



Research Report

Data centre in Indonesia: Unveiling the potential to become the next digital hub



Indonesia | July 2021



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Executive summary

In the past three years, major local and international data centre players, from developers and investors to end-users, have gradually entered the Indonesian market, attracted by the country's socio-economic potential.

The increased adoption of cloud-based services also drives demand for data centres as Indonesia is home to many start-up companies, including Gojek, Tokopedia and Traveloka. This robust ecosystem attracts global cloud players, such as Alibaba Cloud, Google Cloud Platform, Amazon Web Service, Microsoft Azure and, most recently, Tencent Cloud as they have launched their data centre facilities in Indonesia.

Both local and foreign operators and developers, such as DCI Indonesia, Telkom Indonesia, NTT, STT GDC, Keppel DC and Princeton Digital Group, have also established their data centre facilities here.

Greater Jakarta is seen as the key market in Indonesia, especially Cikarang and Karawang areas. As of 2020, Greater Jakarta has a data centre capacity of more than 70 MW*. This means that the data centre market in Indonesia is still at a nascent stage; hence, underserved – especially when compared to similar markets such as India which has 447 MW**.

However, the sector is anticipated to grow and evolve rapidly as it has in many other markets in the region and globally. This quick response is supported by Indonesia's potential, such as:

- As of 2020, Indonesia has 200-million internet users and 170-million social media users; one of the biggest online markets globally with 1.25 mobile phones per capita.
- Digital payment users and transaction value in Indonesia are expected to grow by 60% and 100%, respectively, in the next five years.
- Cloud revenue is expected to triple over the next five years.
- To some extent, 5G licences have been recently issued to some operators and there will be more to follow.

With the government improving the country's infrastructure via reliable power sources and fibre optics for better network connectivity, more data centre facilities are expected to materialise inside and outside of the Greater Jakarta area.

As the population is transitioning to a new digital world, Indonesia's data centre industry is here to stay and will see a much stronger growth in the years to come.

*Structure Research

**JLL; <https://www.us.jll.com/en/trends-and-insights/research/data-center-outlook>



01 | Data centre evolution

Global players are coming

In the beginning, Indonesia developed data centres mainly via self-managed enterprises that built, owned and operated facilities for their end-users. Eventually, companies emerged with increased computing needs, driving the need for in-house IT resources and self-owned facilities and equipment.

Subsequently, as has happened elsewhere, there was a surge in demand from both local and multinational companies to either outsource their IT needs, or place their IT equipment in data centre facilities managed by third-party specialist operators; hence, more colocation data centres came online.

With a growing digital economy from e-commerce, more than 2,250 start-ups¹ and numerous small and medium-sized enterprises (many of which, incidentally, are still housing their IT servers inside their offices) combined with new consumer behaviour caused by the pandemic and increasing internet penetration and smartphone adoption, there still remains a significant demand for centres

from these businesses as they shift from traditional set ups to either colocation data centres or cloud platforms. Nowadays, cloud systems are considered an opportunity and a solution due to the cost-effectiveness for individuals as well as big enterprises.

Thus, global cloud providers and operators such as Alibaba, AWS, Google, Microsoft and Tencent are competing to establish their presence in Indonesia with Greater Jakarta as their primary market. Meanwhile, both local and foreign operators and developers, such as DCI Indonesia, Telkom Indonesia, NTT, Keppel DC and Princeton Digital Group, have also launched their data centre facilities.

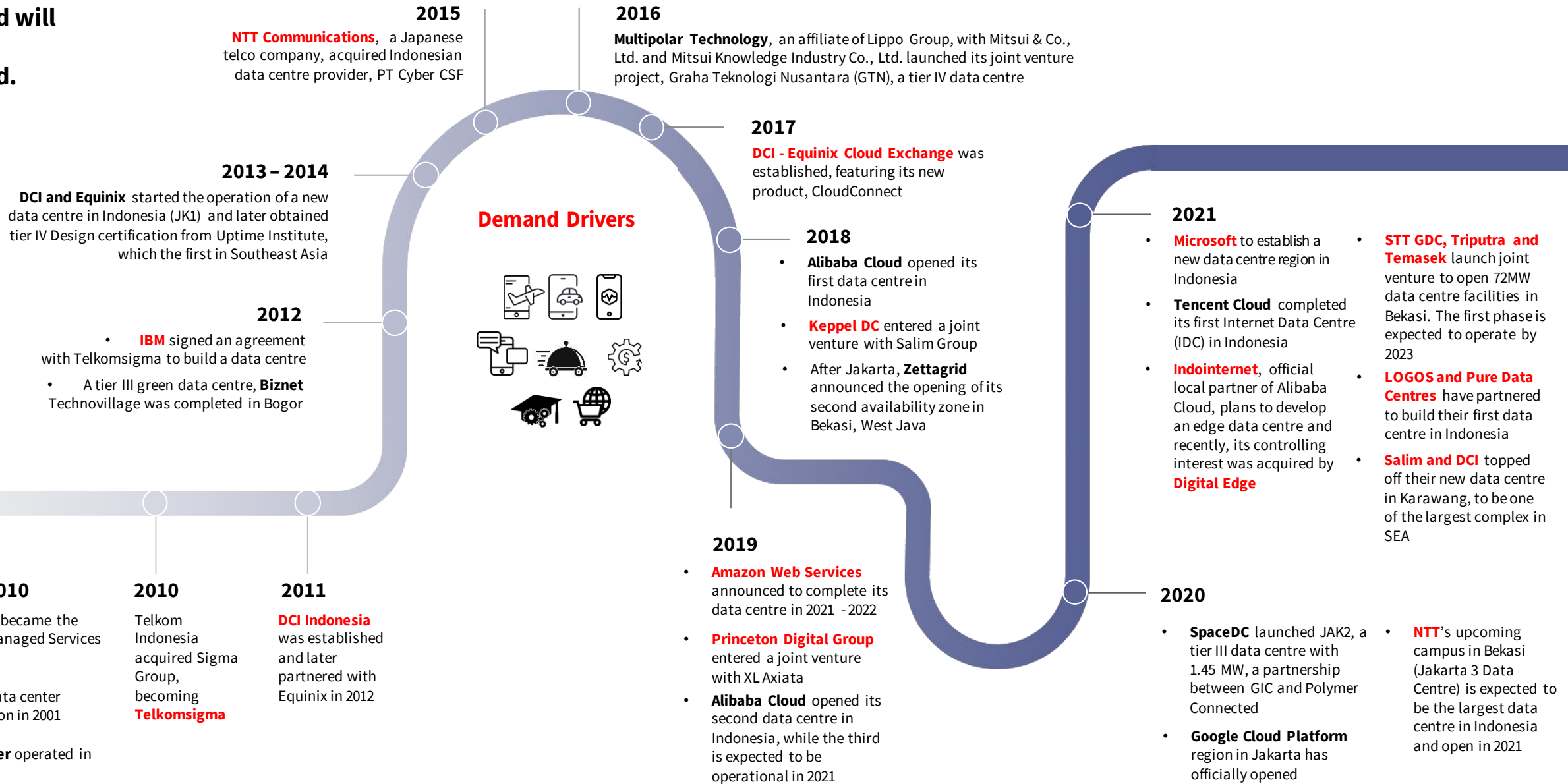
Furthermore, STT GDC, Digital Edge, and recently, LOGOS partnering with Pure Data Centres just announced their plan to build data centres in Indonesia.



¹<https://www.startupranking.com/countries>



Colocation and Cloud demand will keep thriving going forward.





02 Opportunities in a rapidly evolving sector

Surge in investor and operator activities

The colocation market in Greater Jakarta was estimated to have more than 70 MW² data centre capacity in 2020. It is at a relatively nascent stage and underserved compared to other markets with similar demographics, i.e., huge population and increasing internet users. India currently has around 447 MW³ and will continue to grow their capacity in the future. While Singapore, as one of the primary markets in the region, has reached 357 MW².

However, in the past three years, major local and international data centre players, from developers and investors to end-users, have gradually entered the Indonesia market, looking to benefit from Indonesia’s socioeconomic potential.

Due to the large demand pool, both local and foreign operators and developers have shown interest in this alternative asset class. Investment groups, such as private equity groups and sovereign wealth funds (SWFs), have also taken part in shaping Indonesia’s data centre landscape. While it is not mandatory to do so, as there are no

foreign ownership restrictions that apply for data centres, some international operators have entered the Indonesia market by aligning with a local partner with the ability to source relatively low-priced land or those with existing land banks since land costs constitute around 15-20% of the total development cost. In addition, a local partner can also assist with bureaucratic dealings and fibre-connectivity requirements. Keppel DC and Salim Group have adopted this approach and are forming a joint venture to build a data centre facility in Bogor. Other examples include STT GDC with Triputra and Princeton Digital Group with XL Axiata.

Other than JV arrangements, investments are typically made via build-to-suit deals with respective occupiers, or greenfield investments. Microsoft, one of the hyperscale cloud providers, has invested heavily in Indonesia and has announced the opening of its own data centre here.



²Structure Research

³<https://www.us.jll.com/en/trends-and-insights/research/data-center-outlook>

In terms of end-users, while there has been strong demand from highly regulated banking and financial institutions as well as enterprise customers, currently it is online media companies, cloud providers and other businesses which are starting to actively look for data centre facilities.

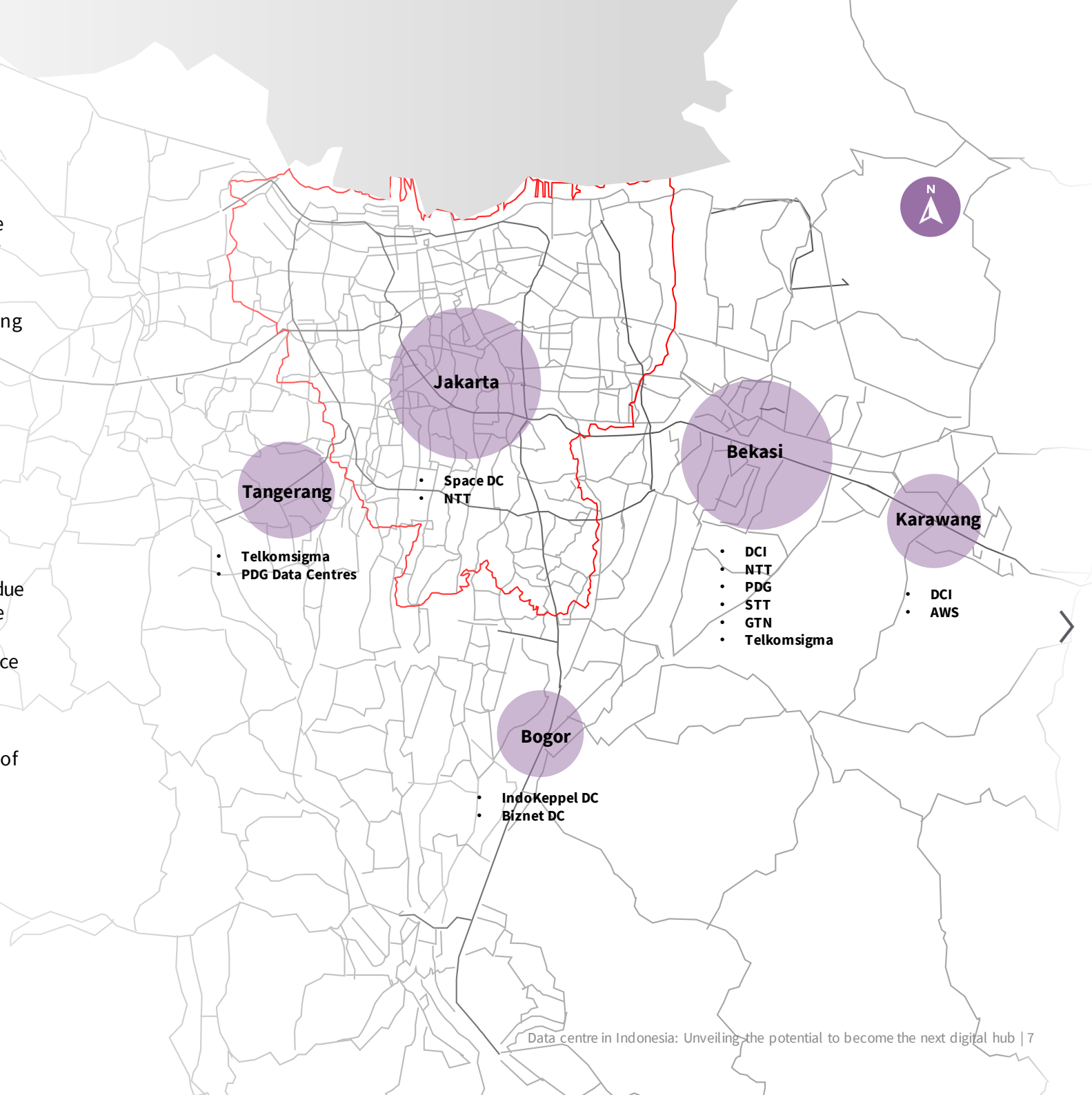
Currently, Greater Jakarta is still seen as the key market in Indonesia, with some existing colocation facilities located in Central Jakarta, Bogor and Tangerang. However, within the past four years, end-users and players have been tapping into the eastern part of Jakarta, such as Cikarang and Karawang areas (see map).

Due to the high demand for advanced conveniences and utilities, such as power and water supply as well as fibre connectivity with vigorous security requirements, hyperscale data centres are suitably located within industrial estates, while some operators and developers may consider developing smaller assets inside Central Jakarta, Bogor and Tangerang due to its proximity to end-users.

Besides Greater Jakarta, we also see Batam as a future data centre hub for Indonesia due to the development of a new special economic zone (SEZ) that will be dedicated to the digital economy and tourism. Additionally, its geographical location is relatively safe from natural disasters and it is in close proximity to Singapore, which should help entice some players to establish their presence there.

While currently, there are only a few data centre developments in Batam; however, growing demand for the Batam area is expected. Data Centre First has bought 2.75 ha of land to build multiple data centres⁴, and recently, Telkom Indonesia, together with Etisalat, is reportedly planning to invest around USD 100 million for data centre development⁵.

Government of Indonesia has also planned to build national data centres (Pusat Data Nasional) in four locations: Bekasi, Batam, New Capital City (East Kalimantan) and Labuan Bajo to consolidate its 2,700 data centres across Indonesia⁶.



⁴<https://www.straitstimes.com/asia/se-asia/data-centre-operators-eye-batam-as-new-digital-hot-spot>

⁵Coordinating Ministry for Economic Affairs (KEMENKO PEREKONOMIAN)

⁶Ministry of Communications and Informatics (KEMENKOMINFO)



03

Forward looking

Government support to provide better infrastructure and internet penetration

Indonesia is shaping up to be Southeast Asia’s strategic digital hub. Despite some challenges in Indonesia’s data centre sector – particularly with relation to infrastructure and network connectivity – data centre real estate investment in Indonesia is attractive to both local and international players alike.

The sector will continue to grow and evolve rapidly as it has in many other markets in the region and globally. This growth will be driven by the expanding young and middle-class populations, the rise of the digital economy, strong macro-economic fundamentals and a growing number of internet users.

Going forward, we anticipate more development of data centre facilities from both local and international players. For example, DCI Indonesia, one of Indonesia’s leading data centre providers, plans to build data centre facilities with total power of 200 MW in the future⁷.

Developments are also anticipated to take place outside Greater Jakarta with government support to provide better infrastructure and internet penetration in other areas. Some opportunities include developing the new capital city in East Kalimantan as a smart city and supporting the Batam area due to its proximity to Singapore.

⁷www.dci-indonesia.com

Success - A score card of what is needed in the next ten years

Infrastructure	<ul style="list-style-type: none"> Government shall commit to delivering the infrastructure projects, specifically those related to power sources and fibre optics. Spending will spur further economic growth and improve network connectivity.
Regulatory environment	<ul style="list-style-type: none"> The personal data protection bill will be ratified into law. International best practices will assist in the sector’s growth.
Digital economy	<ul style="list-style-type: none"> E-commerce and financial technology sectors to grow significantly. Expect to see continued investment in the digital-economy sector from international global investors and players.
Demographics	<ul style="list-style-type: none"> Indonesia’s large population offers the scale required for the sector to grow. Huge proportion of young population and tech-savvy generation.
GDP growth	<ul style="list-style-type: none"> Economic growth has been stable in the last five, pre-pandemic years, at around 5% and is projected to be back on track post pandemic. Information and communication sector to grow significantly above average and contribute more from time to time.
Emerging middle class	<ul style="list-style-type: none"> Indonesia’s middle-class will continue to expand, disposable incomes are expected to rise, and the number of internet users should grow. As a result, digital payments will become more popular, driven by e-commerce growth as well as the move to cashless transactions.



04 | Localization laws are in play

Some relaxations may apply

Since 2019, the data localisation provisions in Indonesia have been relaxed slightly. While previously the government required electronic system operators (undefined) to establish their data centres in Indonesia, currently, it only applies to public domain electronic system operators. Consequently, the regulations related to data localisation will have an impact on Indonesia’s data centre market. However, Indonesia’s socioeconomic potential will still attract notable cloud providers and operators to establish their presence in Indonesia. In addition, the cost-effectiveness is derived by deploying their data centre facilities locally instead of serving the market from other regions.

Government Regulation No. 71/2019 **Implementation of electronic systems and transactions**

Under this regulation, the government requires public domain electronic system operators (government institutions and other institutions appointed by government) to conduct its management, processing and/or store or their electronic system and data within Indonesian territory.

Meanwhile, private domain electronic system operators (local/foreign individual, entity or institution) may conduct those activities overseas.

However, financial services still need to refer to the applicable regulations imposed by the Financial Services Authority (locally known as OJK).

The Financial Services Authority Regulation No. 13/POJK.02/2020 and No. 4/POJK.05/2021 **Application of risk management in the use of information by commercial banks and non-banks**

These regulations were imposed by The Financial Services Authority specifically for financial institutions.

Non-bank financial institutions with total assets of more than IDR 500 billion are required to have both a data centre and a disaster recovery centre.

Both bank and non-bank financial institutions’ electronic systems must place its data centres and disaster recovery centres within Indonesia territory.

However, financial institutions may still be allowed to host their data centres overseas subject to approval by the authority if some requirements are fulfilled.

Personal Data Protection Bill 2020⁸

The final draft was tabled in early 2020 and is planned to be passed into law this year.

The bill stipulates a comprehensive set of provisions for the protection of different types of personal data, stakeholders’ rights and obligations, processing and transferring, data protection officer appointments, dispute resolutions, and even administrative and criminal sanctions.

Indonesia will become the fifth country in Southeast Asia to implement regulations regarding Personal Data Protection.

⁸Digital Trust NewsFlash Digital Services / May 2020, PwC

05

Some challenges may hinder

Power and connectivity are considered as one of the main issues



Fibre optic and power sources

Indonesia's domestic fibre-optic coverage still has some challenges. While incoming connections reaching metropolitan areas are getting better, there is still only limited connectivity to the rest of the country, particularly in the remote, rural areas. While all provinces have been covered with fibre-optic capabilities, only 36% of Indonesia is covered⁹. Some of the major providers of fibre-optic are Telkom Indonesia, which covers most of Indonesia area; others include Moratelindo, XL Axiata, Indosat Ooredoo and Biznet. These providers also develop in-land fibre infrastructure that connects submarine cables leading to data centres or metro areas as well industrial estates.

Reliable power sources are also one of Indonesia's main challenges. The primary electricity provider is state-owned PLN, which also provides renewable energy resources with different service types available. Aside from PLN, there are also private power providers available, especially within industrial estates in Cikarang area and, as expected, the private power comes at a premium rate.

One of the benefits of being in an industrial estate is that those fibre optics and power sources are already connected with the network; hence, it is more convenient.



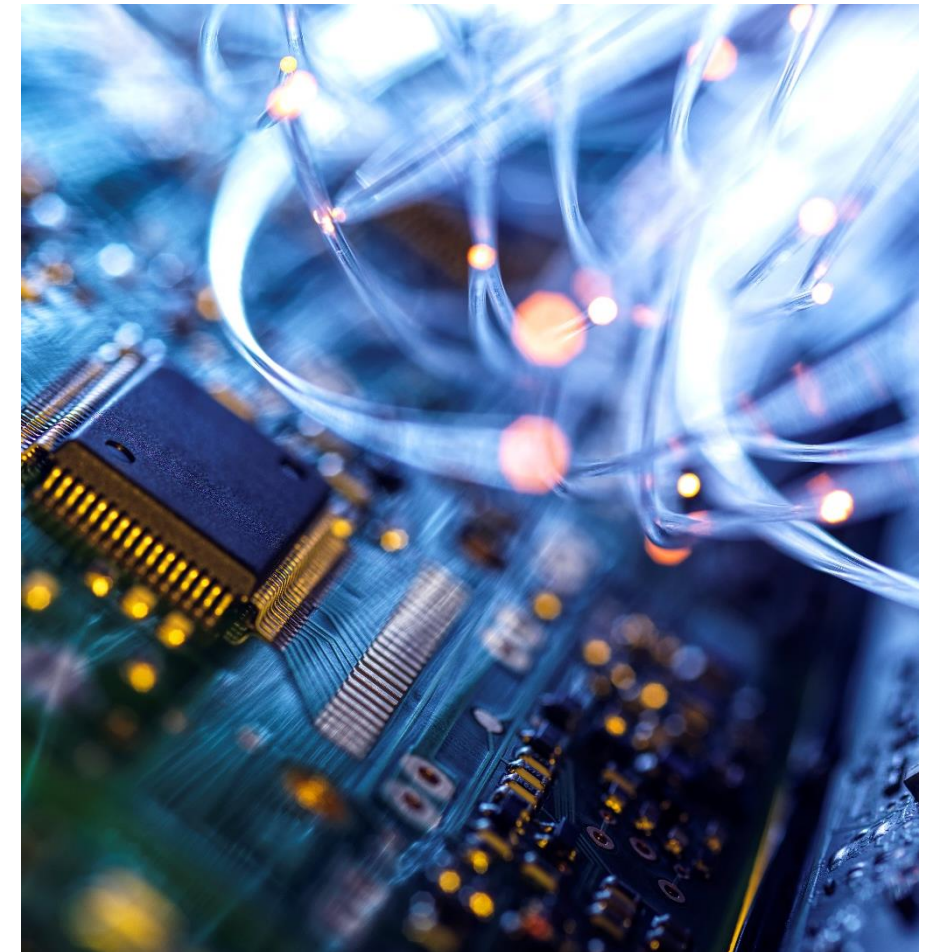
Infrastructure

Indonesia's geography is one of the main factors affecting its connectivity, making connectivity relatively uneven across all of Indonesia. Currently, sufficient infrastructure is still concentrated in Java Island, specifically in Greater Jakarta area.



Environmental risks

Indonesia's urban flood and earthquake hazards are classified as high. Hence, location assessment to determine proper placement of data centres is important. However, the pre-existing hazard information, with a certain level of detail, such as 50- to 100-years flood plain, may not be available in some areas.



⁹Ministry of Communications and Informatics (KEMENKOMINFO)



06

There will be some improvements

More support infrastructure is expected going forward



Electricity

35,000 MW Programme

The additional 35,000 MW programme is planned to support higher economic growth and increase the electrification ratio not only for power plant construction projects, but also for transmission and substations. The programme is targeted to complete by 2028¹⁰. Currently, around 24% is operating and more than half is still in the construction phase (Figure 1). In terms of total capacity, as of June 2020, Indonesia already obtained almost 71,000 MW with around 63% of it located in Java, Bali and Nusa Tenggara¹⁰.

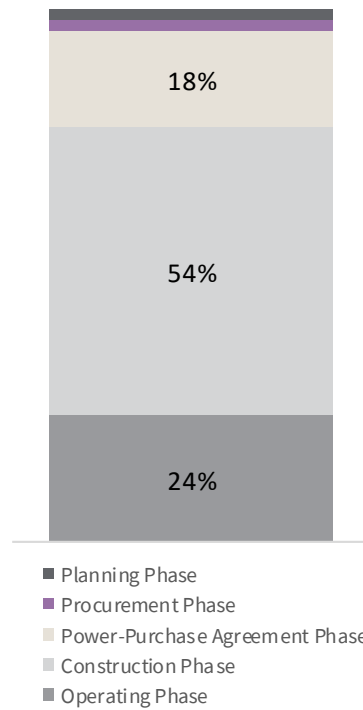
Electricity and mobile data prices

Indonesia's electricity price for businesses is the lowest among Southeast Asia countries, at around USD 0.071 per kWh – slightly lower than the price in Vietnam. Meanwhile, Singapore has the highest price at USD 0.127 per kWh (Figure 2).

With regard to mobile data prices, Indonesia also has a relatively low rate compared to its regional peers at USD 0.42 for 1 GB mobile data (Figure 3).

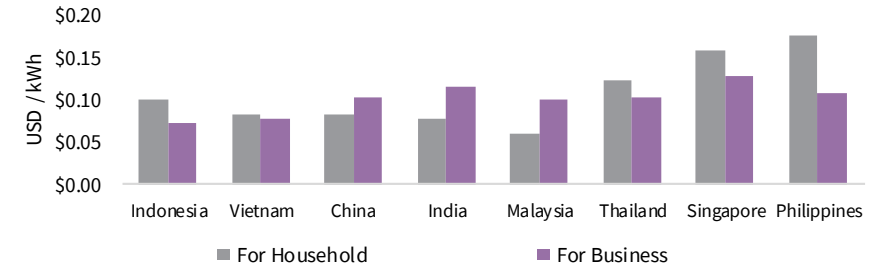
Lower data prices could increase the number of users as well as usage. Hence, the government has a target to lower the price from the income-per-capita average of 1 GB mobile data of 0.45% in 2020 to 0.25% by 2024¹¹.

Figure 1
The Progress of 35,000 MW Program per August 2020



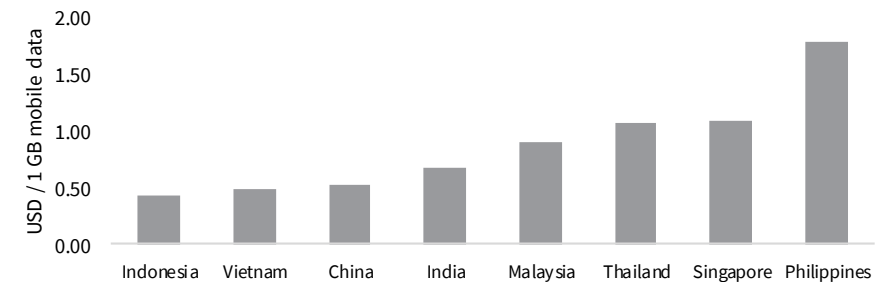
Source: Committee for Acceleration of Priority Infrastructure Delivery (KPPIP)

Figure 2
Electricity prices per kWh per September 2020



Source: globalpetrolprices.com

Figure 3
Average price of 1 GB mobile data in USD per March 2021



Source: Cable.co.uk

¹⁰Ministry of Energy and Mineral Resources (KEMENESDM)
¹¹Ministry of Communications and Informatics (KEMENKOMINFO)



Network & connectivity

The Palapa Ring project and SATRIA satellite

Indonesia is continuing to improve its internet network by building the digital infrastructure to welcome more digital players to the market and reap the full benefits of digital transformation.

In October 2019, the government completed the construction of the Palapa Ring, a comprehensive nationwide network made up of underseas fibre-optic cables and Broadcast Tower Station (BTS) Network, divided into three regions – West, East, and Central – in an effort to enhance telecommunications infrastructure across the country¹².

In addition, Indonesia plans to launch the Satellite of the Republic Indonesia (SATRIA-1), its biggest telecommunication satellite in 2023. With the capacity of 150 Gbps, it is envisioned to boost connectivity within the country¹².

5G

In January 2019, the Ministry of Communications and Information Technology of Indonesia announced plans to restructure spectrum allocations to facilitate refarming from 2G to 3G/4G in the lead up to offering 5G connectivity. The government issued 5G licences to two operators in mid-2021, however, the services are still limited and will improve in a gradual manner¹³.

INDIGO Consortium, Echo & Bifrost Subsea Cables

In May 2019, INDIGO Consortium’s subsea cable system that connects Singapore to Perth via Jakarta was ready for use¹⁴. Meanwhile, Facebook and Google recently announced plans to build two new subsea cables to connect Singapore, Indonesia and North America¹⁵. This new infrastructure will boost Indonesia’s attractiveness as a data centre market.

--- Indigo : Singapore – Jakarta – Perth – Sydney
--- Echo & Bifrost : Singapore – Indonesia – North America



¹²Ministry of Communications and Informatics (KEMENKOMINFO)

¹³<https://jakartaglobe.id/tech/indonesia-launches-5g-network-but-frequency-limitation-leaves-many-in-blank-spots>

¹⁴<https://subpartners.net/indigo.html>

¹⁵<https://engineering.fb.com/2021/03/28/connectivity/echo-bifrost/>

07 Rise of the digital economy

Growing demand from technology companies

E-commerce

Traffic on e-commerce platforms has surged during the pandemic. In 2020, the forecast of total e-commerce revenue was adjusted to increase by an extra 9.2% from the previous number, due to the expected positive impact caused by the pandemic (Figure 4). E-commerce revenue is currently expected to be around USD 30.3 billion (Figure 4). Food delivery and personal care are expected to profit the most from COVID-19 in Indonesia.

Although purchases are currently centred around basic needs, a growing number of these transactions are done through digital commerce.

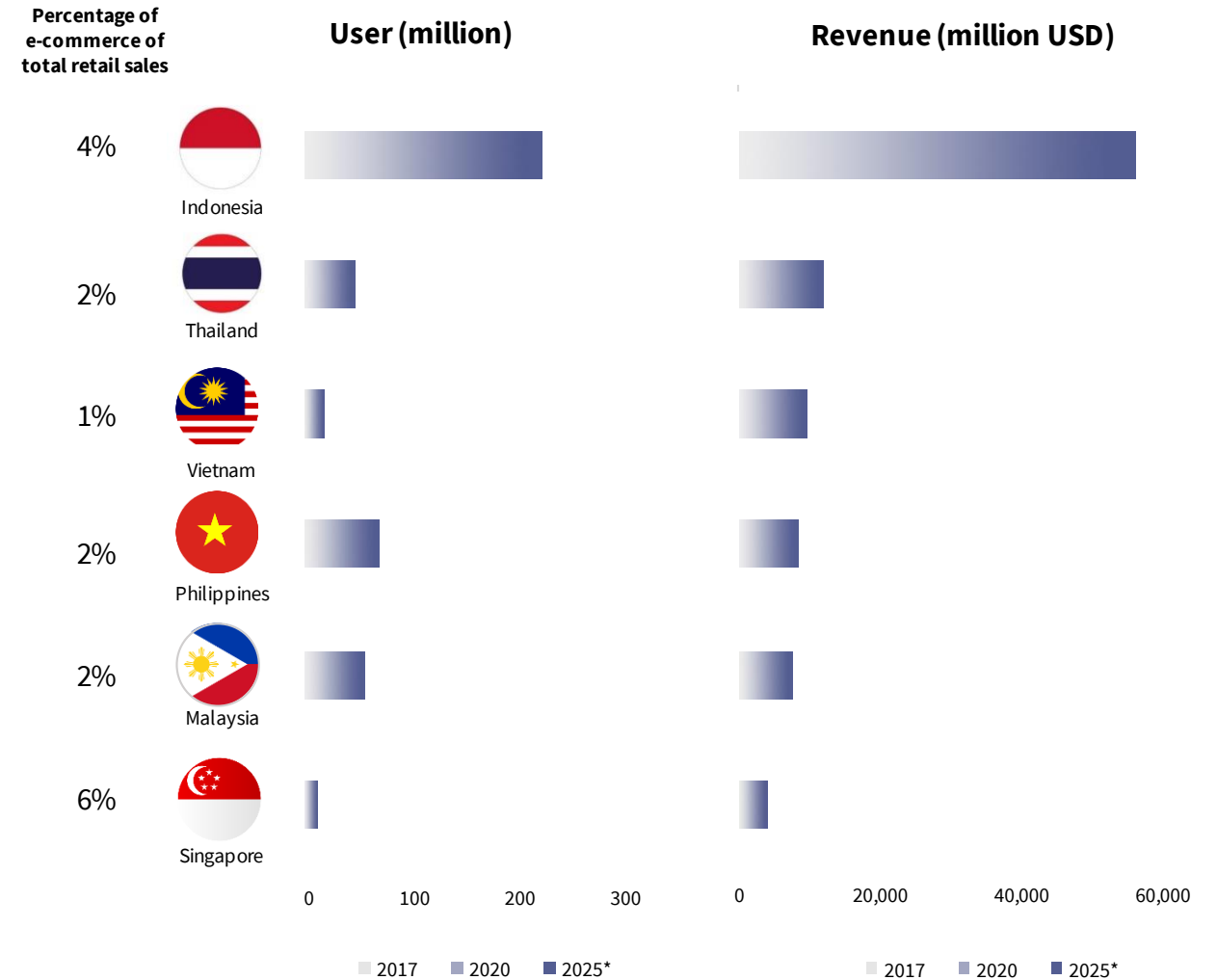
While e-commerce was previously considered as an 'optional' instead of 'essential' business move, retailers have currently come to realise that online shopping is an increasingly popular choice for many customers and the pandemic has accelerated this with most shoppers staying at home due to the current situation.

E-commerce has been on the rise in Indonesia for a while now and is not expected to stop anytime soon. This is also reflected in how e-commerce players are actively looking for warehouse space, which is making the logistics sector one of the most resilient sectors during the pandemic.

Indonesia's e-commerce users have been growing significantly and are expected to continue to grow by 60% compared to 2020, to 221 million users by 2025. Currently, e-commerce penetration is around 50% of the population¹⁶, while the internet population is around 73%.

Indonesia's e-commerce revenue is expected to grow to approximately USD 56.4 billion in 2025 from USD 8.5 billion in 2017 with a CAGR of around 27% (Figure 4).

Figure 4
SEA E-commerce users and transaction value



* forecast data

Source: Statista

¹⁶Digital Buyer Penetration – Statista

Financial services

In 2014, Bank Indonesia initiated the national noncash campaign (locally known as Gerakan Nasional Non Tunai) to support Indonesia’s vision of becoming Southeast Asia’s digital hub.

With the rise of ride-hailing apps, Indonesians have become quite adaptive to digital payment concepts, especially the younger generations. In addition, as Indonesia’s e-commerce market growth is also driven by its youthful population, digital payments dominate its payment methods as of 2020¹⁷.

At present, the adoption of digital payments in Indonesia – especially in urban areas – has seen remarkable growth, from offline retail merchants and public transportation, to the payment of utility bills.

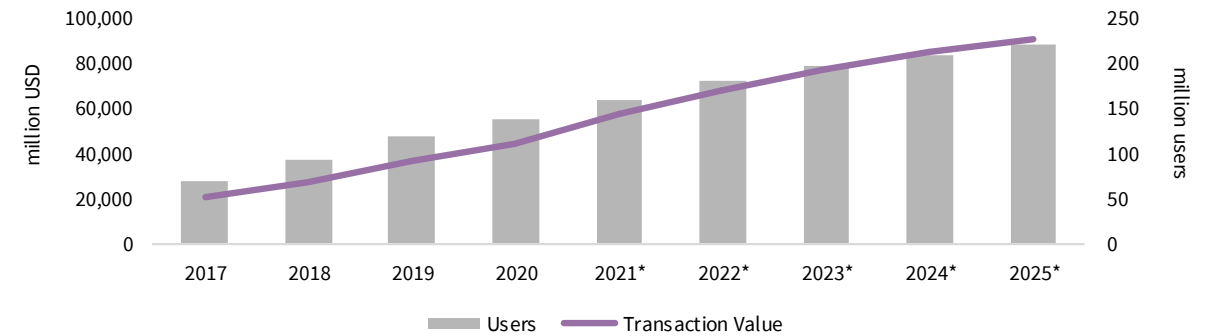
The number of people using digital payments systems in 2020 almost doubled the number of 2017 users and is expected to grow 60% by 2025. Consequently, the growth of its transaction value will more than double by 2025 compared to 2020 (Figure 5).

A similar trend has been seen in online banking penetration. While it is still relatively low at 25% in 2020, it is expected to be almost double that by 2025 (Figure 6).

The growing consumption of digital services naturally fuels the demand for data centre services as well, particularly in Indonesia’s financial services industry.

Figure 5

Digital payments users and transaction value in Indonesia

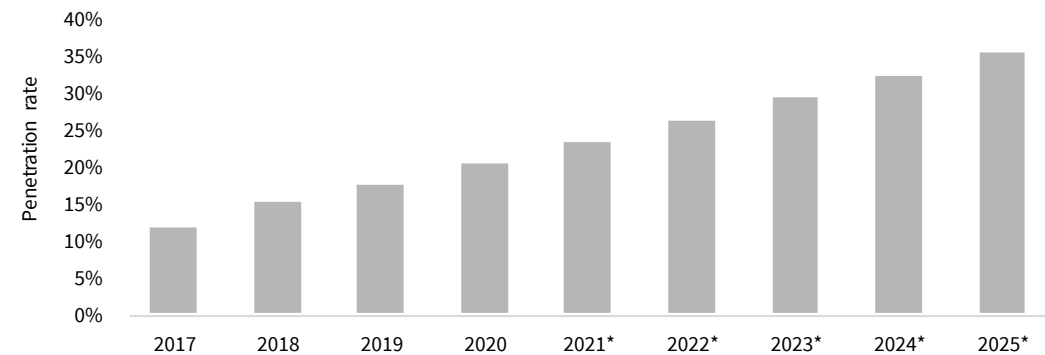


* forecast data

Source: Statista

Figure 6

Online banking penetration forecast in Indonesia 2017-2025



* forecast data

Source: Statista

¹⁷Digital Shopping Behaviour – Statista

Other sectors

Aside from the main sectors of the digital economy, there are other emerging sectors that can also have positive impact on data centre growth in Indonesia.

Most **Online Media** subsectors, such as digital music, video games and video-on-demand, experienced a spike in the number of users in 2020, with nearly a 20% increase compared to the previous year (Figure 7). Social restrictions have forced people to find entertainment online. Users in this segment are expected to rise significantly in the future.

Similarly, during the pandemic, platforms rapidly on-boarded more eateries and merchants, and pivoted their commerce capacity towards deliveries. Hence, **Online Food Delivery** has seen the highest growth compared to other e-services (dating services, event tickets and fitness), with almost 30% more new users. This number is expected to grow 43% by 2025 (Figure 8). One of the factors driving the growth is the mandate on restaurants and cafés to limit ‘dine-in’ service; hence, more people order takeout. Similarly, online fitness is also experiencing a steep uptick with an additional 30% of users logging in during the pandemic due to capacity restrictions on gyms.

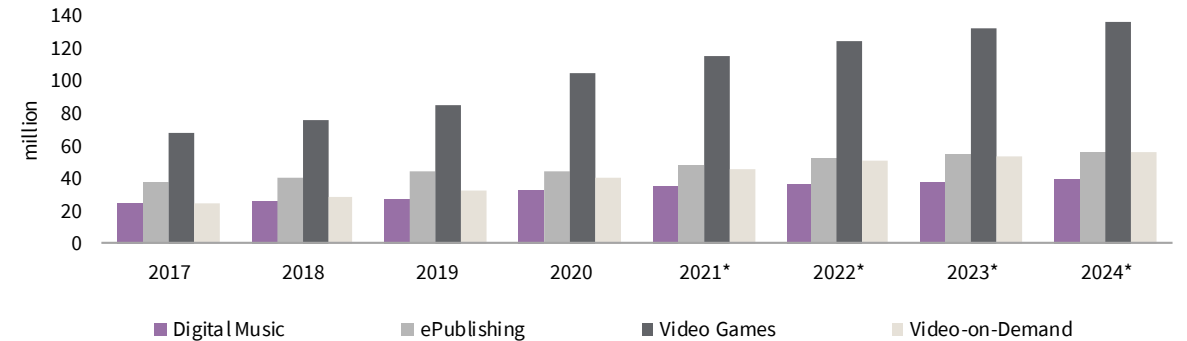
“HealthTech usage has grown by 4x and has retained its users post-lockdown.”

- Google, Temasek, Bain&Company (e-Economy SEA 2020 report)

There are two nascent sectors that have accelerated growth due to the pandemic: **HealthTech** and **EdTech**. HealthTech has emerged as an alternative for people who wish to avoid visiting hospitals and it may become the new norm post-COVID. Meanwhile, online learning is popular due to restrictions on classroom activities and has substituted in-person employee training.

Unlike other sectors that experienced growth, **Online Travel** and **Ride-hailing** activities declined significantly during the pandemic. However, the post-pandemic growth outlook for these sectors is still promising.

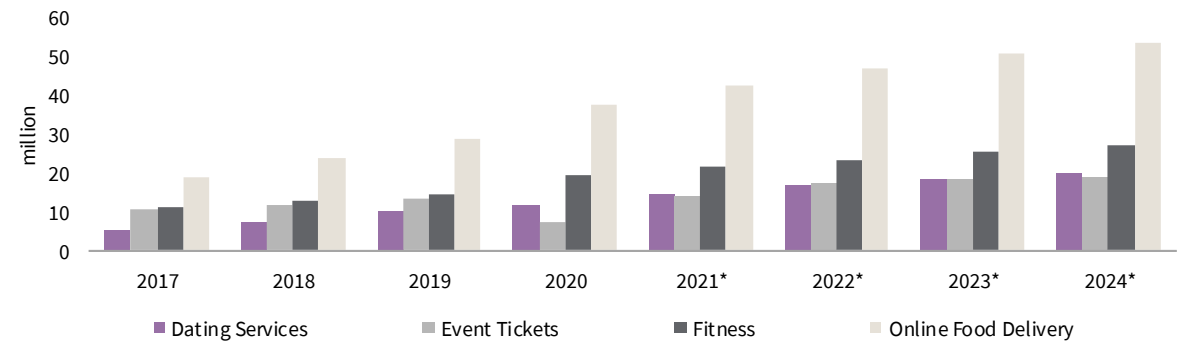
Figure 7
Digital media users by segment in Indonesia



* forecast data

Source: Statista

Figure 8
eService users by segment in Indonesia



* forecast data

Source: Statista



08

Cloud economics

Indonesia is the second-highest among its regional peers

Demand for data centres in Indonesia is driven by local and international businesses' growing adoption of cloud-based services, and is underpinned by technological advances.

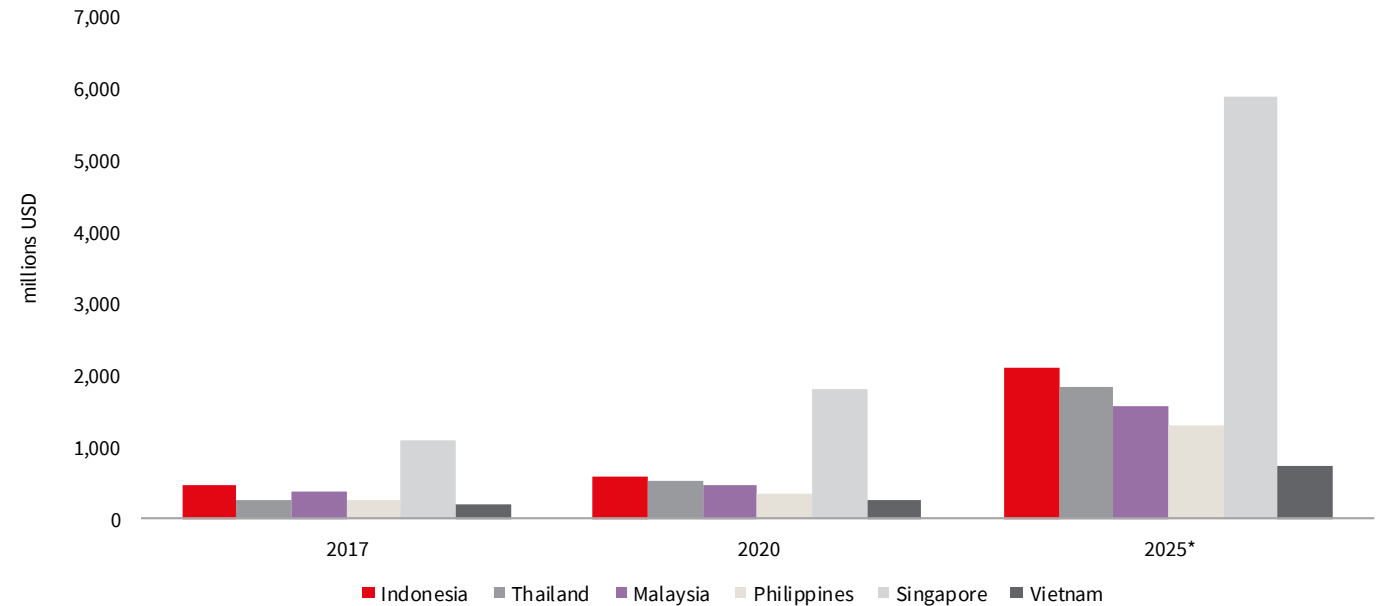
Indonesia, with a population of 270-million people and as a growing start-up ecosystem in Southeast Asia, is expected to become a key market for cloud-based, on-demand computing service providers. Some corporations are heading towards remote working, which is also driving the demand for cloud computing.

In terms of revenue, Indonesia is the second-highest earner among SEA countries, coming in at around USD 600 – or 15% of the total cloud-based revenue in Southeast Asia, led only by Singapore with around USD 1,800 USD. The revenue is likely to keep growing and is expected to more than triple that of 2020 by 2025 (Figure 9).

Global cloud providers such as Alibaba Cloud, Google Cloud Platform, Amazon Web Service, Microsoft Azure, and recently Tencent have shown interest in Indonesia.

Figure 9

Public cloud revenue in Southeast Asian countries



* forecast data

Source: Statista



09

Socioeconomic driving forces of the demand

Indonesia landscape attracts investors

Indonesia is the fourth most populous country globally and the largest in Southeast Asia¹⁸. With a considerable proportion of tech-savvy youth, favourable demographics are fuelling growth for data centres across the country.

Currently, around 73% out of 270 million people use the internet daily²⁰, making the nation one of the biggest online markets worldwide. The figures are estimated to increase in the coming years as the internet has been an increasingly important part of most Indonesians' daily lives, especially due to the pandemic.

Growth was also seen in Indonesia's per user data consumption, which almost doubled from 2017 (1,300 MB) to 2019 (4,200 MB)²⁰ as Indonesians, on average, spent 8 hours and 52 minutes daily using the internet, ranking them eighth globally²¹.

As some people use more than one mobile phone, mobile connections in Indonesia were around 125.6% of total population as of January 2021, which is higher than the average global number of around 102.4%²¹.

With around 170-million users in 2020, Indonesia is also one of the largest social media markets in the world. The average time spent per day using social media (3 hours, 14 minutes) is higher than the global average (2 hours, 25 minutes)²¹.

As the population is transitioning to a new digital world, Indonesia's data centre industry is here to stay and will see a much stronger growth in the years to come.



The **largest economy in SEA¹⁸**, with the information and communication sector has been constantly growing since 2016, outpacing headline economic expansion



One of the biggest online markets, with **73% internet penetration** or **almost 200 million** internet users



The **fourth most populous country** in the world with growing middle-class



Growing data consumption per user with daily internet use average time spent rank 8th globally



54% of its population are Gen Z and Millennial¹⁹ – more tech-savvy



One of the largest social media markets with the average time spent per day is higher than the global average

JLL's multidisciplinary team is here to help you develop your strategy, make correct investment decisions, navigate the various processes and manage data centre facilities. Spanning capital markets, alternative investment, and facilities management, our specialists provide end-to-end services for your needs.

¹⁸Oxford Economics

¹⁹Central Statistics Agency

²⁰Statista

²¹We Are Social, Hootsuite



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