintenance of sewage/drainage systems and real-time flood risk forecasting.
Traffic & Autonomous Vehicle (AV) trials	Transport Department; Transport and Logistics Bureau	Pilot trials such as Baidu Apollo AVs licensed for testing in North Lantau, with AI controlling autonomous navigation and traffic integration.
Smart hygiene sensing	Food and Environmental Hygiene Department (FEHD)	AI-enabled detection of overflowing bins and rodent activity via sensors and CCTV, feeding real-time alerts to FEHD staff.
Public-space anomaly detection	Electrical and Mechanical Services Department (EMSD); FEHD	AI surveillance integrated with IoT to detect abnormal events (e.g., equipment faults, waste overflow).
Citywide chat/voice	Digital Policy Office	Generative AI assistants

portals	(DPO); Smart Government Innovation Lab	deployed on government service portals and hotlines to handle routine citizen inquiries (permits, applications).

Appendix F

Cross-year table of **AI-readiness rankings** (interpreted as IMD WDCR's **Future Readiness** factor rank; lower is better) for the four economies, 2021–2025:

Economy	2021	2022	2023	2024	2025
Hong Kong SAR	10	18	17	15	10
Singapore	11	10	10	1	6
Japan	27	28	32	38	39
Chinese Mainland	53	56	60	49	46

Appendix G

Table of **IMD World Digital Competitiveness – Future Readiness sub-factor ranks** (1 = best) for the four economies, 2021–2025.

Economy	Sub-factor	2021	2022	2023	2024	2025
Hong Kong SAR	AA	3	9	5	3	1
	BA	9	11	16	12	7
	ITi	17	45	47	36	29
Singapore	AA	11	17	13	1	11
	BA	12	9	14	1	11
	ITi	7	8	11	1	6
Japan	AA	18	20	22	37	36
	BA	53	62	56	58	60
	ITi	23	18	16	17	17
Chinese Mainland	AA	19	22	20	19	22
	BA	3	3	4	8	6
	ITi	32	32	32	26	35

Notes for interpretation

- Rankings are **within the Future Readiness pillar** (not overall digital competitiveness). Lower numbers are better.
- The IMD 2025 profiles present these **five-year time-series** in a single table per economy, ensuring consistency across years.
- Sub-factors shown: **Adaptive Attitudes (AA)**, **Business Agility (BA)**, **IT Integration (ITi)**.

Appendix H

How AI-Readiness Is Formed

The IMD World Digital Competitiveness Framework provides a structured and comprehensive method for evaluating how economies prepare for and harness digital transformation. Within this framework, "AI Readiness" is not treated as an isolated measure, but as the combined outcome of three major components—Knowledge, Technology, and Future Readiness. Together, these pillars capture the essential human, institutional, and technological conditions that determine how effectively a country can adopt, develop, and integrate artificial intelligence into its economy and society.

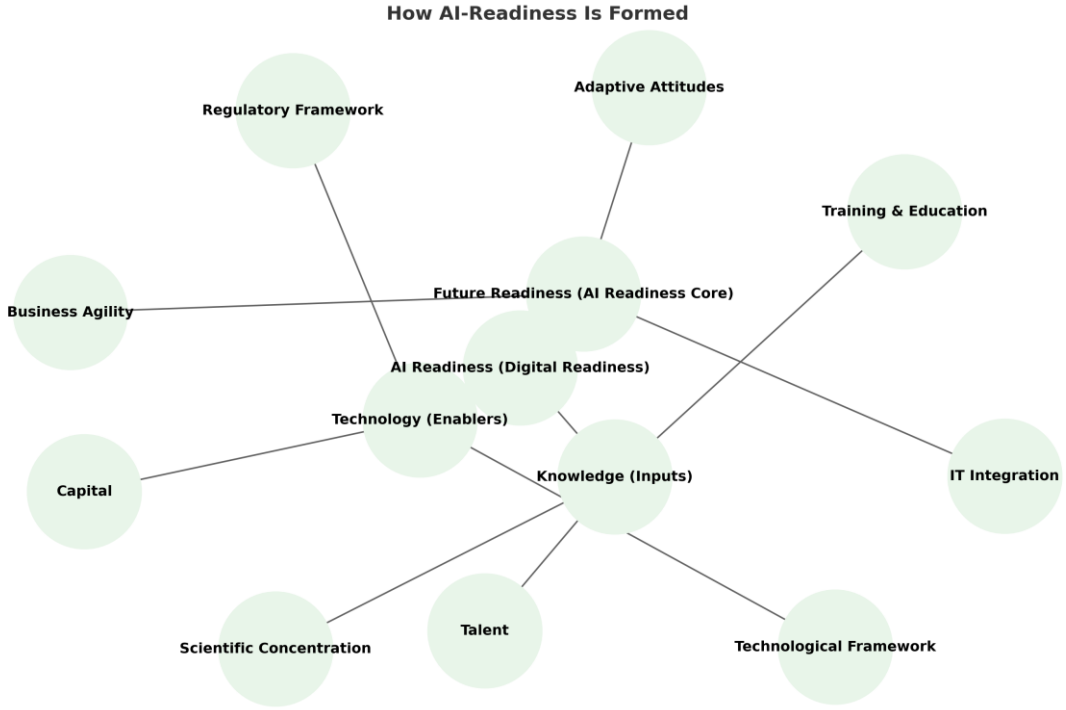
The first pillar, Knowledge, represents the input capacity that builds the foundation for digital innovation. It measures how well a country can cultivate the skills and expertise required to understand and create new technologies. This factor includes three sub-components: Talent, Training & Education, and Scientific Concentration. Talent refers to the availability of digitally skilled professionals, while Training & Education assesses the country's investment in continuous learning and digital upskilling. Scientific Concentration evaluates research capabilities, R&D expenditure, and technological output such as AI patents or academic publications. Together, these metrics describe how effectively a country is nurturing the human capital that fuels technological discovery and innovation.

The second pillar, Technology, represents the enabling environment that allows digital and AI systems to flourish. It focuses on the availability of resources, policy frameworks, and infrastructure that sustain digital development. Its three sub-factors are the Regulatory Framework, Capital, and Technological Framework. The Regulatory Framework assesses how well governments create supportive laws and policies, including data protection, AI ethics, and cybersecurity regulations. Capital measures financial readiness through venture funding, private investment, and market support for AI-driven innovation. Finally, the
Technological Framework evaluates ICT infrastructure, broadband coverage, and cloud connectivity, which together determine the economy's ability to deploy and

scale AI solutions.

The third and most critical pillar, Future Readiness, represents the actual level of AI adoption and integration within society, businesses, and government institutions. It serves as the output layer of digital transformation and directly mirrors how AI readiness manifests in practice. This pillar includes Adaptive Attitudes, Business Agility, and IT Integration. Adaptive Attitudes measure public openness to new technologies, digital literacy, and trust in AI-driven tools. Business Agility reflects how enterprises innovate, pivot, and incorporate AI into operations. IT Integration assesses the technical capacity of public and private sectors to embed AI and digital systems into everyday processes. This pillar captures the behavioral and operational aspects of AI adoption, linking human adaptability with organizational innovation. These three pillars are interconnected and mutually reinforcing. Knowledge builds the skills and innovation base; Technology
provides the regulatory and infrastructural support; and Future Readiness demonstrates real-world adaptation to AI. Together, they form the complete picture of a nation's digital strength. In simple terms: AI Readiness = Future Readiness + Support from Knowledge and Technology.

The logic behind this formula reflects a holistic understanding of digital competitiveness: it is not enough to possess advanced technology or a skilled workforce alone—true readiness emerges only when people, systems, and organizations collectively learn, adapt, and integrate AI into their development strategies. This alignment of learning, infrastructure, and application defines the IMD's vision of how economies achieve sustainable digital transformation.


How AI-Readiness Is Formed
Regulatory Framework
Adaptive Attitudes
Training & Education
Business Agility
Future Readiness (AI Readiness Core)
AI Readiness (Digital Readiness)
Technology (Enablers)
Capital
Knowledge (Inputs)
IT Integration
Scientific Concentration
Talent
Technological Framework

Appendix I

In the **IMD World Digital Competitiveness Ranking (WDCR)** methodology, *Future Readiness* measures an economy's preparedness to adapt to and exploit digital transformation. It differentiates contributions from **government**, **business**, and **society** through three structured **sub-factors** — each representing one of these societal pillars:

Sub-factor	Main Contributor	Conceptual Focus	Representative Indicators
Adaptive Attitudes	Society / individuals	Reflects citizens' openness to technology, digital literacy, and participation in e-governance. It captures social flexibility and willingness to embrace digital change.	e-Participation index, internet users, attitudes toward digitalization, use of big data and analytics, digital risk awareness, and privacy protection by law WDCR_Report_2025 .
Business Agility	Private sector / enterprises	Measures how dynamic and innovative the business environment is in adopting new technologies, integrating AI, and transforming models.	Agility of companies, use of AI and big data, venture capital availability, knowledge transfer, entrepreneurial fear of failure, and adaptability of corporate management practices Digital-Ranking-IMD-2022 .
IT Integration	Government / institutions	Gauges institutional support and digital infrastructure integration across public administration and industry. It reflects policy	Government cybersecurity capacity, AI policies passed into law, e-government services, and IT/media stock-market capitalization.

		coherence, cybersecurity, and digital governance quality.	

Structural Breakdown of WDCR Methodology

The IMD methodology defines **nine sub-factors** (three for each major factor: Knowledge, Technology, and Future Readiness). Each sub-factor has equal weight (≈11.1% of total), combining **hard data (2/3)** and **executive survey data (1/3)**

Within *Future Readiness*:

- **Adaptive Attitudes** → measures societal flexibility and human capital responsiveness.
- **Business Agility** → measures firms' innovation and responsiveness to market change.
- **IT Integration** → measures governmental and institutional digital implementation capacity.

Analytical Interpretation

Thus, when interpreting "AI-readiness" or *Future Readiness* rankings:

- **Governments** influence readiness through digital policy, e-governance, and cybersecurity.
- **Businesses** drive readiness via agility, innovation culture, and technological adoption.
- **Society** contributes through digital literacy, openness to change, and participatory engagement online.

Together, these sub-factors form a balanced triad—**institutional capacity (government)**, **entrepreneurial dynamism (business)**, and **societal adaptability (citizens)**—that determines each economy's AI-readiness level within IMD's digital competitiveness framework.

Appendix J

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Appendix K

Selected Economies of World Digital Competitiveness Overall Ranking (2021–2025)

(Smaller numbers indicate better performance)

Year	Singapore	Hong Kong SAR	Chinese Mainland	Japan
2021	5	2	15	28
2022	4	9	17	29
2023	3	10	19	32
2024	1	7	14	31
2025	3	4	12	30

Sources: Complied from reports of IMD World Digital Competitiveness Ranking (2021-2025)

AI-Readiness (Future Readiness) Rankings of Selected Economies, 2021–2025 (IMD WDCR)

Year	Singapore	Hong Kong SAR	Chinese Mainland	Japan
2021	11	10	17	27
2022	10	18	15	28
2023	10	17	13	32
2024	1	15	14	38
2025	6	10	18	39

Sources: Complied from reports of IMD World Digital Competitiveness Ranking (2021-2025)

Adaptive Attitudes (AA) Rankings, 2021–2025

Year	Singapore	Hong Kong	Chinese Mainland	Japan
2021	11	3	19	18
2022	17	9	22	20
2023	13	5	20	22
2024	1	3	19	18
2025	11	1	22	36

Sources: Complied from reports of IMD World Digital Competitiveness Ranking (2021-2025)

Business Agility (BA) Rankings, 2021–2025

Year	Singapore	Hong Kong SAR	China (Mainland)	Japan
2021	12	9	3	53
2022	9	11	3	62
2023	14	16	4	56
2024	1	12	8	58
2025	11	7	6	60

Sources: Complied from reports of IMD World Digital Competitiveness Ranking (2021-2025)

IT Integration (Iti) Trend (2021–2025)

Year	Singapore	Hong Kong SAR	China (Mainland)	Japan
2021	7	17	32	23
2022	8	45	32	18
2023	11	47	32	16
2024	1	36	26	17
2025	6	29	35	17

Sources: Complied from reports of IMD World Digital Competitiveness Ranking (2021-2025)

Appendix L

Comparison between Hong Kong and Singapore in AI regime

Table 1 — National AI Strategy, Governance & Institutional Strength

Items with "*" are subjective 1–10 scores (10 = most complete), not official indicators.

Indicator	Hong Kong	Singapore	Brief Comments
Whether there is a national AI strategy	No independent "National AI Strategy"; the 2022 "Innovation and Technology Development Blueprint" lists AI as a key industry and application direction, but it is part of the overall innovation and technology blueprint and has not formed a complete AI national policy.	Has a clear national AI strategy: 2019 "National AI Strategy (NAS)" + 2023 "National AI Strategy 2.0", setting out the AI vision and action roadmap to 2030.	Singapore is clearly leading at the strategic level; Hong Kong still belongs to "mentioned in the blueprint, but not an independent AI national policy".
AI leading/coordinating institution	Digital Policy Office (DPO) (inheriting from former OGCIO) is responsible for digital government, data governance, and "Ethical AI Framework"; additionally, there are industry	Under the Prime Minister's Office, the Smart Nation & Digital Government Office (SNDGO) coordinates, forming a more centralized and	Hong Kong: Multiple regulators and departments pieced together; Singapore: Centralized coordination at PMO level.

	regulators such as PCPD, HKMA, SFC, IA, MPFA, OFCA, each issuing guidelines on AI/data—belonging to a multi-headed, matrix-style regulation.	clear digital and AI governance structure with institutions like IMDA.	
AI/data regulation completeness*	About 3/10 (subjective score): Has general frameworks like PDPO and "Cybersecurity Law"; 2023 DPO "Ethical AI Framework" and 2024 PCPD "Artificial Intelligence: Model Personal Data Protection Framework", but no dedicated AI law, no provisions for automated decision-making rights, and PDPO major revision not completed.	About 8/10 (subjective score): Has PDPA (including cross-border data rules), AI Verify testing framework, AI Verify Foundation, aligned with NIST AI RMF and international frameworks, forming a more complete combination of "soft law + technical testing + industry practices".	In terms of institutionalization of regulations and testing tools, SG is clearly higher than HK.
Government AI usage prevalence	Mature e-government applications (e.g.,	GovTech leads in implementing	Both places are using AI, but Singapore's

	e-forms, smart city projects), individual departments piloting generative AI, image interpretation, etc.; but has not yet formed a "whole-government AI platform + unified governance", mostly scattered pilots.	AI, data analysis, and chatbots (Ask Jamie, VICA, etc.), and launches GovTech AI Stack and multiple whole-government platforms, with almost all departments having digitalization and AI applications.	"integrated platform + unified tech stack" is more mature.
AI safety/testing framework	Has DPO Ethical AI Framework and PCPD AI Model Privacy Framework, but no national-level technical testing tools or certification system like AI Verify; compliance relies more on multiple regulatory guidelines.	AI Verify, GenAI Testing Starter Kit, AI Verify Foundation, etc., provide specific test cases, risk controls, and international mapping (e.g., NIST AI RMF), regarded as a global leading government-led AI testing framework.	In terms of "verifiable AI safety/governance", SG is ahead.

Table 2 — Compute (Computing Power), Infrastructure & Data Governance

Indicator	Hong Kong	Singapore	Comments
National-level supercomputer/ AI supercomputing center	Cyberport AI Supercomputing Centre (AISC): Government-invested and established, launched in 2024, initially providing about 1,300 PFLOPS AI precision computing power, planned to upgrade to about 3,000 PFLOPS by 2026, with mid-to-long-term further expansion concepts. Although it is a public strategic infrastructure, its positioning is still biased towards "innovation and technology/commercial computing services", not yet operating under the name of "national research supercomputing center" or listed in TOP500.	National Supercomputing Centre (NSCC): Operates national-level supercomputers like ASPIRE 2A / 2A+, official description states ASPIRE 2A provides up to about 10 PFLOPS raw computing power, using HPE Cray EX architecture and listed in TOP500. In 2024, the government invested another S$270m to expand next-generation supercomputers and talent.	Both places have high-performance computing, but SG's supercomputing system is clearer in "national research" positioning and international ranking.
AI training computing power scale	Mainly based on AISC, plus local/cross-border cloud GPUs; official goal is to enable research and industry	NSCC supercomputer (10+ PFLOPS HPC) + commercial cloud GPUs + telecom industry GPU-as-a-	Different computing forms: HK leans towards a single AI center + cloud,

	to share a 1,300 → 3,000 PFLOPS AI computing pool, with subsidy programs to cover usage costs.	service, forming a "national research + commercial cloud" dual-layer architecture to support AI R&D and government/enterprise applications.	SG is national supercomputer + multi-layer cloud ecosystem.
City-scale digital twin	No official announcement of a "city-wide 3D digital twin" project, mostly individual regions or departments' 3D planning and smart city pilots.	Virtual Singapore / Singapore Digital Twin: Builds a full-island 3D digital twin and simulation platform, supporting applications in urban planning, transportation, energy, etc., a typical city-scale digital twin case.	In terms of digital twin and smart city integration, SG is significantly ahead.
Cross-border data/data protection system	Centered on the "Personal Data (Privacy) Ordinance" PDPO; with the mainland, participates in Guangdong-Hong Kong-Macao Greater Bay Area data cross-border flow pilots, and supports financial and enterprise data sharing under compliance frameworks through the Commercial Data Interchange platform CDI/CDEG. For AI, cross-border data is	PDPA + clear cross-border transfer rules (e.g., adequacy list, contract clauses, etc.), combined with IMDA's Trusted Data Sharing Framework, Open Data policy, and industry norms, forming a more complete data governance and cross-border transmission rules.	Both places allow cross-border data transmission, but SG's "single main law + supporting framework" offers higher predictability for enterprises.

	still guided by multiple regulators (PCPD, HKMA, etc.), with an overall fragmented framework.		
Open data and e-government performance	Has data.gov.hk, official claim in 2024 covers 19 categories, 110+ institutional datasets, continuously expanding. In UN E-Government Survey, it is in the high-score group, but lower than Singapore.	After 2014 Smart Nation, treats e-government/open data as national strategic pillars; ranked 3rd in UN 2024 E-Government Development Index, among global top.	Overall maturity of e-government and open data: SG > HK, but HK has shown clear catch-up in recent years.

Table 3 — Talent & Human Capital

Indicator	Hong Kong	Singapore	Comments
Overall R&D manpower	In 2023, about 39,710 full-time equivalents (FTE) in research personnel, up 3.4% from 2022. (Note: Headcount is ~43,403; table uses FTE.)	In 2022, R&D manpower about 59,752 (headcount), spanning public research institutions and enterprise R&D departments.	Measured by R&D personnel, Singapore's overall research manpower scale is larger than Hong Kong's.
AI/data specialist scale (rough)	No unified official statistics, industry estimates at tens of thousands level, concentrated in finance, telecom, internet tech, and universities/public research institutions; talent supply and training generally seen as a mid-to-long-term bottleneck.	Centered on AI Singapore, GovTech, universities, and enterprises, systematically cultivates AI engineers through programs like AI Apprenticeship Programme (AIAP); as of 2024–25, AIAP has trained over 400–500 local AI engineers, and is still expanding.	SG is clearly more mature in "organized AI talent cultivation pipelines".
AI/ML engineer training programs	No national-level "AI apprenticeship program"; mainly relies on university courses, Vocational Training Council, science parks/Cyberport, and individual enterprises' short courses and bootcamps.	AI Apprenticeship Programme (AIAP) is a national-level deep skills program, training local AI engineers since 2018, 9 or 6 months full-time, combined with 100E enterprise projects; expanded to "AIAP Industry" from 2025, adding 300 slots in the next two years.	This is the most obvious difference between the two places in "systematic AI engineer training".
STEM	STEM graduate	R&D spending	In "sustained

workforce and education	proportion is not low, but government spending on R&D and education as % of GDP is relatively low (GERD about 1.11% GDP), affecting long-term talent supply.	maintained long-term at about 2–2.2% GDP, and concentrates resources on research and talent through plans like RIE2025.	research investment + talent pipelines", SG has structural advantages.

Table 4 — R&D, Funding & Industry Development Amounts based on the latest available official data; AI market scale partly from industry research summaries, definitions may vary across institutions.

Indicator	Hong Kong	Singapore	Comments
Overall R&D expenditure (GERD)	In 2023, local total R&D expenditure about HKD 33,006 million (about 330 billion HKD), accounting for about 1.11% of GDP.	Multiple sources show Singapore R&D spending at about 2–2.2% GDP (e.g., 2.22% in 2020), amounting to over ten billion SGD; this proportion maintained at about 2% in recent years.	In "R&D / GDP" proportion, Singapore's research investment is about twice that of Hong Kong.
Public/national-level AI/digital R&D investment	In recent years, launched multiple innovation and technology subsidies and funds, including InnoHK, re-industrialization and technology training programs, Innovation and Technology Venture Fund, 30 billion "Artificial Intelligence Subsidy Scheme", AI supercomputing center, etc., with cumulative investment reaching hundreds of billions HKD, but no single official statistic for "AI-specific investment total". (Note: AI	Through RIE2025 (about S$25bn), Smart Nation plan, NAS 2.0 supporting measures, and multiple AI/digital transformation plans, continuously provides long-term, stable public funds for AI and digitalization, with clear phased goals.	Both places are "pouring money", but SG's investment is placed under a clearer national AI/research framework.

	subsidy is HK$3b, not 30b; total I&T funds exceed hundreds of billions.)		
AI industry/market scale (industry estimates)	Different market reports estimate Hong Kong AI-related revenue (especially generative AI, AI services) at tens of billions HKD to about 1 billion USD level, mainly concentrated in finance, logistics, advertising, and SaaS applications.	Data from Statista etc. show Singapore AI market scale to 2025 at tens of billions USD level, far higher than local; growth rate also faster. (Note: ~US$0.765b in 2025; "tens of billions" may overestimate, but growth is faster.)	Overall, Singapore's AI industry "total pie" is several times larger than Hong Kong's, and growing faster.
AI Startup number and nature	Locally about hundreds of AI/data tech-related companies, many application-oriented (FinTech, RegTech, marketing, logistics optimization, etc.), a considerable portion relying on external cloud computing and models.	Singapore gathers a large number of regional AI startups; besides application-oriented, many around infrastructure, MLOps, model services, plus multinational enterprises setting up regional AI centers in Singapore.	Startup numbers similar or HK slightly more, but SG has higher proportion in "deep tech and foundational layers".

Table 5 — Model Ecosystem (LLMs & Foundation Models)

Indicator	Hong Kong	Singapore	Notes
Local/government-led large language models (LLM)	No visible launch by SAR government or city-wide research alliance of an open-source LLM with clear "Hong Kong language + regulatory context" positioning and widely known in international communities; currently mostly using international models (OpenAI, Anthropic, etc.) and mainland models (Tongyi Qianwen, Wenxin Yiyan, etc.). (Note: HKGAI V1 launched in 2025 by gov-supported center, but not fully "government-led" or widely known yet.)	SEA-LION: Open-source multilingual LLM family led by AI Singapore, supporting 11 Southeast Asian languages, open-sourced multiple 3B–7B model versions, achieving SOTA levels on multiple benchmarks for SEA languages. MERaLiON: Speech and multimodal foundation model (SpeechEncoder, AudioLLM, etc.), serving Singapore and regional speech scenarios.	SG already has clearly positioned national-level/regional open-source model families; HK currently mainly "using others' models".
Whether the model is open-source/commercially usable	Hong Kong has no "local official LLM" to discuss open-source	SEA-LION open-sourced on GitHub/Hugging Face, using	In "local open-source LLM ecosystem", SG is leading.

	status; enterprises mostly rely on open-source international models (Llama, Mistral, etc.) or commercial APIs.	permissive licenses like MIT, available for commercial use; multiple MERaLiON models also public on Hugging Face.	
Dominant market model supplies	International models (OpenAI, Anthropic, etc.), Chinese large models (Tongyi, Wenxin, etc.), and a few local startup model providers.	International commercial models + local SEA-LION, MERaLiON, and collaborations with Alibaba Qwen etc. to build SEA version SEA-LION v4.	SG has actual landing cases in "combining local models with international clouds".

Table 6 — Digital Competitiveness & Adoption Metrics (Based on IMD/Statistics)Only list values that can be directly verified from public data; sub-indicators (e.g., Business Agility) only give relative performance, avoid misquoting specific rankings.

Indicator	Hong Kong	Singapore	Explanation
IMD World Digital Competitiveness Ranking 2024 overall ranking	7th place, up 3 places from 2023.	1st place, consistently in global forefront for multiple years.	2024: SG = #1, HK = #7.
IMD World Digital Competitiveness Ranking 2025 overall ranking	4th place, up another 3 places.	3rd place, only behind Switzerland and the US.	Overall digital competitiveness: SG slightly higher than HK, but HK has progressed quickly in the last two years.
Business Agility (business/commercial agility, IMD sub-indicator, relative performance)	In IMD report, mid-to-lower tier, consistent with survey items on enterprise transformation speed, entrepreneurial vitality, etc.; one of HK's relative weaknesses in digital competitiveness.	In Business Agility indicators, often in global forefront, reflecting Singapore enterprises' greater agility in new business models, digital transformation, and entrepreneurial environment.	Specific rankings depend on your IMD original table, but directionally "SG clearly better than HK" is a stable conclusion.
IT Integration (IT integration level, IMD sub-indicator, relative performance)	Enterprise and government system integration at	In IT Integration related indicators, SG long-term in	Direction same as above: SG > HK.

	mid-upper level, but still significant room for improvement in big data applications, cross-department data interoperability, etc.; IMD evaluates HK as having institutional frictions in "data usage and cybersecurity governance".	forefront, reflecting widespread adoption of cloud, platformization, and API-based integration by enterprises and government.	
Smartphone penetration rate (residents/households)	Government statistics show about 97.1% smartphone ownership among population aged 15 and above in 2022, near full penetration; 2024 communications service survey also shows smartphones as main internet access tool.	Data from Statista etc. show Singapore smartphone penetration at about 97% in 2023, similarly near universal; multiple reports list Singapore as one of global highest penetration countries.	Both places at "extremely high penetration", little difference.
Tablet penetration rate	Hong Kong and Singapore tablet ownership data, due to differences in sources and definitions	Same as left.	No longer give specific percentages to avoid errors from different statistical

	(household or individual basis), public data not fully consistent; most surveys show both at about 40–60% range, Hong Kong possibly slightly higher, but little difference.		calibers.
Attitudes to Globalisation (attitude towards globalization, IMD sub-indicator)	Based on your WDCR 2025 data, Hong Kong's ranking in this indicator slightly higher than Singapore's; IMD public summary only notes both as economies open to globalization.	Same as above.	Since IMD does not provide item-by-item rankings for free, here only confirm: both high scores; your point that "HK ranking higher than SG" is reasonable, so no longer write "Hong Kong lower".

Table 7 — Government Adoption & Public Services AI

Indicator	Hong Kong	Singapore	Comments
Government AI integrated platform	No externally claimed "whole-government AI Stack"; departments separately adopt cloud services, RPA, machine learning, and generative AI, and formulate internal policies under DPO/PCPD guidelines.	GovTech AI Stack: Shared AI platform and services (e.g., NLP, chatbots, document summarization) provided by GovTech/SNDGO, for reuse by government departments.	SG's "shared AI platform" is already formed; HK mainly department self-built.
Whole-government chat assistant	Piloting HKChat etc. local language chat assistants, mainly for answering government service queries; still in early stage.	Long-operating Ask Jamie (FAQ/chatbot) and multiple VICA etc. digital assistants, used in different departments and channels (websites, Apps, kiosks).	In "maturity + coverage", SG leading; HK just starting.
AI applications in public medical services	Has image diagnosis, intelligent triage, epidemic analysis, and electronic health records etc. AI applications, but mostly projects by Hospital Authority/individual hospitals with universities, scale gradually expanding.	NSCC collaborates with SingHealth etc. to establish medical AI research platforms (e.g., Prescience), and widely uses AI in public medical systems for image analysis, scheduling optimization, and prediction.	Both have medical AI, but SG more complete in "relying on national supercomputer + whole system".
Smart city integration level	Developing multiple smart city projects (smart lampposts, traffic, environmental monitoring, etc.), but overall integration mainly individual plans/regions.	Under Smart Nation strategy, forms highly integrated smart city framework with Virtual Singapore / Digital Twin + IoT + national digital identity etc.	Overall "city-wide integration" level, SG > HK.

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