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# Indonesia ICT sector assessment, outlook

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Information and communications technology (ICT) connectivity in Indonesia as a growing economy faces huge challenges in preparing for the future.

The world's largest archipelago consisting of more than 17,500 islands with a population of nearly 250 million requires substantial investments in domestic ICT infrastructure and international connectivity to meet the strong growing demand from the private and public sectors.

New technologies require an ICT infrastructure with sufficient capacity. Reliable interconnection with other ASEAN member countries to remain competitive in the interconnected world is another aspect of why ICT should be considered a priority sector.

In October 2014 the Indonesian government unveiled a Rp 278 trillion broadband connectivity plan in order to boost economic growth. The plan defines broadband development in Indonesia and sets the strategy and major milestones for the coming five years.

The main purposes of broadband development are to encourage economic growth and increase the competitiveness of the nation, to support the improvement of human development and to safeguard the sovereignty of the nation.

The Networked Readiness Index (NRI) 2015, published by the World Economic Forum, includes 143 countries and measures the propensity for the countries to exploit the opportunities offered by information and communications technology.

The NRI considers several indicators, such as the political and regulatory environment, the business and innovation environment, infrastructure and digital content, affordability, skills, individual usage, business usage, government usage, economic impacts and social impact.

In the last assessment in 2014, in which 146 countries were covered, Indonesia dropped 15 places to 79th, while Singapore claimed first, Australia 16th, Malaysia 32nd, China 62nd, Thailand 67th, the Philippines 76th, Vietnam 85th, Lao PDR 97th, Cambodia, Timor-Leste 134th and Myanmar 139th.

To attract local and foreign investments a more business friendly environment is required in Indonesia. The business society in particular is demanding a fight against corruption, the cutting of red tape, infrastructure development and the improvement of the tax system. The same applies, of course, for the Indonesian ICT sector.

To meet the requirements and keep pace with international developments, including connectivity to other ASEAN member countries, the broadband connectivity plan, which describes the path to the right direction, should be implemented in the given timeframe. Further considerations, recommendations and implications related to ICT development in Indonesia are pointed out in the following:

As addressed in the broadband connectivity plan, educational and training skills, including English language skills, should be enhanced by connecting schools to the Internet and implementing e-Education and e-Learning programs. Competence centers consisting of experts from academia and the private sector should be established to boost research and development (R&D) in Indonesia.

World Bank data shows that Indonesia spent the equivalent of 0.07 percent of its gross domestic product (GDP) on R&D in 2010. Meanwhile, Malaysia spent 0.63 percent, Singapore 2.2 percent and Thailand 0.25 percent in the same period.

For a modern technology infrastructure, state-of-the-art data centers for public use (e.g. national and international telecommunications operators and companies) are required in major cities and business centers, taking into consideration environmental risks (e.g. earthquakes, floods, landslides and volcanos), redundancy aspects (backups and disaster recovery), security (access, surveillance and stable power) and professional operations.

Cross-sector infrastructure sharing reduces costs. Ducts, towers, masts, power grids, facilities, etc. can be shared between the telecommunications, the energy and the transportation sectors.

For public-private partnership (PPP) opportunities identify and classify infrastructure development and new public service provisions that will improve ICT usage and convergence in Indonesia (e.g. increased Internet penetration, improved mobile services, improved opportunities for convergence, content development, etc.).

Beside manufacturing of ICT products, promoting niche markets or new technologies and trends like mobile applications, IT outsourcing, hosting services, enterprise private clouds, 4G/5G, Internet of Things (IoT), Machine to Machine (M2M) communications, Green ICT, Call Centers, etc. shall be considered.

International development and trends in the ICT sector should be observed to ensure harmonization of policies and regulations including cross-sector regulation.

For international connectivity, Indonesia is depending on international submarine cables, most of them currently routed via Singaporean and Malaysian waters. New submarine cables with diverse routes are planned for the coming years. For example, the Southeast Asia-US submarine cable will connect Manado in Indonesia as the new eastern Indonesian gateway and Davao in the southern Philippines via Guam to the United States' west coast.

When completed in 2017 at an approximate cost of US\$250 million, the approximately 15,000-kilometer cable system will provide an additional 20 terabits per second (tbps) capacity, connecting Indonesia and the Philippines to the US with state-of-the-art 100G technology.

Redundancy and diverse routing of submarine cables is important to protect connectivity against terrorist attacks, sabotage and cable cuts by natural disasters such as seaquakes or by anchors.

The announcement of the Indonesian government for the formation of the National Cyber Agency (NCA) is a step in the right direction. With regard to cyber-attacks, Indonesia is ranked as one of the world's top three targets. The NCA should develop and implement strategies for the defense against rising cyber-attacks to protect Internet users, the

government, financial services institutions and other businesses, including sensitive sectors like the transportation and the energy sectors.

Strengthening the awareness of the public about privacy and cybercrime committed through e-mail scams, SMS or social media should be another focus area of the NCA.

On behalf of consumers, the government of Indonesia shall ensure that the service quality of telecommunications operators improves and minimum international accepted quality of service (QoS) standards shall be enforced and regular monitored for all segments (fixed, mobile, Internet and broadcasting services). With currently more than 280 million SIM cards issued to users, mobile is the main access to the Internet.

“Last mile” and campus/in-house cabling are very often bottlenecks for high speed landline data connections. Even if the fiber optic backbones of the telecommunications operators allow high speed data, cable connections between the exchanges of the operators and campuses or buildings (“the last mile”) of the consumers are often old and faulty copper cables that do not allow high speed data transfer. The telecommunications cabling on campuses and in buildings (“in-house cabling”) is mostly the sole responsibility of the landlords.

With its young population, Indonesia has a market potential of about 250 million consumers. Taking the right measures, considering the actual international development and best practice experiences in the global ICT sector, Indonesia has a realistic chance to strengthen its national ICT sector in the coming years and so play an equal role in the very competitive Asian and global markets.

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