

INTERVIEW



**INVESTMENT OPPORTUNITY:
TELKOM INDONESIA
(QUESTIONS & ANSWERS)**

**PRESENTED FOR:
GLOBAL FDI REPORT**

Jakarta, March 12th 2020

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QUESTION NO. 1

President Hon. Jokowi and UAE signed \$23 billion worth of deals. One of the deal was a memorandum of Understanding (MoU) between SAAL Operating System – Sole Proprietorship LLC (Saal.ai) and PT Telekomunikasi Indonesia Tbk. (Telkom) related to digital education for K- 12 in Indonesia worth 23.5 million dollars. Where would you like to accelerate capacity building, transform performance and leverage the new digital backbone between UAE and Indonesia?

Answer:

1. EDUCATION IN INDONESIA (AT A GLANCE)

- a. Indonesia, home to 264 million people (2017, World Bank), is the fourth most populous country in the world, has by far **the largest student age population in the ASEAN and the third-largest population under the age of 25 in the entire world** (WENR, 2019).
- b. Refers to educational data and statistic from Ministry of Education and Culture RI (2018) shows the number of Indonesian schools are **more than 216 thousand schools with 45 million students at all level (primary, junior secondary and high school)**. Furthermore, Indonesia's ICT spend potential to accelerate from ~IDR 236Tn to IDR ~410Tn in 2024, whereas 5 key verticals industry expected to drive **47% of 2024 ICT spend, which were including finance, government, logistic, health and education** (Gartner, 2017)
- c. As **President Joko Widodo** stated, **one of the main focus of the Indonesia Maju (Indonesia Moving Forward)** is to aims and to create a developed Indonesia that is "sovereign, independent and with characteristics based on *gotong royong* [mutual cooperation]", which **priorities sector are human development**, economic competitiveness, arts and culture, rule of law and defence and security.
- d. **President also reminds Minister of Education and Culture** that focus on human development were related to the condition of **equitable distribution of Indonesian education**, standardization of the **quality of education, curriculum**, and application of **technology in the education system**. All these to be solved together with multi parties.
- e. Thus, **education is the most important pillar** to build a huge potential human resources quality and competitiveness in Indonesia. It might be **supported by the resources and leadership of international partners**.

2. TELKOM's CAPACITY BUILDING FOCUS AREA IN EDUCATION

- a. Building a **robust infrastructure** (including horizontal & vertical platform) to support learning enabled by technology

- b. To **provide rural, remote, and underserved areas** with resources to take advantage of high-quality **digital learning experiences, digital resources, and access to online courses** taught by effective teachers.
- c. Develop a **consistent, seamless and coherent digital experience** for students and teachers while develop their **digital skills and knowledge**.

3. HOW TO TRANSFORM PERFORMANCE IN EDUCATION SECTOR

- a. To bring digital transformation in education, **digital talents are essential to ensure digital enablement**, which were aligning with Telkom's mission **to nurture best-in-class digital talent** that helps develop nation's digital capabilities and increase digital adoption.
- b. Successful education systems must **develop new and creative approaches** to achieving results in order **to meet the education challenges ahead**. It can be **reached by everyone and create more effective** learning systems.
- c. Measures to ensure that these resources are used **efficiently to deliver the best returns**, and reforms that **support students to learn and gain the skills** they need to become productive and successful person

4. TO LEVERAGE THE NEW DIGITAL BACKBONE BETWEEN UAE AND INDONESIA

- a. **Invest in the education** interventions and approaches that deliver the best results and **collaborative leadership** to make everywhere, all-the-time learning possible in realising a good return on investment in the digital environment.
- b. Both parties can support **cross-program collaborations to integrate technology meaningfully**, encourage quality and effectiveness, ensure equitable opportunities to use technology to develop skills valued, encourage interoperability across systems, and provide access to quality instructional resources (including platform and content), devices and robust broadband connectivity.
- c. **Far-reaching innovation is needed** to reach new and updated trends, lower costs, enhance teaching, and offer new ways for all teacher and students to gain skills.

QUESTION NO. 2

His Highness Sheikh Mohammed bin Zayed Al Nahyan, Crown Prince of Abu Dhabi has agreed to lead a committee that will oversee the construction of a smart city for Indonesia's new capital in East Kalimantan that is estimated to cost \$34 billion. Please elaborate on how Telkom will be integral to building fiber optics and investing in sustainable broadband infrastructure.

Answer:

Background

The Indonesian government has determined to build a New National Capital (*Ibu Kota Negara*, abbreviated as IKN) as a symbol of a country that gathers diversity according to the philosophy of unity in diversity. The development of IKN on the island of Kalimantan considers the condition in which Indonesia has one of the largest tropical forests in the world so that the new IKN will not be like a city in general. The Rimba Nusa concept chosen as the design of the new capital will actually protect and improve the forests in the location of the national capital in East Kalimantan. According to the plan the new capital that will be occupied later is a production forest, not natural forest or tropical forest. Of the 256,000 hectares only 56,000 hectares will be used later. IKN will be built with a green concept and integrated with technology or smart city regulating how people live side by side with nature and more environmentally friendly. The IKN will be green and full of oxidation, no waste, many people will walk and ride bikes, use public transportation, and provide emission free based on electric cars. Some new capitals in other countries have been built such as New Delhi India that was motivated by political and economic factors, Canberra Australia designed filled with modern and old buildings, Naypyidaw Myanmar with a very small population not proportional to the city area, and Brasilia Brasil was built with a modern architectural concept.

The development of IKN is planned to begin with planning, preparing regulations, preparing land, building infrastructure and starting settlement. The settlement will begin in 2024. While the planning for long-term stages of the planned area of IKN are as shown below

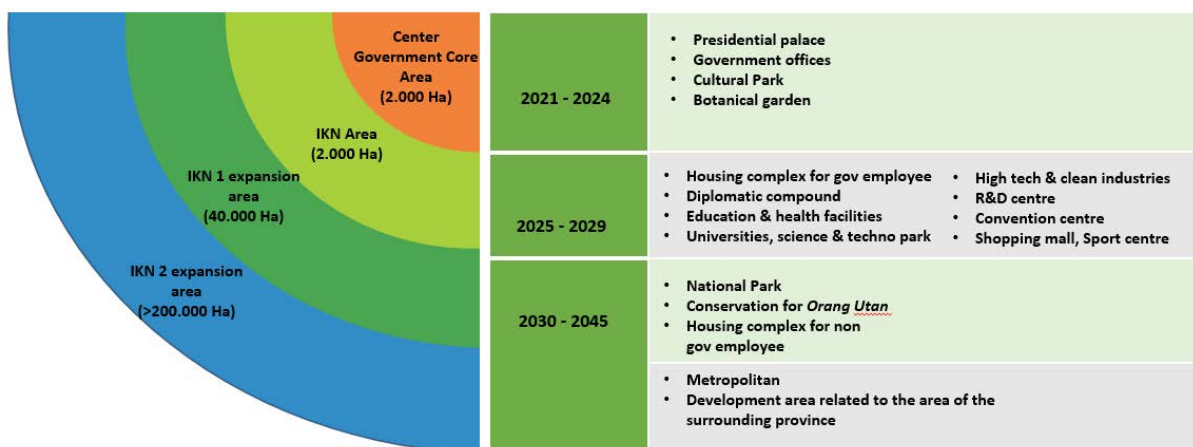


Fig 2.1: Phase plan and scope of IKN

IKN has a vision as a catalyst to improve Indonesia's human civilization that reflects the nation's identity, guarantees social, economic, and environmental sustainability. A city that is socially inclusive, economically productive and environmentally friendly. A city, relying on information and communication technology to achieve the goals of Sustainable Development Goals (SDG). IKN will be designed with capabilities:

- Integrated public transportation modes;
- Utilizing information and communication technology to increase work productivity;
- Collaboration between modern architecture and local wisdom;
- Application of modern design, materials and technology;
- Smart building and use of renewable energy;
- Design that prioritizes meeting all Sustainable Development Goals targets as a reference for city development.
- Implement IoT technology / sensors to monitor quality of environmental such as air and water pollutions, plant and animal condition



Fig 2.2: Smart City Services at IKN

IKN will be built through systematic and integrated planning, ranging from futuristic but rich design with local wisdom & green concept, to smart, autonomous and intelligent urban planning. This integrated planning is to ensure all places and certain points, through a combination of broadband fiber network and 5G large capacity mobile, can support smart city services using IoT, Big Data and AI. IKN will have a smart city management capability to create a smart society with the support of smart transportation, sustainable urban drainage systems, smart energy, smart hospital, green building and smart water treatment systems.

Solution from Telkom

Telkom will answer the needs of developing the National Capital comprehensively from the service level, the platform to the Fiber Optic Infrastructure and other broadband services. As an SOE in the field of ICT, Telkom will collaborate further with relevant parties such as other SOEs as well as Ministries and Institutions such as PUPR and Bappenas, as well as the IKN Authority Agency which will soon be established by the President.

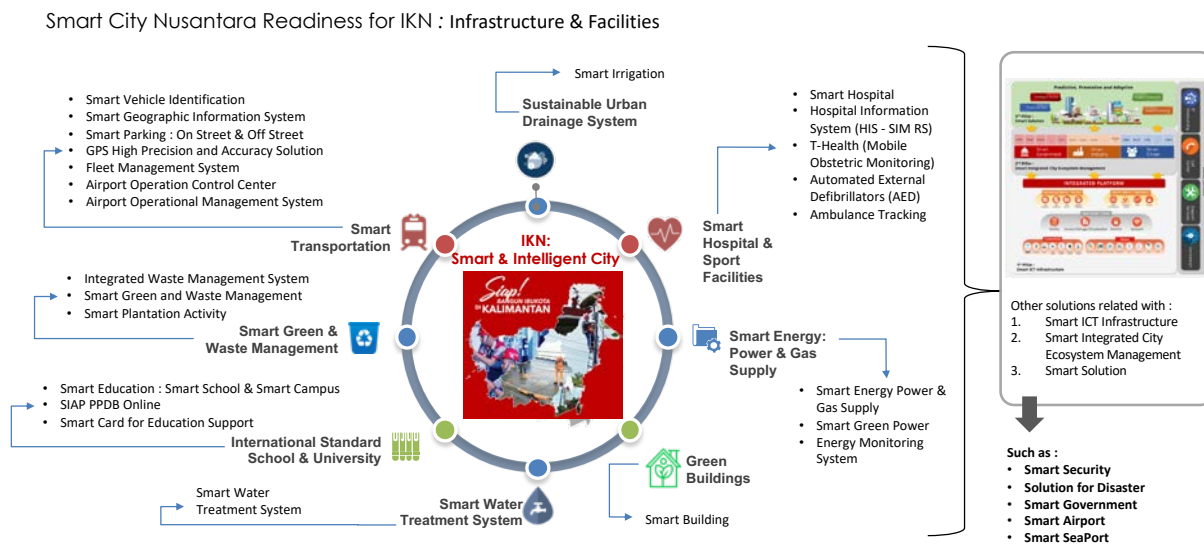


Fig 2.3: Telkom Smart City Solutions in IKN

Telkom Group Infrastructure development support and plans:

1. Existing Broadband Infrastructure in Kalimantan

Regarding with the readiness of broadband infrastructure on the Kalimantan Island, Telkom has deployed:

- 1 Data Center
- 2 Main PoP & 6 Primary PoP
- 9,300 km fiber optic
- 17,800 Telkomsel's BTS
- 9,300 Access Points

which are connected directly to the International Gateway via Batam and Manado.

To support current broadband services in East Kalimantan, where the new capital will be built, Telkom has deployed :

- 1 Data Center
- 4 Primary PoP
- 2,700 km fiber optic
- 5,500 Telkomsel's BTS
- 3,200 Access Points.

2. Broadband Infrastructure Plan for New Capital

In order to prepare the broadband infrastructure of the new National Capital, Telkom will deploy:

- Fiber optic access networks from 2 TCloud connected to 2 Primary PoP and 2 Main PoP.
- Diversity backbone network by 2nd Ring of Balikpapan-Penajam Submarine Cable and 3rd Ring of Balikpapan-Samarinda.
- In addition, to strengthen the coverage and quality of mobile services, Telkom will add around 95 new sites in the location of the core government areas and supporting strategic locations in the vicinity.

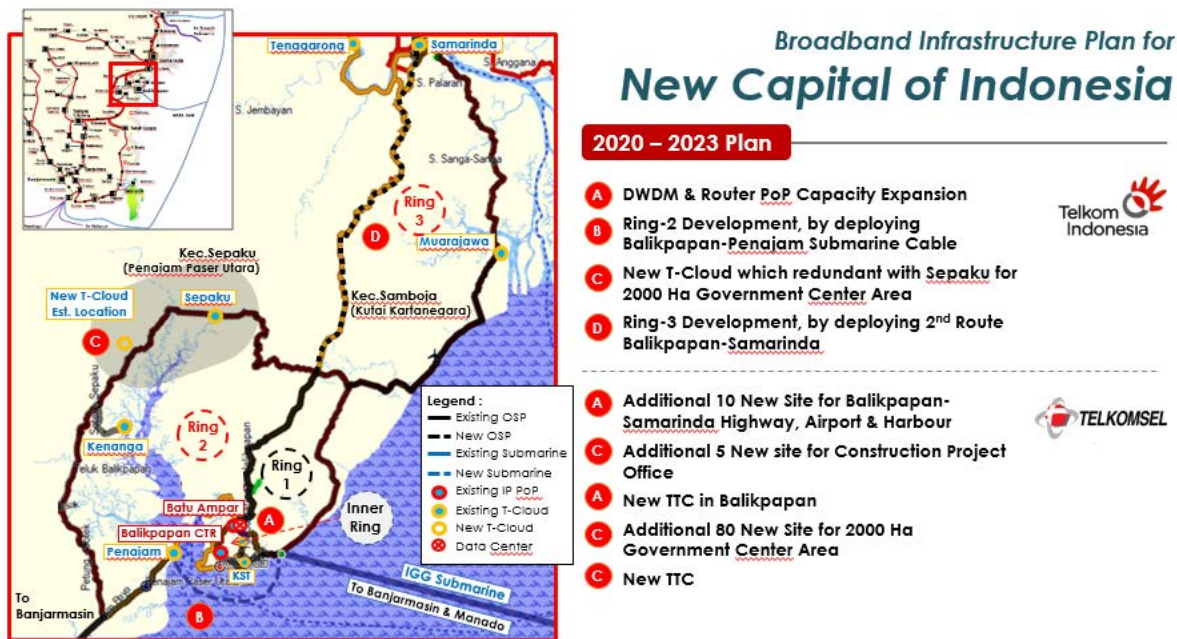


Fig 2.4: Infrastructure Preparation Plan for the National Capital

QUESTION NO. 3

Regarding World Expo 2020, UAE invested US\$8.7 billion and will highlight such developments that are transforming the telecoms industry, such as 5G, AI, Big data, IoT, and automation. What types of new innovations and technologies would like you like to transfer from the UAE to build telecoms ecosystem here in Indonesia?

Answer:

Digitalization in Indonesia

Digitalization in Indonesia have a potential impact of up to USD 121.4 Bn to Indonesian GDP by 2025. The top 3 sectors contribute the most are manufacturing USD 34.4 Bn, retail USD 24.5, and transport USD 15.5 Bn. The digitalization impact will be driven by operation optimization, human health & productivity, and product & sales development.

Sector	Estimated 2025 GDP base impact	Operation optimization	Human health and productivity	Product and sales development
Manufacturing	34.4	29.4	3.0	2.0
Retail	24.5	12.5	6.7	5.3
Transport	15.5	13.6	1.9	0.0
Mining	14.8	14.0	0.5	0.3
Agriculture	11.0	10.6	0.3	0.0
Telecom and media	7.9	5.7	1.7	0.5
Healthcare	6.6	2.2	4.3	0.0
Public sector and utilities	4.8	4.7	0.1	0.0
Financial	1.8	1.1	0.1	0.6
Total	121.4	93.8	18.7	8.9

Source: Based on McKinsey Global Institute Study "Unlocking the potential of the Internet of Things," Team analysis adjusting figures for Indonesian context

Focus Area: IoT (Internet of Things)

Global Situation

The Internet of Things is an emerging technology which promises to change our way of doing things through better information in real-time and improved learning opportunities. IoT is closely related to the concepts of Machine-to-Machine (M2M) communications and Wireless Sensor Networks (WSN) on the connectivity side, and to Big Data in terms of the content outcomes produced.

Many different stakeholders are involved in active IoT projects on the ground, including industry members, universities, NGOs, and tech start-ups, each contributing different strengths. The IoT is not just a story for industrialized economies or industrial applications, but is equally relevant for developing countries . The IoT and connected sensors are driving improvements to human wellbeing in healthcare, water, agriculture, natural resource management, resiliency to climate change and energy.

Impactful IoT interventions in development can improve efficiency and/or enhance effectiveness. In advancing global development, IoT interventions are helping to improve research, public policy, basic service delivery and the monitoring and evaluation of programmes across a range of different sectors include in healthcare, water, agriculture, natural resource management, resiliency to climate change and energy .

Indonesia Situation

IoT in Indonesia is one of the new initiatives from Government in supporting national campaign “Making Indonesia 4.0”. In this program, Government drives to adapt industries and enterprises to become Industry 4.0. The objectives of this program include driving Indonesia’s industries become more efficient and enterprises more competitive.

Making Indonesia 4.0 is a roadmap made by the Indonesian government to penetrate the Industry 4.0 era with the following objectives:

1. To become the top 10 world economic power based on GDP (2030).
2. Doubling the productivity-to-cost ratio.
3. To Encourage net exports to be 10 percent of GDP.

Indonesia will build five manufacturing sectors with regional competitiveness, food and beverages, textile & apparels, automotive, electronic & chemical.

Telkom Group Capabilities

Telkom has defined main initiatives to support Government of Indonesia through IoT development. IoT is part of horizontal platform that Telkom Group prepared. Platform is main part of IoT value chain. Telkom’s IoT Platform named “Antares” is the horizontal platform that accommodate all type of sensors, connectivity. It has served some vertical industries and government. In connectivity, Telkom has also deploy NBIoT and Lora. Telkomsel is Telkom’s subsidiaries in cellular that cover across the country.

Telkom’s IoT product has served some industry verticals like manufacture, agriculture, mining and energy, mobility. In order to deliver the service to customer, Telkom Group also partnered with companies that come from various background like devices, network, system integrator and manage service company.

Cooperation Opportunity

Since customer is very demanding from customers, enterprise, government, digital industries, Telkom Group is open to collaborate with UAE companies to develop comprehensive product and solution for Indonesia' market. Telkom Group is also willing to explore in people capabilities in IoT technologies.

Focus Area: Robotic & Artificial Intelligence

Global Technology Trend

Technology Trends 2020 identifies the trends that some tech executives companies believes will disrupt businesses in the next decade, and based on insights from some Tech expertist subject matter specialists, the world's leading organizations, academic and industry luminaries, and leading startups, venture capitalists, and technology providers, Tech Trends 2020 explores five key trends, shares examples from organizations on the front lines, and takes a look at what may come, beyond the next horizon. Several of this year's tech trends are responses to persistent IT challenges. Others represent technology-specific dimensions of larger enterprise opportunities. All are poised to drive significant organizational change.

The tech companies can build on this international reputation and work on providing a regulative environment that encourages using robotics and AI in different sectors. It can also utilize the strong research being conducted in its universities in the areas of engineering and materials, in order to develop robotics and AI capabilities centered on social applications.

Indonesia Situation

Indonesia today boasts one of the fastest growing economies worldwide — the largest in Southeast Asia — and an ambitious anti-poverty strategy designed to ensure that the country's rapid growth is socially inclusive. The Government of Indonesia (GOI), keeping pace with the data revolution that is transforming commerce and society, is proactively working to unlock this potential to reshape and boost its economic development efforts.

Making Indonesia 4.0 is a roadmap made by the Indonesian government to penetrate the Industry 4.0 era with the following objectives:

Telkom Group Capabilities

RPA - Robotic Process Automation will become a global trend and at the same time become a new revenue generator for the Telkom Group's business towards industry era 4.0, where the current progress is that RPA is one of the Internal Digitization tools. Implementation of Telkom's Internal RPA as follows :

1. RPA for Network surveillance in the form of automating the process of inspecting a series of devices that are experiencing problems, is very helpful for technician to run SOPs and save time to repair network troubles and check equipment assurances,
2. Assurance analytics for Handling of device interference can be done faster.

3. RPA for handling customer complaint, replacing the repetition manual effort by human to robots in order to increase company value both in terms of business through operational efficiency, and increase performance and reduction of loss opportunity caused by equipment disruptions

Telkom group is also have some use-case in term of Artificial Intelligence (AI) initiatives in several sector as follows :

1. Face recognition (FC) for opening gate to enter the Telkom's building (Telkom landmark tower), based on this initiatives to decrease a queuing of guest
2. Video analytics for rest area monitoring system of Jakarta – Cikampek Toll road (under PT Jasa Marga), the objectives is in order to detect and recognize vehicles which is entering to rest area and communicate the number parking lot are available.
3. Video analytics for IndiHome Video analytics, based on this initiatives the CCTV camera which is owned by customer, can send the alert information based on rule setting by customer (e.g. something has stolen, guest coming to home, etc)
4. Natural Language Processing (NLP) for Bahasa, this is used for text analytics tools especially for social media analytics, text mining, scrapping and crawling data for website or data log,
5. Smart speaker (voice assistant) for IndiHome, when customer would like to change the TV channels, they can change by using voice command so that no need remote control devices,
6. Chatbot for IndiHome, this is the interactive channel between customer and customer service using text messaging

Cooperation Opportunity

1. Video analytics as a service (on top of Digital platform)

Currently Telkom have some use-case related to video analytics, but all the use-case are still on client premises and very customized. Due to similar client also have the same needs therefore we have to build video analytics solution / services can be on cloud, and hopefully we can cover and delivery the services for the market penetration faster than on premises.

2. Face recognition as a services (on top of Digital platform)

Even though Telkom have some expert in face recognition, but we don't have face analytics services as a products, currently we only handle the face recognition based on customized requirement on client premises, so that we need the face recognition on the cloud and can deliver the services faster to customer

3. RPA as a services (on top of Digital platform)

The same with video analytics and face recognition above, RPA is also installed on the clients premises with the specifics requirement. In order to cover the RPA services broader so that we need the RPA as a services on the cloud for selected industry like manufacturing, retail, banking, etc,

Focus Area: Cyber Security

Global Situation

Cybercrime is the greatest threat to every company in the world, and one of the biggest problems with mankind. The impact on society is reflected in the Official 2019 Annual Cybercrime Report, announced today by Cybersecurity Ventures. According to the report, cybercrime will cost the world \$6 trillion annually by 2021, up from \$3 trillion in 2015. This represents the greatest transfer of economic wealth in history, risks the incentives for innovation and investment, and will be more profitable than the global trade of all major illegal drugs combined.

The report predicts global spending on cybersecurity products and services will exceed \$1 trillion cumulatively for the five year period from 2017 to 2021. the next five years. Taken as a whole, they anticipate 12-15 percent year-over-year cybersecurity market growth through 2021. Cybercrime is expected to triple the number of job openings to 3.5 million unfilled cybersecurity positions by 2021 -- which is up from 1 million in 2014 -- and the cybersecurity unemployment rate will remain at zero-percent.

Indonesia Situation

Indonesia, a country with the fourth-largest growth in internet users in the world, is facing both great opportunities as well as significant threats with the development of digital technology and internet. As at January 2019, 56% of the Indonesian population, or around 150 million people, are using the internet. The number represents 13% growth from the previous year. The increase is the fourth-biggest in the world after India, China and the United States. Due to Indonesia's poor cybersecurity system, the country is subject to frequent attacks. As an illustration, in one week in February Indonesia experienced 1.35 million web attacks. These cyber-attacks are mostly hacking cases, targeting government and corporate websites.

In 2018, Indonesia had more than 200 million cyber-attacks. To deal with these attacks, the government has issued regulations and set up a number of institutions in the Defence Ministry and National Police. Those measures are not enough. Indonesia needs to arm itself with a stronger law and build its digital security systems and industry.

In 2017, the government established the National Cyber and Crypto Agency to lead the coordination of various institutions in implementing cyber security. The Defence Ministry handles cyber defence, establishing a cyber-defence centre to oversee governance of this role. The Armed Forces under the Defence Ministry has set up a cyber-unit to carry out cyber defence activities and operations. Meanwhile the police deal with cybercrimes and have established a cybercrime directorate.

Telkom Group Capabilities

Telkom already have Cyber Security Operation Center (CSOC), Acts as a 24x7 security-monitoring, detection and response hub for Telkom Group since 2014. Telkom CSOC gives

the ability to anticipate and respond more quickly to threats, works more collaboratively and share knowledge more effectively.

Telkom Group has subsidiaries engaged in managed security services namely Telkom Sigma and Telkom Telstra (JVC Telkom with Telstra).

Cooperation Opportunity

According to a 2014 report, cybercrime is estimated to cost the global economy a reported US\$400 billion annually with costs predicted to rise to \$6 trillion annually by 2021. Telkom Group is open to collaborate with other companies all over the world to develop comprehensive Cybersecurity product and solution for Indonesia' market.

Telkom Group is also willing to explore in people capabilities in Cybersecurity and Cybersecurity Technology Platform (Examples: Cybersecurity Threat Intelligence, IoT Security and DDoS Attack).

Focus Area: Big Data

Global Situation

Nowadays, the Global exiting internet infrastructure position qualifies it for rapid research in Big Data technology, while the large investment in zones specialized in IT provides a unique test bed for experimentation in Big Data Analytics services and applications.

Indonesia Situation

The Indonesian government has shown a keen interest in pursuing big data transformation in governance. President Joko "Jokowi" Widodo issued Presidential Regulation No.39/2019 on the one data policy. The regulation is intended to gather the national data under an accessible, accurate, integrated and sophisticated system.

Although of high relevance, big data remains an under-addressed topic in politics. Currently the use of technology is limited to complementing existing organizational or administrative practices such as digitizing analog data or to allow remote registration of public services, rather than creating an entirely new value stream from the availability of the new technology. The use of big data as a core component in public policy process remains at large.

Telkom Group Capabilities

Since 2013, Telkom Big Data have established conduct some internal use-case to deliver a data insight for improving performance both more effective and efficient. Currently we have at least 51 use-cases which is running not only for internal Telkom but also for external parties / clients such as government, and enterprise business for making incremental value based on analytics recommendations.

There are some Telkom big data analytics products and services which are delivered to market as follows :

1. Big Box

comes as a solution to the application of platforms and big data analysis to produce insight (insight) that is appropriate to the operational and business needs of the company, so that it can support the decision making, governance, strategy and progress of your company. Big Box: "End to End Enterprise Business and Data Solutions with Big Data Platforms" Universal on-premise big data platform and analysis solution for enterprise. Developments and changes that occur in company data, encourage companies to prepare, create, process, analyse and use very large data (big data) to support business needs.

2. Telco credit score,

Credit Scoring Service is an assessment of your customer trustworthiness and creditworthiness based on his/her mobile behaviors on Telkomsel network service. Our credit score can be used as an auxiliary data for any Financial Institution in an underserved financial market

3. ID Verification

ID Verification is a Location Scoring Insight service for home/work location predictor by utilizing customers Mobile Positioning Data (MPD) up to Village (Desa/Kelurahan) granularity. Our Location Scoring Insight will help you to effectively reduce your physical location survey time and cost for financial product application

4. Lead Generation

Lead Generation Service is leads identification from Telkomsel subscribers based on certain criteria proposed specifically for Financial Institution (FI). Our lead generation will help FIs to relay their product offer to their desired potential market. By using our targeted marketing campaign, we will connect FIs with their potential customer based on predefined criteria once the customer provides his/her consent. Through this process, we are generating quality leads to Bank/Multi-finances/Fintech while protecting our customer right and privacy.

5. Big Social

Big Social is a platform application on premise to measure the right analysis related to trends, brands, social issues; politics and economics, personal brands, and more on social media and online media more easily and effectively presented in one dashboard.

6. Smart Eye

Smart Eye is a virtual reality-based technology. Smart Eye helps companies create virtual tour platforms and 360 live streaming providers to provide users with a different experience by making users feel they are in that location.

Cooperation Opportunity

Since customer both internally telkom and external (government and enterprise business) are very demanding for making an insight and a recommendation generated by big data analytics in order to create an incremental value to be more effective and efficient therefore Telkom

Group is open to collaborate with global companies to develop comprehensive product and solution for Indonesia' market. Telkom Group is also willing to explore in people capabilities of big data technologies.

Focus Area: Automation

Global Situation

Autonomous robot and vehicles are already bringing innovation and delivering significant value. Autonomous Vehicles can provide convenience in various sectors such as Improve speed and accuracy of routine operations, particularly in warehousing and manufacturing, add efficiency through side-by-side work with humans and Reduce the risk of employee injury in dangerous environments. On the long run it can reduce accident rates and environmentally friendly.

In December 2018, Waymo, the company that emerged from Google's self-driving-car project, officially started its commercial self-driving-car service in the suburbs of Phoenix. Smaller startups like May Mobility and Drive.ai are running small-scale but revenue-generating shuttle services.

Amazon, as the biggest e-commerce site in the US, launched Amazon Prime Air service, a future delivery system from Amazon designed to safely get packages to customers in 30 minutes or less using unmanned aerial vehicles, also called drones. Alibaba and JD in China, also Rakuten in Japan also developing same solution to bring new experience for their customers, to get better service in commerce.

Every significant automaker is pursuing the tech, eager to rebrand and rebuild itself as a "mobility provider" before the idea of car ownership goes kaput. Ride-hailing companies like Lyft and Uber are hustling to dismiss the profit-gobbling human drivers who now shuttle their users about. Tech giants like Apple, IBM, and Intel are looking to carve off their slice of the pie. Countless hungry startups have materialized to fill niches in a burgeoning ecosystem, focusing on laser sensors, compressing mapping data, setting up service centers, and more.

Indonesia Situation

Yogyakarta based start-up Frogs Indonesia carried out test flights of its second generation of airborne electric taxis called the Frogs 282 at Gading Airport in Gunungkidul regency on Saturday. The electric taxi floated a few centimeters above the ground during a series of trials on Saturday, after which some technicians landed the prototype to examine it.

To revitalize the manufacturing industry, Indonesia is committed to accelerating the implementation of the Industrial Revolution 4.0. The "Making Indonesia 4.0" initiative provides

great potential to double labor productivity, thereby increasing global competitiveness and lifting global export market share.

1. Indonesia will focus on five sectors:
 - a. Food and drink;
 - b. Textiles and clothing;
 - c. Automotive;
 - d. Chemistry;
 - e. Electronics.
2. Utilization of technologies such as automatic monitoring systems and autopilot drones will be optimized to support this program. Indonesia is committed to implementing Making Indonesia 4.0 and making it a national agenda.

Telkom Group Capabilities

Telkom has helped a few corporate customers to do business process reformation, from conventional working process to automation process, to increase productivity and efficiency of those company. Example of Telkom Group capabilities in automation includes:

1. Having Research lab for UAV (Unmanned Aerial Vehicle)
2. Survey and mapping on TransJawa toll road using UAV
3. BTS tower monitoring using UAV
4. Mapping and photogrammetry in palm oil plantation area and crop field.

Cooperation Opportunity

Due to the large business opportunities and to grab new revenue from customers in automation, Telkom Group is open to collaborate with other companies all over the world in terms of funding for research and implementation of automation (car & drone) in Indonesia.

Focus Area: Digital Connectivity 5G

Global Situation

Now, as 5G takes center stage in the developing world, emerging markets have been making a concerted effort to prepare for the transition to the next-generation network. 5G will serve as the backbone of the fourth industrial revolution, and the global pacesetter for the new standard could become the same for connected technologies. All told, 5G technologies are expected to contribute \$2.2 trillion to the global economy over the next 15 years.

Three leading countries at 5G are United State, South Korea and China. The United States is replicating the private-sector-led strategy it rode to 4G dominance to continue its leadership into the 5G era. This approach provides operators with autonomy over their own deployment strategies and methods, which fuels competition and ultimately drives innovation and

investment as a result. South Korea was the second country in the world to deploy a 5G network, and it's on track to become the global leader in 5G penetration. Its speedy 5G deployment is the result of its government taking a hands-on approach in regulating the telecoms industry. China is the largest mobile market in the world and is expected to become the biggest 5G market by connections by 2025. China's three state-owned network operators are ramping up trials and tests to meet the country's launch target for the first phase of commercial 5G services later this year.

Indonesia Situation

Currently 5G technology is ready to be implemented in Indonesia, but it is still limited to the Industrial sector. 5G technology opens new opportunities for the industrial sector in Indonesia with high throughput capability and low latency connections, enabling connectivity between devices, machines, sensors, vehicles and other objects through wireless technology.

Telkomsel as one of the cellular operators and network provider in Indonesia has conducted trials in the industrial sector by presenting several usecases like 5G Call, Smart air patrol using drones, immersive collaboration, seamless gaming and smart surveillance. There are 3 sectors that are suitable to implement 5G technology, like the manufacturing industry sector, the agricultural sector, and the logistics sector.

Telkom Group Capabilities

In 2020 – 2024, Telkomsel as a subsidiary of Telkom Group's that running on Cellular business will continue to invest to maintain its leadership in digital cellular market for facility modernization, digital telco infrastructure, and smart resource management and operation.

Facility Modernization:

1. Modernize 32 Telkomsel DC becoming Tier-III or Tier-II DC to support its private cloud plan and enterprise business
2. Develop another 10 Edge DC for deeper enterprise solution

Digital Telco Infrastructure (2020 – 2024):

1. Delivering 27K 5G sites
2. Continue to expand 4G capacity and 3G re-farming
3. Core network virtualization and hybrid cloud
4. Private network and enterprise cloud

Starting Cloud Orchestration, Cyber Security and Smart Resource Management:

1. Big data analytic and AI/ML to improve customer experience, internal inventory, etc.
2. Cyber Security to anticipate global cyber threats
3. OSS/BSS to manage more than 300K network elements
4. B2B solutions for targeted 66 enterprises

Cooperation Opportunity

Since the grow of data video, voice and streaming getting bigger in Indonesia, there are a needs to expand the capability of carrier network. 5G latest technology been implement in some part of the world to enhance the network capability.

So customer can be satisfied with the connection and we need to collaborate with UAE to building together 5G capability in all cities of Indonesia.

QUESTION NO. 4

What types of partnerships and cooperation are you looking for and where would you like to see the UAE join in Indonesia's success model?

Answer:

There are several options of partnership or cooperation related to investment:

1. Investment in Digital Startups of Indonesia and / or ASEAN

Telkom Group has a venture capital (MDI, PT. Metra Digital Investama), one of the biggest VC in the region that has already invested in around 40 digital startups (series-A, series-B, series-C, until pre-IPO). Many are synergistic with Telkom Group. MDI has executed 7 successful exits by 2019, with money multiple above industry average. Investment fund-commitment from Telkom has been around USD 100 million (2016-2019) and now in the process of rising additional commitment toward USD 300-600 millions.

There is investment opportunity that MDI can manage fund from investors from outside of the region that has limited knowledge on investing in digital startups in Indonesia and / or ASEAN. In addition to managing Telkom Funds, currently, MDI is also active in managing fund from other investors (Singapore, Korea, Indonesia's state own enterprise, etc.). MDI position itself as GP (general partner) or co-GP, and investors as LP (limited partner) or co-LP.

Partnership model options are either as GP-LP model or Co-GP (MDI with Investors) plus external LP's. Not only as investors, together with MDI and Telkom Group, the partners can also leverage synergy, supporting the digital startups to transform to the next level. For example, the investor can help digital startups to penetrate middle east market.

2. Strategic Investment in Core Business of Telkom and / or Adjacent Business

Given a vast growth opportunity in Indonesia, Telkom has plans to invest heavily in the upcoming years both in its core-business, as well as in adjacent businesses. Core businesses include Infrastructure Company (InfraCo)/5G, Satellite Biz, Digital Company (DigiCo), Data Center/Cloud/Digital-Platform, Global-Digital-Hub, ICT Managed-Services. Whereas adjacent businesses include smart-properties, submarine cable-ships, business process outsourcing, shared service operation, ICT-related power company, and certain digital-services.

In order to ease the interest and debt repayment, Telkom may raise bonds, global bonds, or other long term financing instrument for investors to invest.

In addition to bond model, other smart financing and/or partnership can also be considered as case by case basis. In certain segments, what Telkom needs is not only financial support but also competency or new capability especially in adjacent business.

Given the submarine-cable, satellite assets, and other international assets, we are also open to other options of partnership, especially with those that can assist us opening new markets and opportunity in ASEAN, MENA, Sout Asia, and global market.

QUESTION NO. 5

Where will Telkom see the most growth in the next 3-to-5 years; What are the biggest challenges?

Answer:

1. What are the most growth?

- a. Amidst the acceleration of world's digital economy, Indonesia is one of countries that has notable potential growth, whereas currently the penetration of mobile broadband has reached 82% of population, while fixed broadband penetration at 14% and still has room for growth. Mobile and fixed broadband penetration respectively ranked at 5 and 6 out of 9 South East Asia countries.

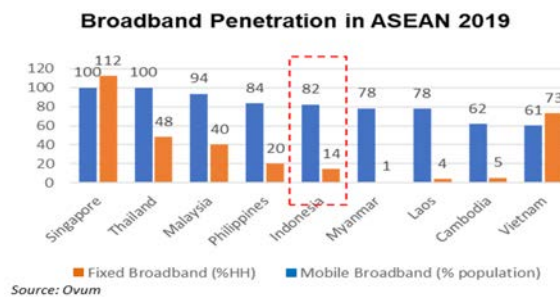


Fig 5.1: Fixed Broadband Penetration

- b. Government set 5 key agenda "Indonesia Maju" vision, including human capital development, infrastructure development and economy transformation. These agendas are to realize national prosperity and competitiveness
- c. Telkom is in the front position to support those agenda by building digital infrastructure: broadband connectivity, platform and services on top, that is affordable & accessible to all as the most growth in the next 3-5 years

2. What are the biggest challenges?

- a. Despite Telkom as the market leader of those broadband services, fulfilling the broadband demand is still challenging. In mobile broadband, competition is becoming fiercer (low RpMB), while in fixed broadband future penetration rate will expand into rural area with lower purchasing power (affordability). Those issues are challenging for industry healthiness & business profitability.

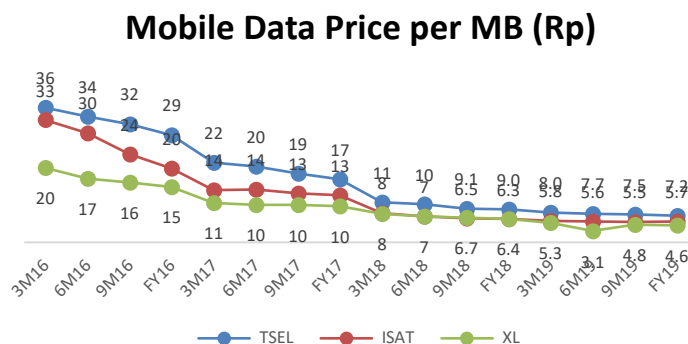


Fig 5.2: Mobile Broadband Price Competition

Home BB Demand Curve² – 2023

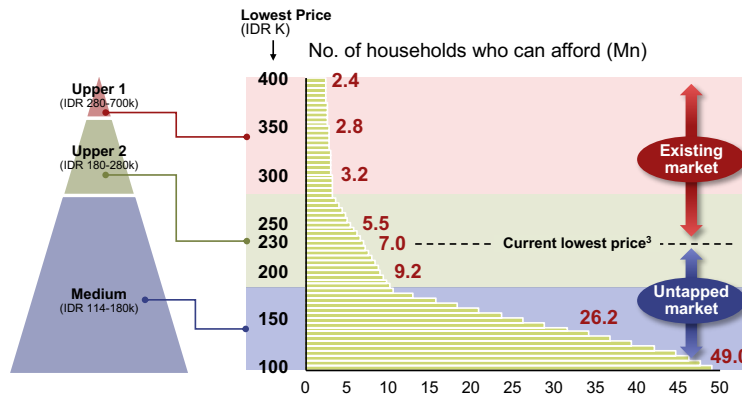


Fig 5.3: Fixed Broadband Affordability Price

- b. Our future challenges are how to realize national prosperity and competitiveness through accelerating digital infrastructure, platforms, and digital service development. Telkom development focus on enhancing sustainable digital infrastructure and platforms that are affordable and accessible to all, as well as nurturing best-in-class digital talent that helps develop nation’s digital capabilities.
- c. Telkom is also looking for global partner whose expertise can fulfill the gap needed for Telkom to enhance its capability, especially in Digital Platform and Digital Service businesses.
- d. Digital adoption is a challenge due to its importance for digital business industry growth in which Telkom has a role to support digital economy development.

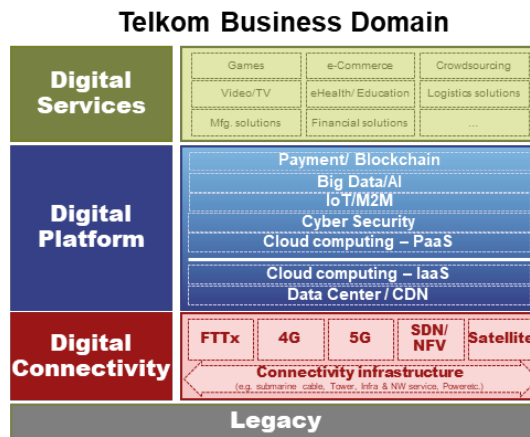


Fig 5.4: Telkom Business Domain

QUESTION NO. 6

How important is it for you as an Indonesian to promote your incredible history, your credentials to let the UAE and the world know, that a company like Telkom, is open for global partners to add value here in the country?

Answer:

- For Telkom, partnership is one of strategy for growth. Therefore, Telkom has partnered with other global parties. Historically, Telkom has been in a long-term partnership with Singtel in developing Indonesia mobile market through Telkomsel since 2001. We also have been a partner with Telstra through a joint-venture company, TelkomTelstra, in capturing IT professional services, cloud and security market in Indonesia since 2014. These partnerships involved transfer of technology, board and management participation, and efficient investments to increase our capabilities.
- Indonesia has large customer base and also the largest ICT services market in South East Asia. As a market leader in Indonesia, Telkom has aggregated demand from enterprise and government for ICT, digital platforms and digital services, especially by extending and bundling with the digital connectivity services.
- Telkom has an ambition to become the market leader on ICT/digital service, initially in Indonesia and subsequently in the broader Southeast Asia. Telkom will build national digital platform capabilities, partner with global platform-agnostic digital service players, prioritize solution area starting with State Owned Enterprise (SOE) solution (i.e. industrial IoT solutions, transport & logistic solutions, digital customer experience management, and subsidy delivery solutions) and expand into other regional markets after strong local presence in Indonesia. However, currently there is no leading ICT/Digital services provider with worldwide reputation in this region.
- To realize the ambition as the market leader on ICT/digital service, Telkom need to build in-depth capability, therefore Telkom will seek reputable partners that are champions in ICT/digital services.

QUESTION NO. 7

“The World’s Greatest Show,” Expo 2020 Dubai will host 190 countries for 173 days and Indonesia will have a pavilion 2,000 square meters over three levels highlighting a time to collaborate. Final messages to global investors and the 25 million people that will visit The World Expo 2020 about investing in Indonesia and cooperating with Telkom to promote innovation, capture new opportunities, and increase productivity in a more digitized world.

Answer:

1. Why Invest in Indonesia?

a. Encouraging Macro Economic Condition and Stable Political Situation

Indonesia is expected to become one of the largest economies in the world with secure and stable economy, and reformist political condition. Indonesia rated at Baa2 (Stable) by Moody’s, BBB (Stable) by S&P, and BBB (Stable) by Fitch. The country ranks 16 of 193 countries based on 2019 International Monetary Fund’s Largest Economy by GDP in the World. Standard Chartered forecast it will become number 4 by 2030. The country also ranks 50 of 140 countries in 2019 World Economic Forum’s Global Competitiveness Index. Indonesia is also progressing in World Bank’s Ease of Doing Business, from the rank of 120 in 2015, to 73 of 190 countries in 2020.

In the past ten years, Indonesia has experienced a sustain GDP growth of above 5% amid the 3% global economic growth. Based on Indonesia Ministry of Finance, the country has GDP growth on average throughout 2010-2018. Indonesia’s GDP also projected to grow by 5.0-5.2% in 2020-2023 by Economist Intelligence Unit. In the beginning of 2020, World Bank reported that Indonesia has growing middle-class segment, with 20% of Indonesians are within the category and now represents close to half of all household consumption in Indonesia with annual consumption growth of 12% since 2012. Based on Indonesia Central Bureau of Statistics, Indonesian households’ consumption also contribute to around than 57% Indonesia’s GDP.

Further, foreign direct investments (FDI) keep coming into Indonesia. Latest number shows that in the fourth quarter of 2019, FDI increased 6.4 percent year-on-year to IDR 105.3 trillion, or USD 7 billion, following a 17.8 percent jump in the previous three-month period. During 2014 to 2019, the FDI in Indonesia worth of more than USD 170 billion.

On the political front, Indonesia has adopted democratization since 1999. Since then Indonesia has had five smooth and peaceful direct elections. On the latest one, President Joko Widodo won for his second term. In the next five years, President Joko Widodo will be focusing on five priorities:

- 1) Human capital development especially in IT,
- 2) Continuing infrastructure development to connect production and distribution areas,
- 3) Simplification of regulations through Omnibus Law in Employment Creation and SME Empowerment,
- 4) Simplification of bureaucracy to support easiness of investment, and
- 5) Economic transformation to increase manufacturing and service sectors competitiveness.

b. Growing Digital Economy

Recently at the Microsoft Digital Economy Summit in Jakarta, President Joko Widodo stated that digital economy was one of the promising investment sectors in Indonesia. In fact, Indonesia is the fastest-growing and largest digital economy in Asia. In 2015, Indonesia's digital economy was worth USD8 billion, and by 2019 it had gone up to USD40 billion. In 2025, the value is predicted to reach USD133 billion.

Currently, Indonesia is the home of 1 decacorn out of 3 South East Asia's decacorns. Indonesia is also the base of 4 unicorns out of 10 unicorns in South East Asia.

President Joko Widodo also stated that Indonesia was the number five most active startup ecosystem in the world after the US, India, the UK and Canada. Startup companies have been driving digital economy growth in Indonesia, as it has more than 2,000 startups. This makes Indonesia as the largest digital economic potential market in Southeast Asia.

Further, there are around 150 million of active internet users and 106 million of social media users (source: e-Conomy South East Asia 2019 issued by Temasek, Google and Bain).

Currently the Government provides opportunities for investors to participate in promoting the digital sector in Indonesia, where the digital industry sectors such as e-commerce, web portals, etc. become more open to foreign investment.

2. Why Invest in Telkom?

a. Telkom is attractive in many perspectives

- 1) Telkom is **the only integrated telco and ICT solution provider in Indonesia** which is well positioned to provide various telco, ICT, and digital solutions to government institutions, corporates, SMEs, as well as to retail consumers.
- 2) Telkom is **one of the most compelling Indonesian company to invest in**. Given the healthy growth projection particularly on the back of growing mobile and fixed broadband businesses with potentials in future digital businesses growth of digital services and digital platforms.
- 3) From 2019-2024, **Telkom's revenue growth is expected to increase at around 6% per annum (CAGR)**, on the back of growing digital platform and digital service businesses. EBITDA margin is projected to hover around 48% amidst declining legacy businesses.
- 4) Our businesses, given their defensive nature, are also **relatively immune to any global and domestic adverse situation**.
- 5) Based on McKinsey, in 2015-2019, Telkom has provided **total return to shareholders** of 11% (CAGR) far above that of Asia Pacific telcos of 5% (CAGR).

b. Telkom has strong position in all of its business segments supported by unparalleled infrastructures

1) Mobile Business

- a) The number of Telkom's mobile subscribers was more than 171 million at end of 2019, resulting in **market share domination to more than 60% of mobile broadband**.
 - b) With such huge customer base we believe **Mobile Digital Business**, both in mobile data and digital services (comprising: video, games, music, and payment) will grow largely. We are the only cellular operator who provides end-to-end digital service. In 2019, digital service grew by 29% YoY and is expected to continue growing at the same rate around 30% in 2020. Based on A.T. Kearney's study, Indonesian market of mobile data itself was around IDR 84 trillion and is expected to keep growing and reach IDR 175 trillion in 2024.
 - c) The potential is also supported by current **low smartphone penetration rate**. In 2019 our customers' smartphone penetration was 70%, a significant growth from 55% in 2017. We believe it will further increase given growing middle class segment and cheaper smartphone price.
 - d) Besides, **mobile data consumption is still relatively low**. Our average data consumption is around 5 GB per user per month which is still lower than that of Thailand and India of more than 10 GB (Source: GSMA).
 - e) Mobile data pricing in Indonesia is also still relatively low. As per its report in September 2019, McKinsey highlighted that mobile data pricing in Indonesia was the 4th of cheapest in the world. With the right pricing strategy and better competition environment, data monetization might happen in foreseeable future.
 - f) **Potential growth of variety digital businesses.**
Digital Services have been the key driver of Telkomsel's transformation to become a Digital Telco company with a number of investments and key initiatives have been established to accelerate the growth of Digital Services, with key products and services in this segment included Digital Lifestyle, Mobile Financial Services, Digital Advertising, Digital Mobile Banking and Internet of Things (IoT).
- With an increasing of smartphone penetration as well as healthy growth in Data payload, which more than 50% YoY, Digital Services grew strongly and potentially to increase its contribution to total revenue to more than 10% from a single digit as of now.
- g) **Large Digital Gaming Potential.** Indonesia is one of the largest gaming markets in Asia. Based on Newzoo (gaming and e-sport analytics), game players in Indonesia spent a total of USD1.1 Billion on games in 2019 making it one of the biggest games market in South-East Asia. Given its superior infrastructure, Telkomsel is well-positioned to cater Indonesian gamers' need of low latency. According to Statista, mobile game users in Indonesia is around 48 million users in 2020.
 - h) **Ability to manage the legacy decline.** With customers' changing behaviour, transition from legacy to data is inevitable. Nevertheless, we have been successfully managing legacy to decline gradually with limited impact to mobile service EBITDA margins at around 50%.

- i) **Upcoming 5G Implementation.** Unlike some neighboring countries, Indonesia has yet to start adopting 5G. As a late adopter, however, we will get the benefit of advanced technology, cheaper equipment price, and learn from others' experiences at the time we implement 5G.
- j) The contribution of mobile business to Telkom revenue was around 64% in 2019.

2) Fixed Broadband Business

- a) In fixed broadband business, Telkom has more than 7 million customers. With this, Telkom's fixed broadband product which is called IndiHome controlled **market share of more than 85%**. Telkom is able to reach this achievement only 5 years after IndiHome had been launched in early 2015. Our service covers across Indonesia supported by our nationwide network infrastructures and human resources. This year, we plan to add 1.3 million of additional subscribers.
- b) **The competition in this business is relatively benign.** Other players only focus on several selected cities. Competitors in the business also have been relatively slow in growing their networks particularly in smaller cities, partly due to their limited resources. This allows Telkom to maintain leading fixed broadband provider position across Indonesia.
- c) **Low fixed broadband penetration.** Indonesia has around 63 million households based on Bappenas in 2017, with projected annual growth of around 700 thousand households according to BPS. We estimate that in 2023, there would be around 9-10 million upper-class market that would have been well-penetrated. On the other hand in the same year, we estimate there would be around 60 million low-to-middle class households that would still be under-penetrated.
- d) To **tap into the low-to-middle households**, we recently launched IndiHome Lite, which offers more attractive pricing plan with adjusted benefits.
- e) **Profitability keep increasing towards global benchmark** of EBITDA Margin of 35% which we aim to reach in 2021. Currently our fixed broadband's EBITDA margin is around 32%, rapidly growing from around 24% in 2017 and 28% in 2018 as a result of improving operating leverage.
- f) The contribution of fixed broadband business to Telkom revenue was around 13% in 2019.

3) Enterprise Business

- a) The opportunity in Enterprise solutions is increasing since the business process digitalization trend is also rising. Indonesia's corporates, government institutions, and SMEs are still in the early stage of the digitalization era. There are various opportunities for digitalization across sectors e.g healthcare,

finance and insurance, government administration, transportation-logistics, education, retail, and manufacturing.

- b) **Telkom is in the leading position to serve the need in Enterprise solutions.** Telkom has end-to-end digital connectivity and digital platform such as: data center, cloud, IoT and cyber security. We estimate Indonesian Enterprise ICT market is around IDR236 trillion to IDR410 trillion in 2024 which came from enterprise data, IT services, data center and cloud, as well as device and hardware.
- c) Telkom has **22 Data Centers** (more than 100 thousand sqm, 5 are overseas) and is in progress of building 1 additional data center in outskirts Jakarta. A.T. Kearney is projecting that the market size of Indonesian data center, cloud, and cyber security to grow by 12%, 22%, and 16% respectively (CAGR 2019-2024). With increasing digital needs, we believe the need of data center among Indonesian enterprise and government institutions will increase. This service is also attracting global players i.e NTT, Google, Amazon, and Alibaba to develop their data centers in the country. However, Telkom has unique position in this business with niche market in government institutions and SOEs, beside our strong position in core connectivity service.
- d) Telkom will be **building national digital platform** as the foundation of services and solutions portfolio. Telkom will also partner with global digital service players to accelerate operating model transformation and capability building. Based on A.T. Kearney study, the market size of digital platform was around IDR50 trillion in 2019 and is expected to reach IDR90 trillion in 2024 with CAGR of growth rate of 12%.
- e) The contribution of enterprise business to Telkom revenue was around 15% in 2019.

4) Unparalleled infrastructure

- a) Telkom has been building **215 modern broadband cities, out of a total 458 district capitals**, in which all backbone and access infrastructures have been fiberized.
- b) Today, Telkom has a **vast infrastructure across Indonesia** comprises of 164.8 thousand km of fiber optic cables including international submarine cable SEAMEWE-5 (South East Asia Middle East Western Europe-5) to Europe and SEA-US (South East Asia-US) to America which connected by International Global Gateway across Indonesia. These infrastructures connected and interoperated with 56 points of presence (56 domestic and 64 international); 212.2 thousand base transceiver stations (BTS); 33.9 thousand telecommunication towers; and 3 satellites in operation with 133 transponder equivalent (TPE).

5) Digital Services

- a) **Together with digital platform, digital services will be our next engine of growth.** Indonesia is an enticing digital market which attracting global large players and investors to participate in digital services market. Based on A.T.

Kearney study, the market size of digital services was around IDR120 trillion in 2019 and is expected to reach IDR195 trillion in 2024 with CAGR of growth rate of 10%.

- b) The size of Indonesian consumer digital market, according to A.T. Kearney, was around IDR90 trillion in 2018 and is expected to reach IDR173 trillion by 2024.
- c) **Telkom will add US\$ 300-600 millions into its CVC called MDI (Metra Digital Investama) which have been successfully managing US\$ 100 million since 2016.** MDI has invested in 40 startups globally, including Kredivo, Geniee from Japan, and Whispir Australia. Moreover, Telkom has developed almost 90 startups, locally and within the company itself.
- d) Telkom will enhance its existing mobile customer digital touch point: MyTelkomsel to become a **super app** to capture opportunities in gaming, home shopping, as well as education, health, and financial technology.

In summary, with the increasing trend of digital adoption across various customer segments, Indonesia provides opportunities for investors to participate in the digital industry.

Telkom is one of the most compelling Indonesian companies to invest in. Given its healthy growth projection particularly on the back of growing mobile and fixed broadband businesses, and potential future growth in digital platforms and digital services.