

Research - Data Center Series - 3/6

A Global Panorama II: Spotlight on the Southeast Asia Market
- Singapore & Indonesia

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AUTHOR:
SYAKIRA FILDZA

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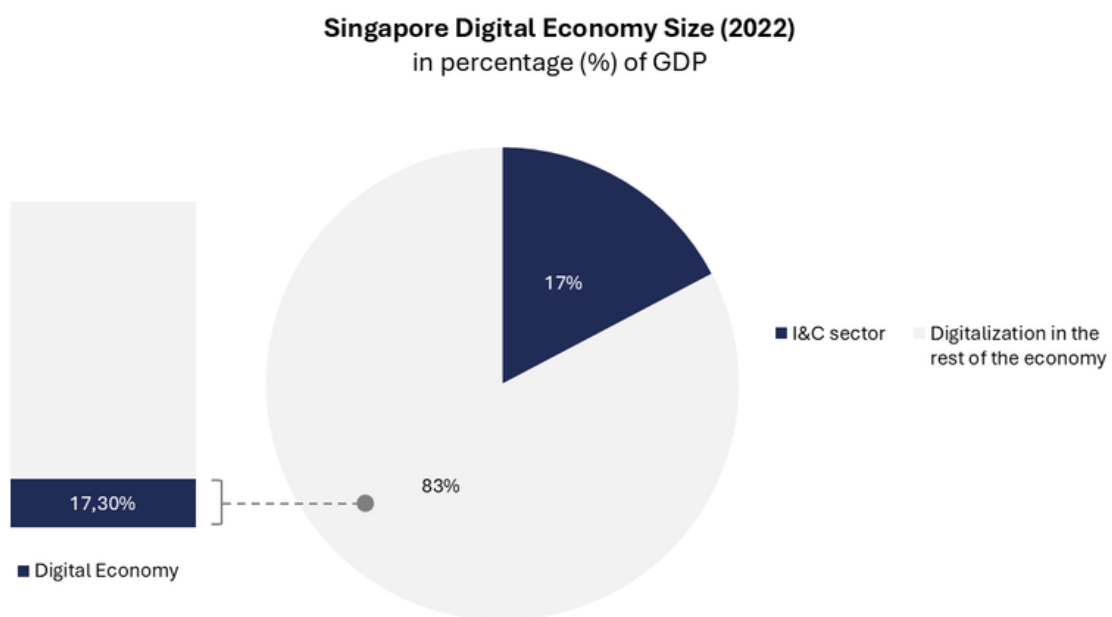


Overview - Singapore

Singapore's Digital Economy (DE) continues to play a pivotal role in the nation's growth. In 2023, the value-added (VA) of Singapore's DE reached **\$113.2 billion** in nominal terms, accounting for **17.7%** of the country's GDP. Similar to 2022, the **Information & Communications (I&C)** sector contributed approximately one-third of this value, while the remaining two-thirds came from the digitalization of various industries across the economy.

Digital transformation is increasingly becoming ingrained in Singapore's businesses. In 2023, **94.6%** of companies had adopted at least one digital solution, such as **Cybersecurity, Cloud, E-payment, E-commerce, Data Analytics, and Artificial Intelligence (AI)**. This represents a 0.5 percentage point increase from 2022. The intensity of digital adoption also showed consistent growth, with the **average number of digital solutions** implemented per firm rising from 1.9 in 2022 to 2.0 in 2023.

The uptake of advanced digital solutions like Cloud Computing, Data Analytics, and AI has notably increased, especially among **larger firms**. In 2023, the majority of **non-SME** enterprises had adopted Cloud Computing and Data Analytics, while **40%** had integrated AI into their operations.



Sources: ITNews

Singapore remains dedicated to leveraging AI as a fundamental component of its Smart Nation initiative. The country is experiencing a rise in AI adoption, with 44% of larger enterprises utilizing AI in 2023, more than double the 16.7% recorded in 2018. Although SMEs have seen slower adoption rates, their AI usage has increased modestly, from 3.5% in 2018 to 4.2% in 2023. This growing dependence on digital technologies is a significant factor driving Singapore's data center sector.

Data Center Market

As a well-established leader in Southeast Asia's data center market, Singapore is set for ongoing growth. The market is projected to increase from USD 1,296.79 million in 2023 to USD 3,039.16 million by 2032, representing a compound annual growth rate (CAGR) of 9.53% from 2024 to 2032. Key global players, including Google, Microsoft, and Amazon Web Services, along with notable local operators such as SingTel and Keppel Data Centres dominate the sector, particularly through their investments in hyperscale and colocation facilities.

Strategic Advantages

Singapore's strategic location and advanced infrastructure position it as a crucial hub for data services in the Asia-Pacific region. Its key advantages include:

- **Government Support:** Initiatives such as the Infocomm Media Development Authority's (IMDA) Data Center Development Blueprint focuses on energy efficiency, land optimization, and industry collaboration, fostering sustainable growth within the data center sector.
- **Cybersecurity Leadership:** Singapore's rigorous cybersecurity framework has built trust among data center operators and global corporations, establishing the nation as a secure environment for data operations.
- **Submarine Cable & Global Connectivity:** Singapore is linked to over 20 submarine cable systems, providing high-capacity, low-latency connections that facilitate seamless global data transfer. Given the Asia-Pacific region's substantial share of global data traffic, Singapore's role in managing and distributing this data is essential.
- **High Domestic Internet Penetration:** With internet penetration exceeding 90%, Singapore benefits from strong local demand for data-intensive services, further solidifying its position as a leader in the digital economy.

Barriers to Entry

Despite its strong positioning, Singapore's data center sector faces several challenges:

1. **Land Scarcity:** Singapore's limited land area presents significant challenges in securing space for new data centers. This scarcity is exacerbated by the increasing demand for large facilities, making it increasingly difficult to expand data center capacity.
2. **High Operational Costs:** Data centers are energy-intensive, accounting for approximately 7% of the nation's total energy consumption. This high energy demand has raised sustainability concerns, leading the government to impose a moratorium on new data center developments in 2020. While the moratorium aims to reduce carbon emissions, it has also hindered the industry's growth.
3. **Regulatory Challenges:** Singapore's regulatory standards for data center development are among the most stringent in the region. Companies must comply with high standards of energy efficiency and environmental sustainability, which include the use of advanced cooling technologies and renewable energy sources. While these regulations present challenges, they also create opportunities for innovation in sustainable data center technologies.

Significant Trends

As Singapore leverages its strategic advantages, several emerging trends are shaping the future of its data center market. These trends not only underscore the country's commitment to sustainability and innovation but also offer significant opportunities for both local and international stakeholders. Here are the key developments that will drive the next phase of growth in Singapore's data center ecosystem:

1. Sustainability in Data Centers: Singapore has introduced a 300 MW allocation for data centers as part of its Green Data Center Roadmap. This initiative aims to enhance energy efficiency and integrate renewable energy technologies, creating new business opportunities within the market. The roadmap seeks to establish a sustainable growth trajectory for data centers, ensuring they continue to support the nation's digital economy. An example of innovation in this area is Keppel Data Centres' floating data center park, which will utilize seawater for cooling. Other initiatives include exploring hydrogen power plants and cold energy storage systems for data centers.

2. Submarine Cable Expansion: Singapore is poised to expand its submarine cable capacity, although it faces competition from neighboring regions. A recent market report highlighted that while Singapore is increasing its submarine cable capacity, nearby markets like Malaysia are developing 2,500 MW of data center capacity, with 1,800 MW being constructed in Johor, just a short distance from Singapore. To maintain its competitive edge, Singapore plans to double its submarine cable capacity over the next decade, which will require at least \$10 billion in private sector investments.

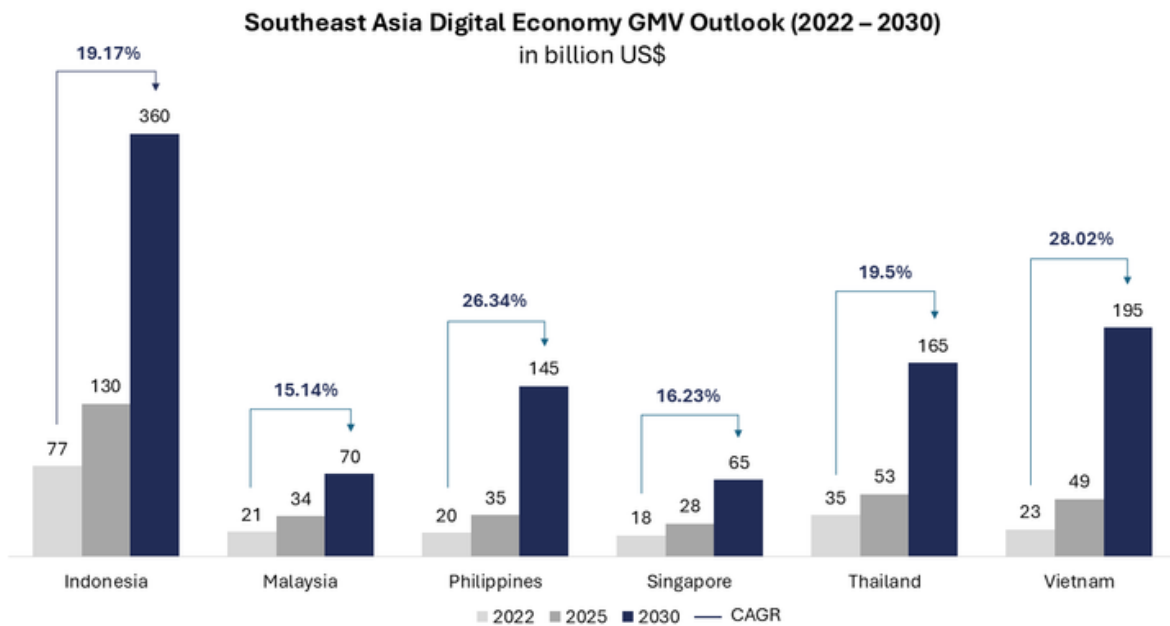
3. Upgrading Older Data Centers: Older data centers in Singapore may struggle to meet new sustainability standards, creating a potential gap in the market. Upgrading these facilities is a complex process that necessitates maintaining uninterrupted service while implementing energy-efficient technologies. The director at IMDA has suggested that scheduled technology refreshes, along with incentives to offset capital expenditures, could help address these challenges. Collaboration among the government, investors, and private sector companies could facilitate funding for these upgrades and promote international partnerships in sustainable data center technologies.

Conclusion

Singapore's strategic location, advanced infrastructure, and commitment to sustainability establish it as a regional leader in the data center industry. However, to maintain this leadership, the country must consistently integrate cutting-edge technologies and innovative solutions. Challenges such as limited land availability and high operational costs also create opportunities for inventive solutions, making it crucial for Singapore to invest in energy-efficient data centers, renewable energy technologies, and expanded digital infrastructure to stay competitive in the global market.

Singapore is at a crucial crossroads, with significant growth potential driven by its focus on green data centers, AI integration, and improved connectivity. To unlock this potential, the country needs substantial investment to support its ambitious plans for sustainable infrastructure and technological advancement. By attracting global investors and fostering strategic partnerships, Singapore can continue to lead the digital transformation in Southeast Asia, creating substantial growth opportunities in a rapidly evolving industry.

Indonesia - Overview

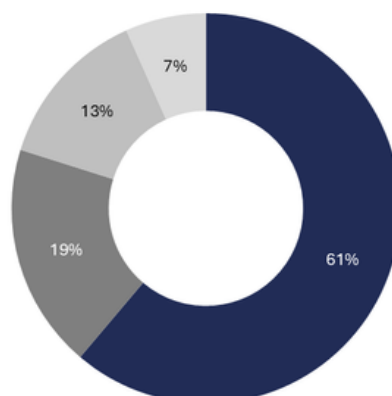


Sources: Google, Temasek, Bain & Company

Indonesia, Southeast Asia's largest economy, is experiencing an unparalleled digital transformation. With a population exceeding 270 million people, the country has become a dominant force in the region's digital economy. The government's commitment to digital innovation, through initiatives such as the "Making Indonesia 4.0" roadmap underscores its ambition to establish Indonesia as a global technology hub by 2030.

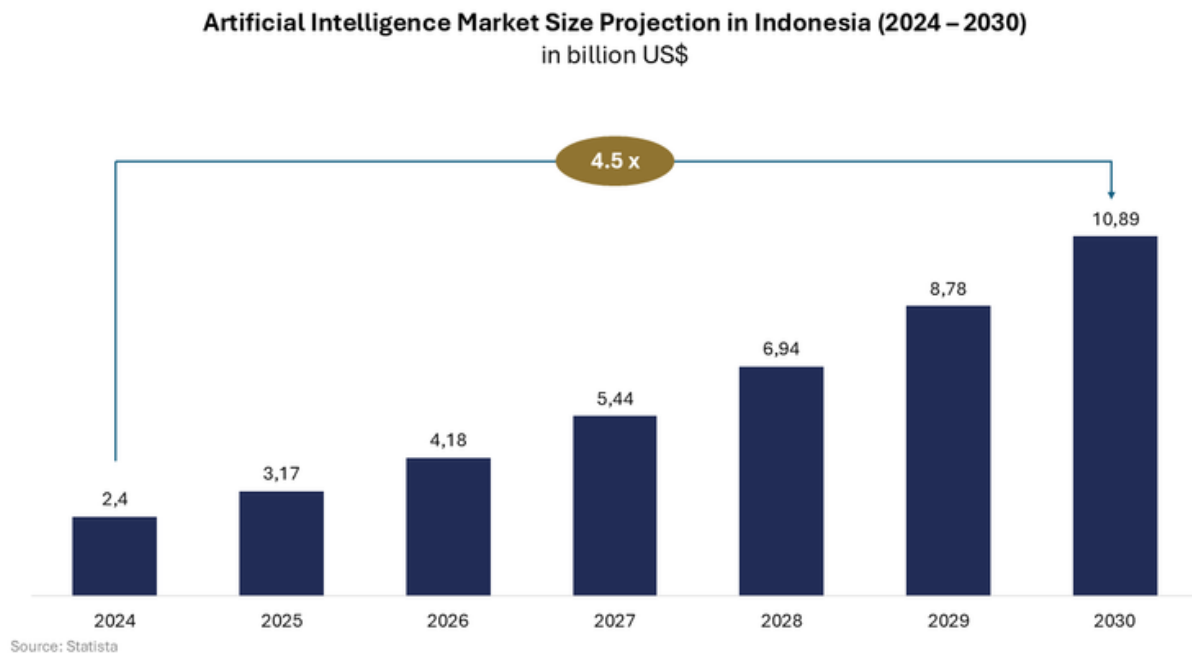
Indonesia's Digital Economy by Sector 2025
in GMV

■ e-Commerce ■ Online Travel ■ Ride Hailing ■ Online Media



Sources: Google, Temasek, Bain & Company

The digital economy is at the forefront of Indonesia's economic growth. As of 2025, e-commerce dominates the market, accounting for 61% of the country's total digital economy. With the increasing reliance on online shopping and digital transactions, businesses are leveraging artificial intelligence (AI) to enhance personalization, streamline logistics, and optimize customer engagement.



AI's integration into Indonesia's digital ecosystem is fueling exponential growth in the AI market, with projections indicating that the sector will expand 4.5 times by 2030. This rapid evolution underscores the increasing demand for high-performance computing, data processing, and AI-driven analytics, which in turn is driving the need for robust data center infrastructure.

As AI adoption accelerates, Indonesia's data center market is set for unprecedented growth. The country currently ranks second in Southeast Asia in data center capacity, with 200 MW, yet demand is projected to increase by over 268% in the coming years. This creates a compelling investment opportunity for foreign investors looking to capitalize on the country's expanding digital infrastructure needs.

Foreign Investment Driving Indonesia's Data Center Boom

Indonesia's favorable investment climate has attracted significant foreign participation in its data center development. International technology firms and investment groups are recognizing the country's potential, injecting substantial capital into hyperscale and enterprise data center facilities to support its expanding digital ecosystem.

In 2023, Princeton Digital Group (PDG), a major player in the region, strengthened its presence by launching Jakarta Cibitung 2 (JC2), a hyperscale data center in Greater Jakarta. Designed with energy-efficient technologies, the facility reduces its environmental impact while accommodating Indonesia's growing data consumption. STT GDC Indonesia also marked a milestone with the launch of its new data center campus in 2023, catering to hyperscale cloud providers and enterprises that require high-performance computing infrastructure. Similarly, EDGNEX, a digital infrastructure arm of DAMAC, is developing a 15 MW data center in Jakarta, reinforcing the capital's position as a regional hub for digital innovation and showcasing the power of foreign investment.

Telkom Indonesia, the country's largest telecommunications provider, is actively seeking strategic foreign investors to strengthen its data center business, NeutraDC. The company has enlisted Goldman Sachs and Mandiri Sekuritas to assist in securing investment, with Telkom's SVP of Corporate Communication and Investor Relations, Ahmad Reza, emphasized the importance of this initiative. NeutraDC currently operates 29 data centers, including five global and three enterprise facilities within Indonesia, along with numerous edge data centers. The company is also expanding its hyperscale footprint, breaking ground on a new AI-driven hyperscale data center in Batam in June 2024.

Strengthening its regional presence, Telkom integrated its Singapore-based Telin data centers under the NeutraDC brand in March 2024. These developments underscore Telkom's long-term commitment to expanding Indonesia's digital infrastructure aligns with the government's broader vision for digital growth. "NeutraDC is positioned to be a key player in Indonesia's digital economy, providing seamless access to businesses and users across the region," Reza added.

Beyond traditional data center operators, global technology leaders are making major investments in Indonesia's digital infrastructure. Microsoft, for example, has committed USD 1.7 billion to expand its cloud services and AI capabilities in Indonesia. This initiative aligns with the Golden Indonesia 2045 vision, which is aimed at positioning the country as a global economic powerhouse. The investment will support the development of AI infrastructure, the training of 840,000 Indonesians, and initiatives to grow the local developer community.

In another strategic move, Equinix, Inc. and PT Astra International Tbk have partnered to develop Indonesia's digital infrastructure, ensuring the country has secure, scalable, and interconnected data solutions. These large-scale investments highlight Indonesia's attractiveness as a data center investment destination, offering significant opportunities for global investors.

Key Opportunities

Several key areas present lucrative investment opportunities in Indonesia's data center sector.

- **Hyperscale and Colocation Data Centers:** The rapid adoption of cloud services and AI applications has heightened the demand for hyperscale and colocation data centers. Investments in greenfield and brownfield projects, as well as partnerships with local telecommunications and cloud service providers, are strategic avenues for growth. Major players like EdgeConneX Inc., NTT Ltd, PT Sigma Tata Sadaya, and PT Faasri Utama Sakti are actively contributing to the market's expansion.
- **Renewable Energy-Powered Data Centers:** With Indonesia's commitment to sustainability, there is a growing emphasis on renewable energy sources for data centers. Investments in off-grid solar and wind power solutions, along with energy-efficient cooling systems, align with global trends toward carbon-neutral operations. The government's goal to achieve net-zero carbon emissions by 2060 further supports this initiative.
- **AI and Edge Computing Infrastructure:** The proliferation of AI applications necessitates edge computing facilities to support real-time data processing. Investments in edge data centers enhance connectivity and reduce latency, meeting the demands of AI-driven services. The integration of technologies like AI, IoT, and edge computing presents significant opportunities, especially with the increasing number of internet-connected devices.
- **Smart Cooling and Energy-Efficient Technologies:** As data centers consume substantial energy, there is a pressing need for innovative cooling technologies and energy-efficient designs. Investments in liquid cooling, free cooling, and battery storage solutions contribute to reducing operational costs and environmental impact. The market is witnessing a trend toward larger facilities, with operators developing mega data centers with estimated IT load capacities exceeding 70 MW each.

Barriers to Entry

Despite the immense growth potential, investors must navigate several challenges to successfully establish data center operations in Indonesia:

1. **Energy Costs and Sustainability Challenges:** Indonesia's electricity sector is monopolized by PLN (Perusahaan Listrik Negara), resulting in relatively high tariffs compared to neighboring countries. Additionally, renewable energy adoption remains costly, and limited incentives exist for green energy procurement. Investors looking to establish sustainable data centers may face difficulties in accessing affordable renewable power sources.

2. Infrastructure and Connectivity Limitations: While Indonesia has made significant advancements in digital infrastructure, disparities in connectivity remain a challenge, particularly outside Java. Investing in secondary markets such as Sumatera, Kalimantan, and Sulawesi presents opportunities but also requires strategic partnerships to ensure sufficient fiber connectivity and power supply.

3. Land Acquisition and Regulatory Complexity: Land acquisition for large-scale data centers, especially in Jakarta, can be costly and bureaucratic. Investors must navigate zoning laws, permit approvals, and environmental regulations, which can slow development timelines. Alternative locations, such as Batam, offer fewer barriers and lower land costs but require stronger infrastructure investment.

4. Skilled Workforce Shortage: The rapid expansion of Indonesia's digital economy has outpaced the supply of skilled professionals in cloud computing, cybersecurity, and data center operations. According to a World Bank Report, technology graduates of Indonesia frequently fall short of the industry norm, and there will be a shortage of 9 million ICT professionals by 2030. To address this, the government has introduced the Digital Talent Scholarship (DTS) program, in partnership with global tech leaders, to train a new generation of IT professionals. However, talent retention remains a concern as competition for skilled engineers intensifies.

Seizing Indonesia's Data Center Opportunities

Indonesia's data center market is on the cusp of exponential growth. As AI, cloud computing, and e-commerce continue to expand, the need for high-performance, scalable, and sustainable data centers has never been greater. This presents a golden opportunity for foreign investors to tap into a rapidly growing sector. However, challenges such as land acquisition, energy costs, and regulatory hurdles require a strategic approach. Indonesia is set to become a regional data hub, and with the right approach, you can be at the forefront of this transformation.

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www.harringtonblue.co.uk

info@harringtonblue.co.uk

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