Artificial Intelligence in South East Asia: Upskilling and Reskilling to Narrow Emerging Digital Divides in the Post-Pandemic Recovery

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Introduction

Southeast Asia has become a growing digital hub, home to a burgeoning sector of tech startups and smartphone super apps dedicated to e-commerce, messaging, digital payments, ridesharing, and food delivery. The COVID-19 pandemic has only accelerated the trend of digitization in the region. Governments in the Association of Southeast Asian Nations (ASEAN) region have emphasized the importance of developing and using digital technologies, including artificial intelligence. The ASEAN region, however, is very diverse and has seen uneven and unequal development of digital access. Three key gaps hinder further development of the digital economy and economic growth post-pandemic. These include gaps in digital use and connectivity between urban and rural communities, between large and small businesses and enterprises, and between men and women. To close these gaps, ASEAN and its members should ramp up efforts to upskill disadvantaged groups and areas, increase government investment, and deepen coordination among public, private, and nonprofit sectors.

Southeast Asia, One of the Fastest Growing Digital Economies in the World

Southeast Asia is one of the fastest growing digital economies in the world. The number of digital consumers in Southeast Asia nearly tripled between 2015 and 2018, growing from 90 million in 2015 to 250 million in 2018 to more than 300 million by the end of 2020.[1] The COVID-19 pandemic has accelerated this trend. According to recent estimates, the acceleration in digital consumer growth supposed to occur between 2020 and 2025 took place in

[1] Google, Temasek, and Bain & Company, "E-Conomy SEA 2020 Report," Google, accessed May 6, 2021, https://storage.googleapis.com/gweb-economy-sea.appspot.com/assets/pdf/e-Conomy_SEA_2020_Report.pdf.

only one year, as individuals, consumers, and companies continue to move activities online.[2]

The ASEAN region contains a wide variety of levels of economic development, cultures, languages, and religions.[3] Every ASEAN country, however, has felt the effects of the digital economy. Some countries, like Singapore, are global innovation leaders and considerably more tech-advanced than others in the region. Yet even less tech-advanced ASEAN member states are witnessing the emergence of their own tech hot spots driven by a growing number of tech-savvy young and well-educated entrepreneurs. The process of economic integration across the ten ASEAN member states and their dialogue partners in East Asia—Japan, China, and Korea—and the Pacific—including Australia and New Zealand—can benefit this cohort of young and dynamic tech entrepreneurs.[4]

Increased adoption and usage of digital technologies in the region is developing hand-in-hand with the emergence of regional digital champions and so-called "super apps." Brands such as regional ridesharing and food delivery super apps Grab and Go-Jek, regional e-commerce giants Tokopedia and Lazada, online travel booking agent Traveloka, and Indonesian e-commerce platform Bukalapak—which services small and medium enterprises—are as widespread and well-known in Southeast Asia as their peers in China or the West. These companies are making extensive usage of artificial intelligence (AI) and related techniques to innovate and improve their services for growing generations of ASEAN millennials and Generation Z consumers.

ASEAN Governments Strategies and Policies around AI

Many ASEAN governments are becoming increasingly aware of the importance of developing AI strategies and initiatives to promote benefits, mitigate risks, and narrow the emerging divides associated with new technologies. Recent policy initiatives and strategies emphasize upskilling and reskilling as key pillars for a transition towards inclusive digital economies.

In November 2019, Singapore launched its National Artificial Intelligence Strategy, with the vision of becoming a leading global AI player by 2030. This strategy is cross-cutting, with key pillars related to ecosystem and skills development. The largest country in the region, Indonesia, released its national AI strategy in mid-2020. The strategy emphasizes the benefits of AI for health services, transportation, urban development and smart cities, the public sector, education, and food security. Digital connectivity is especially key for Indonesia, a country spread out over thousands of islands with uneven access to

[2] Facebook and Bain & Company, "Digital Consumers of Tomorrow, Here Today: A Sync Southeast Asia Report," Bain & Company, August 6, 2020, https://www.bain.com/globalassets/noindex/2020/facebook_and_bain_and_company_report_digital_consumers_of_tomorrow_here_today.pdf.
[3] The Association of Southeast Asian Nations is a regional block with a common agenda for socio-economic development comprising ten countries in South East Asia: Brunei Darussalam, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Vietnam.
[4] These fifteen countries have signed in November 2020 the mega multilateral trade agreement known as the Regional Comprehensive Economic Partnership (RCEP).

digital technology. The Indonesian strategy emphasizes the importance of ethics, skills, infrastructure, and data analytics as key components of a well-functioning AI ecosystem. For the development and implementation of any AI-related policy, the strategy also highlights the importance of multi-stakeholder involvement from the government, the business sector, educational institutions, and local communities.

In addition to Indonesia and Singapore, countries such as Malaysia and Thailand see AI and digital technologies as an opportunity to modernize traditional sectors to make them more innovative and productive. For example, new technologies can power drones and sensors to assist farmers with monitoring fields and crops in rural areas, deliver telemedicine to smaller islands and remote locations, provide digital banking for unbanked populations, or monitor and protect the rich biodiversity of the region and its cultural heritage. In Malaysia, the Ministry of International Trade and Industry and the Center of Artificial Intelligence for Future Industry are working together to promote the development of an AI ecosystem, targeting the banking, manufacturing, education, and healthcare sectors. Local universities and research institutes are investing in AI-related research and training. In Thailand, interesting AI developments are emerging in the healthcare sector, like Vaja, a Thai language speech recognition technology used in more than seventy Thai hospitals.

At the regional level, several ASEAN-wide master plans and strategic initiatives have been established with the aim of further developing and integrating the digital economy of the region. These strategies emphasize digital connectivity and infrastructure, skills development, the realization of smart cities, the transition towards Industry 4.0, and generally how digital technologies, including AI, can be effectively leveraged to "build back better" during the post-pandemic recovery.

Emerging "Digital Divides" and Skills Development

Although ASEAN governments have taken steps to foster the digital economy, key gaps still exist that hinder innovation and expose social inequities. One of the consequences of the fast technology and economic developments in the region is the emergence of three digital "divides": between rural and urban areas, firms of different sizes, and men and women. These divides are slowing down innovation and delaying adoption of digital technologies, including AI, evenly across communities. The way different groups of individuals and firms will be able to acquire the skills necessary to use digital technologies in general—and AI in particular—will be critical in mitigating and addressing these emerging divides.

The first divide is the geographic divide between urban places with high digital connectivity and less connected rural areas. Southeast Asia combines hyper-connected mega cities with remote rural areas where internet connection is barely present. For example, in Indonesia, the largest country in the region, there is a yawning gap in access to a reliable and stable internet connection between the most populous island Java, where the capital city Jakarta is located, and the myriad of smaller islands in the eastern part

of the country towards the Pacific.

The second divide is between large firms and domestic micro-, small and medium-sized enterprises (MSMEs). While usage of AI or machine learning tools is on the rise, it is not yet ubiquitous across most ASEAN companies and organizations, including MSMEs. For example, recent estimates by leading consultancy firms show potential for significant economic gains from increased investments in AI. The awareness of the potential of AI technology is growing rapidly in the business sector. According to a recent McKinsey report, in 2011, only 6 percent of large firms mentioned terms such as big data, AI, machine learning, Internet of Things, or advanced analytics in their annual reports, compared to more than 30 percent in 2016.[5] While large local digital champions have successfully embraced emerging technology, however, the vast majority of ASEAN MSMEs—which represent between 97 and 99 percent of firms and between 60 and 80 percent of total employment across ASEAN—still use very basic digital technologies and tools, if any.[6] ASEAN MSMEs often lack the skills and the tools necessary to adopt AI and digital technologies in their business models and daily activities.

The third digital divide is the gender divide. Southeast Asia compares relatively favorably in terms of basic equal access to digital technologies between women and men. When looking at more sophisticated forms of access, such as the share of women in tech companies as entrepreneurs, founders of startups, and business leaders, or in computer science and engineering education careers, however, there is considerable room for improvement.[7] For example, women represent less than half—between twenty and forty percent—of the workforce in telecommunications and other information and communications technology (ICT) activities in all ASEAN countries where data is available. Moreover, across ASEAN, women entrepreneurs tend to own and manage small businesses, which are less reliant on digital technologies, as mentioned above.

In a region where the digital economy has grown very rapidly and where the pandemic has already disproportionately affected women, it is particularly important to narrow the gender digital divide to promote diversity, inclusive economic development, and

[5] Sachin Chitturu, Diaan-Yi Lin, Kevin Sneader, Oliver Tonby, and Jonathan Woetzel, "Artificial Intelligence and Southeast Asia's Future," McKinsey & Company, September 2017, https://www.mckinsey.com/~/media/mckinsey/featured%20insights/artificial%20intelligence/ai%20and%20se%20asia%20future/artificial-intelligence-and-southeast-asias-future.ashx.

[6] Cassey Lee, Dionisius Narjoko, and Sothea Oum, eds., SMEs and Economic Integration in Southeast Asia (Singapore: ISEAS Yusof Ishak Institute; Jakarta: Economic Research Institute for ASEAN and East Asia, 2019); Economic Research Institute for ASEAN and East Asia, "Study on MSMEs Participation in the Digital Economy in ASEAN: Nurturing ASEAN MSMEs to Embrace Digital Adoption," Economic Research Institute for ASEAN and East Asia, April 11, 2019, https://www.eria.org/uploads/media/Books/2019-October-ERIA-ASEAN-Study-On-MSMEs-Participation.pdf.

[7] Giulia Ajmone Marsan and Araba Sey, "Women's Participation in the Digital Economy: Improving Access to Skills, Entrepreneurship, and Leadership Across ASEAN," Economic Research Institute for ASEAN and East Asia, February 8, 2021, https://www.eria.org/publications/womens-participation-in-the-digital-economy-improving-access-to-skills-entrepreneurship-and-leadership-across-asean/.

innovation. For all these reasons, increased participation of women and girls in the post-pandemic digital economy has been identified by regional policy makers as a key pillar of the recovery as mentioned in the ASEAN Comprehensive Recovery Framework.[8]

Increasing Digital Risks

In addition to addressing the three digital "divides," ASEAN policymakers need to seriously consider the many risks associated with AI, big data analytics, and other emerging digital technologies. Many countries in the region are not yet equipped to tackle serious cybersecurity threats against individuals, consumers, and institutions. Privacy considerations regarding the collection and usage of data need careful debate and analysis of benefits and risks associated with different models and options both domestically and with respect to cross-border data flows. There is also very little knowledge on the way data used to train AI and machine learning algorithms may result in potential biases and discrimination affecting groups under-represented in the digital landscape, such as rural communities, women, and ethnic minorities. Investments in research and development (R&D) around AI and related technologies remain considerably low in most countries in the region, raising another barrier to solving these challenges.

Skills Development to Address Digital Divides and Risks

Skills development is crucial to give ASEAN economies the footing to succeed in the fast-growing digital economy. To address the rural, MSME, and gender digital gaps, ASEAN governments should invest in upskilling people affected most by these inequities. In rural areas, investments in digital infrastructure combined with training and skills development of the population will be key in the post-pandemic phase to make economic recovery less uneven. At the same time, targeted investments to train MSME leaders and increase female representation will sharpen ASEAN's competitive edge.

In addition to skills development, digital education and literacy is also key to addressing AI and cyber risks. Better digital skills are not only important for economic recovery, entrepreneurship, and innovation, but are also crucial to address the emerging risks associated with AI and digital technologies more broadly. Investments in training for digital data literacy, increased awareness among the wider population of digital environments, and even basic understanding of how data is harvested and how AI algorithms work are key elements of any digital education seeking to empower people to effectively harness new technology. These are also issues that policy makers should consider to combat the misuse and popular skepticism of technology. Policy initiatives should include dedicated programs to raise awareness and tackle threats as diverse as fraudulent transactions in e-commerce, breaches in privacy and misuse of personal data, discrimination arising from biases contained in big data sets and AI, and identification of fake news coming from unreliable sources in the digital sphere.

[8] ASEAN, "ASEAN Comprehensive Recovery Framework and Its Implementation Plan," ASEAN, November 12, 2020, https://asean.org/asean-comprehensive-recovery-framework-implementation-plan/.

Further Steps: Increased ASEAN Public-Private Coordination

ASEAN governments can also build on existing policies to increase cooperation and integration in three key areas. The first step is increasing interagency collaboration among different ministries and policy departments. Ministries in charge of skills development and training should work in concert with government departments dealing with innovation, infrastructure development, social, and economic issues. Second, governments should also make efforts to engage higher education and the private sector. The level of public and higher education in many ASEAN countries still lag behind more advanced economies. To address this, some ASEAN countries have begun experimenting with international agreements to connect national higher education systems with foreign entities with the aim of increasing the quality of education and training, with a focus on digital upskilling and reskilling. This is an important mechanism and should be expanded further. ASEAN policymakers should also consider policies that attract and retain highly skilled digital professionals. The newly established Singaporean Tech. Pass, a work visa scheme aiming to attract up to five hundred foreign tech experts to the city state, has just been implemented and can provide a useful policy example to other countries in the region.

Finally, together with educational institutions, the private sector has an important role to play when it comes to skills development for more inclusive digital economies. Partly to tackle the lack of cutting-edge higher education and training to provide digital-related skills in the population, interesting public-private partnerships are emerging across ASEAN. These have been catalyzed by the pandemic. While many countries were implementing social-distancing measures and recommending citizens to "stay home," several domestic and foreign tech champions have proactively developed initiatives with the support of national governments, local universities or regional entities, such as the ASEAN Secretariat, to train individuals to go online and support previously disconnected MSMEs in marketing and selling products online through e-commerce platforms and social networks. Some of these initiatives specifically target groups of individuals that are traditionally less connected, lack digital-related skills, and are more affected by the emergence of the above-mentioned "divides," such as people in rural areas and women entrepreneurs.

Conclusion

The COVID-19 pandemic has accelerated the already rapid growth of the Southeast Asian digital economy. This acceleration is bringing many opportunities to citizens, firms and societies at large while also favoring certain groups more than others. Policymakers need to monitor and address the emerging digital divides—between urban and rural, larger firms and MSMEs, men and women—to promote inclusive post-pandemic digital economies. One of the most effective ways to promote inclusion is to equip vulnerable groups in the population with adequate skills to be able to compete and thrive in the post-pandemic future.

Investments in connectivity and infrastructure alone are not enough. They should be combined with skills development programs to make sure that MSME workers and people living in less connected rural areas not only have access to technology, but also have the knowledge to use technology in a meaningful way. Investments in skills development programs should also benefit women and girls to ensure greater representation in science and engineering careers and leadership positions. Finally, individuals need to be empowered by increased education to be equipped with the knowledge to understand the risks and reject biases associated with digital technologies including AI.

These different steps must include integrated and collaborative approaches across different ministries and policy departments and across different actors of the digital ecosystem. Government institutions together with the business sector, education and training organizations, and civil society collectively have an important role to play in shaping the digital development of the region and to foster inclusion in the digital economy.

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